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A study on utilization of electricity subsidy among farmers in Tamil Nadu

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Abstract
Agricultural input subsidies are the most critical aspect of India's food and agriculture policy regime, requiring a steadily larger budget share. All of these subsidies, reducing the prices of inputs served in the initial stages of green revolution, as incentives to the farmers for adopting new technologies and undertake risks in farming. However, these subsidies have contributed to environmental costs in terms of reduced public investment in agriculture on account of the erosion of investible resources, and wasteful use of scarce resources like water and power. The results revealed that most of the farmers in the study area were utilizing both submersible pump sets and canal water for irrigation purpose. It is also found that, there exists greater inequality in access to electricity subsidies across farm size groups in different agro-climatic zones of Tamil Nadu. More than 50 per cent of the farmers in the study area are ready to pay electricity bills, if they are provided with uninterrupted power supply. It is also suggested that the government can impose flat rates on electricity supply to the agricultural sector. This may reduce the state electricity board's burden and can enhance the efficiency and production of more electricity. Government should also keep aside its motive to please voters and frame rational policy for the welfare of the state.

Keywords: electricity subsidy, farm size, power supply

Introduction
Subsidies are a potent lever in agriculture, employed all over the world. The fulcrum of farming practices in many regions of India is state subsidies in their various guises. The input subsidies and technology are the two significant factors for the development of agriculture in India. For stimulating agricultural growth, both central and state governments are providing both direct and indirect subsidies to the producers including electricity, canal water, drip irrigation, fertilizers and micronutrients, etc. so as to enhance agricultural productivity and income, and to reduce risks in farming.

Agricultural electricity subsidies act as a tool to increase agricultural production through enhanced groundwater irrigation and to benefit rural households and stabilize food prices. Subsidies on fertilizers, electricity and canal water accounted for bulk of the subsidies. In 1999–2000, the electricity subsidy accounted for 53 per cent; fertilizer subsidy, 28 per cent; and canal irrigation subsidy, 19 per cent. India is the fifth largest country in the world in terms of expenditure on energy subsidies accounting to US$20 billion on oil products, natural gas and electricity subsidies (UNEP, 2008).

Following the introduction of agricultural electricity subsidies, the net irrigated area had increased from 21 million hectares in 1950-51 to 68.2 million hectares in 2016-17 (Annual Report, GOI, 2016-17). At present, government of Tamil Nadu is providing electricity to the farmers at full subsidy rate resulting in a heavy financial burden on Tamil Nadu State Electricity Board (TNEB), besides causing groundwater overexploitation. The water being supplied to the farmers for irrigation purpose is free of cost.

The subsidies granted for fertilizers, irrigation and power as subsidies on non-merit economic services is to help the farmers to reduce the production cost. But the fact is that large farmers are getting more benefits from these subsidies than that of small farmers, who already have the capacity to purchase the inputs. This paper attempts to access the utilization of agricultural electricity among different categories of farmers in Tamil Nadu.

Review of literature
Mukherji *et.al*. (1990) [4] examined the economics of electricity subsidy in West Bengal. It was found that electricity subsidies benefited only large farmers than that of the small size category

farmers. The author suggested that electricity subsidy should be given to small size category farmers only.

Gulati and Sharma (1997) stated that electricity subsidy had the higher growth rate among all the agricultural input subsidies. The small farmers had appropriated a higher amount of subsidies, but it was not encouraging inter personal and regional equity. They mentioned that increasing subsidies on continuous basis were giving wrong signal to farmers altered their production and led to degradation of environmental resources.

Howes and Murgai (2002) [3] examined the distribution pattern of electricity subsidy in Karnataka. The results revealed that per unit of electricity subsidy benefited the large farmers when compared to marginal and small size category farmers. On an average, large farmers who own irrigation pump sets received Rs. 29,000 subsidy per year while the marginal and small land holders received subsidy of approximately Rs. 3,000 per year.

Jain (2003) [6] studied the existence of disparities in the flow of agricultural electricity subsidy between the progressive and backward areas. He found that the proportion of farmers having electricity connections in the progressive areas was 51 per cent higher than the backward areas. He also observed that the provision of electricity subsidy showed a negative impact on the depletion of underground water.

Acharya and Jogi (2004) found that the provision of irrigation and electricity at concessional rates had lead to inefficient use of scarce resources and distorted inter- temporal resource allocation and inequities. He suggested that imposing charges on power and canal irrigation would improve the use of natural resources efficiently. He also suggested that government should increase the investment in the power sector to improve the quality and quantity supplied thereby improve the quality of service.

Pachauri (2006) [5] pointed out that the announcement of free electricity to farmers of Punjab at the time of election has imposed additional financial burden on the government. However, the free power supply to the farmers leads to installation of inefficient pump sets and wastage of energy for a given output. He suggested that a strong policy to install power stations is a pre-requisite and urged the central government to put an end to the politicians promising electricity freebies to the farmers which has not remained the demand of the farmers.

From the above reviews, it is evident that agricultural subsidies create lopsided incentive systems thereby contributing for unequal distribution of its welfare impacts. At present, Government of Tamil Nadu is providing free electricity to the farmers of the state. The fact is that electricity subsidy is being distributed to all farmers besides their farm size. But, the benefits of freebies are enjoyed by the large and rich farmers, as the small farmers are not covered due to their non-possession of electricity connection.

Research gap

From the above review of literature, it is clear that past studies were done on the importance of agricultural subsidies, its utilization and impact on production. But, there was hardly any research done on identifying the equity implications of electricity subsidies under Indian context. Hence, the present paper addresses the issue of inequality in access to electricity subsidy among different categories of farmers.

Methodology

The study was carried out in 4 Agro- Climatic Zones of Tamil Nadu namely, Western Zone, North Eastern Zone, Cauvery Delta Zone, Western Zone. Two highly subsidized district each from two Agro- Climatic Zones and two least subsidized districts from another two Agro- Climatic Zones were selected based on the preliminary data gathered from Agriculture Directorate, Chennai.

The respondent farmers were selected for the study using multi- stage random sampling method. Two blocks from each district were randomly selected for the study. The data are gathered from 320 respondent farmers through pre- tested and structured questionnaire.

Percentage analysis was done to know the distribution of farmer's income and source of irrigation facilities to crops among the different farm size groups. ANOVA (Analysis of Variance) was carried to find out the inequality in access to agricultural electricity subsidies across farm size groups across four agro-climatic zones. Chi- square test (χ^2) was calculated to know the willingness to pay bills if uninterrupted electricity is provided to the farmers.

Results and Discussion

Distribution of farm income among farmers in Tamil Nadu

Tamil Nadu Government is providing free electricity to the farmers of Tamil Nadu through Tamil Nadu State Electricity Board (TNEB). This is quite compelling to know the impact of the electricity subsidy on farmers. Per year distribution of agricultural income among sample farmers is shown in the Table 1.

Table 1: Distribution of Farm Income among Farmers in Tamil Nadu

Income Level	Marginal	Small	Medium	Large	Total
Less than 2 Lakh	106(84.13)	32(31.37)	0(0.00)	0(0.00)	138(43.13)
2-3 Lakh	20(15.87)	50(49.02)	16(24.24)	0(0.00)	86(26.88)
3-4 Lakh	0(0.00)	20(19.61)	40(60.61)	8(30.77)	68(21.25)
Above 4 Lakh	0(0.00)	0(0.00)	10(15.15)	18(69.23)	28(8.75)
Total	126(100.00)	102(100.00)	66(100.00)	26(100.00)	320(100.00)

The figures in the parentheses are percentage to total

Out of total 320 farmers, 43.13 per cent of farmers were getting their farm income of less than 2 lakhs per year, 26.88 per cent between 2-3 lakhs per year, 21.25 per cent between 3-4 lakhs per year and 8.75 per cent between above 4 lakhs per year. Majority (84.14 %) of marginal farmers were earning less than 2 lakhs per year, 49.02 per cent of small farmers between 2-3 lakhs per year, 60.61 per cent of medium farmers between 3-4 lakhs per year, whereas most of the large farmers (69.23 %) earned above 4 lakhs income from agricultural sector.

Distribution of irrigation types among farmers in Tamil Nadu

At present, farmers are using various types of irrigation facilities for crop cultivation. *Table. 2* show the distribution of various irrigation types among different classes of farmers.

In the study area, majority of the total farmers (31.88 %) were using both submersible pump set and water canal for irrigation, followed by water canal (29.69 %), tank (16.56 %), submersible pump set (10.94 %), submersible pump set and tank (10.31 %) and submersible pump set, tank and water canal (0.63 %). It is also observed that, maximum number of submersible pump sets is used by large farmers (53.85 %), water canal by marginal farmers (42.06 %), tank by marginal farmers (26.19 %), submersible pump sets and water canal by medium sized farmers (65.15 %), submersible pump sets and tank by medium sized farmers (13.64 %) and Submersible Pump set, Tank and water canal by only medium farmers (3.30 %). It is observed that, only marginal and small farmers (7.89 %) are using submersible pump sets as they are unable to afford the expenditure incurred for submersible pump sets due to low income levels.

Table 2: Distribution of irrigation types among farmers in Tamil Nadu

Particulars	Marginal	Small	Medium	Large	Total
Submersible Pump set	5(3.97)	4(3.92)	12(18.18)	14(53.85)	35(10.94)
Water Canal	53(42.06)	42(41.18)	0(0.00)	0(0.00)	95(29.69)
Tank	33(26.19)	20(19.61)	0(0.00)	0(0.00)	53(16.56)
Submersible Pump set and water canal	20(15.87)	29(28.43)	43(65.15)	10(38.46)	102(31.88)
Submersible Pump set and Tank	15(11.90)	7(6.86)	9(13.64)	2(7.69)	33(10.31)
Submersible Pump set, Tank and water canal	0(0.00)	0(0.00)	2(3.03)	0(0.00)	2(0.63)
Total	126(100.00)	102(100.00)	66(100.00)	26(100.00)	320(100.00)

The figures in the parentheses are percentage to total

During the survey, it was reported that there exist intermittent power supply which reduced the efficiency of irrigation mainly for water intensive crops. Most of the farmers in the study area are ready to pay the electricity bills, provided the supply of electricity is regular.

Table 3: Farmers Willingness to pay Electricity bills for uninterrupted Power Supply

Particulars	Marginal	Small	Medium	Large	Total
Those who want to pay	85	59	52	18	214
Those who do not want to pay	41	43	14	8	106
Total	126	102	66	26	320

Chi- Square (χ^2) value – 8.069** df = 3

** *Significant at 5 per cent level*

From the Table 3, it is revealed that out of 320 sample farmers in the study area, 214 farmers were ready to pay bills whereas 106 farmers are against bill payments. The χ^2 value of 8.069 is significant at 5 per cent level shows that majority of the farmers in the study area were ready to pay electricity bills, if supplied uninterrupted.

Inequality in access to agricultural input subsidies

The study aims to analyze the inequality in access to agricultural input subsidies among different categories of farmers. Electricity subsidy plays an important role in the adoption of technology, crop choice and efficiency in sustainable use of the resources.

Table 4: Access to Electricity in Tamil Nadu

Across Farm Size	Mean (Rs./ha)	Standard Deviation	Co- efficient of Variation (%)	F- value
Marginal	941.31	284.42	30.22	36.56***
Small	1069.19	277.71	25.97	
Medium	1277.06	276.28	21.63	
Large	1323.02	206.96	15.64	
Across Zone				
WZ	1343.77	213.70	15.90	76.06***
NEZ	1309.02	119.57	9.13	
CDZ	1177.18	171.17	14.54	
SZ	780.60	222.33	28.48	

Note: *** - Significant at 1 per cent level

(**WZ**- Western Zone, **NEZ**- North Eastern Zone, **CDZ**- Cauvery Delta Zone, **SZ**- Southern Zone)

From the *Table 4*, it is found that across the farm size groups, the mean electricity subsidy per hectare is high among large farmers (Rs. 1323.02/ha) followed by medium farmers (Rs. 1277.06/ha), small farmers (Rs. 1069.19/ha) and marginal farmers (Rs. 941.03/ha). The variation within the marginal farmers is high (30.22 %) followed by small farmers (25.97 %), medium farmers (21.63 %) and large farmers (15.64 %).

The F-value of 36.56 calculated using 2-way ANOVA shows greater significance across the farm size groups. This significance value reveals that there exists greater inequality in access to electricity subsidy across different farm size groups.

It is also clear that, across the zones the mean electricity subsidy per hectare is higher in Western Zone (Rs. 1343.77/ha) followed by North Eastern Zone (Rs. 1309.02), Cauvery Delta Zone (Rs. 1177.18/ha) and Southern Zone (Rs. 780.60/ha). The variation of electricity subsidy within the Southern Zone is high (28.48 %) followed by Western zone (15.90 %), Cauvery Delta Zone (14.54 %) and North Eastern Zone (9.13 %).

The F-value of 76.06 calculated using 2- way ANOVA inferred that there exists greater significance across the zones. This significance value shows that there occurs greater inequality in access to electricity subsidy across the zones.

The high variation in electricity subsidy across the farm size groups and across the zones was due to less or no bore wells and non- possession of electricity connection in the study area. The fact is that electricity subsidy is being distributed to all farmers irrespective of their farm size. However, the large farmers in the study area are most benefited as major share of the electricity subsidy is utilized by them.

Conclusions & Suggestions

The study revealed that majority of the farmers (43.13 %) in the study area had their annual agricultural income of less than 2 lakhs. Most of the farmers 31.88 per cent of the farmers in the study area are using submersible pump set and canal water for irrigation purpose. And it is also evident that more than 50 per cent of the farmers in the study area are ready to pay electricity bills, if they are provided with uninterrupted power supply. There exists high variation in access to electricity subsidies across the farm size groups in various agro- climatic zones of Tamil Nadu. The electricity subsidy is regressive as large farmers in the study area have the capacity to pay the electricity charges thereby, getting more benefit from the subsidy than the small and medium farmers. The main reason is that they have more land, more electric load, new types of pump sets and more than one electricity connections.

As the farmers in the study area are ready to pay electricity bills for the interrupted power supply, the government can impose flat rates on electricity supply to the agricultural sector. This may reduce the state electricity board's burden and can enhance the efficiency and production of more electricity. Government should also keep aside its motive to please voters and frame rational policy for the welfare of the state.

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