

# Agricultural Subsidies in India: Case Study of Electricity Subsidy in Punjab State: An Analysis

RajwinderKaur\* and Dr. Manisha Sharma\*\*

\* Researcher (Student of Phd), Department of Economics, Punjabi University, Patiala (Punjab), India

\*\* Assistant Professor, Department of Correspondence, Punjabi University, Patiala.

**Abstract-** The Indian agrarian economy on the eve of independence was critical in situation. It could be characterized totally primitive, deteriorative and turbulent. During the British imperial regime, no pervasive and conductive measures were taken to boost the agriculture. The partition of country worsened the food situation in the country. This reduced the agricultural production and created difficulties both for food grains and commercial crops. The cultivators were under heavy debt and most of the holdings were uneconomic. In view of this, after independence tremendous efforts were made to boost the economy through agriculture as one of the tools for development. On the recommendations of food grain price committee (Jha Committee), the Government of India started the scheme of subsidies on purchase of various agriculture inputs to facilitate the farmers (Singh, 1994). This paper tries to analyse the impact of free electricity to Punjab farmers on various aspects of economy like Punjab State Electricity Board, Punjab Government and farmers etc. The empirical results reveal that farmers are ready to pay bills for irrigation as uninterrupted supply of electricity is given to agriculture sector. As a result, government should impose flat rates on electricity supply given to agriculture sector. Government should keep aside its motive to please voters or strengthen the vote bank, it should frame rational policy in the favour and welfare of the state.

**Index Terms-** Agriculture, Cultivators, Production, Electricity Subsidy.

## I. INTRODUCTION

Agricultural development is a condition precedent for the overall development of the economy. A progressive agriculture serves as a powerful engine of economic growth. In view of this, after independence tremendous efforts were made to boost the economy through agriculture as one of the tools for development. The Government of India adopted a positive approach and hence a well-defined policy of integrated production programmes with defined targets and a proper distribution programme was adopted along with other measures for the overall economic development of the country. Since the mid-sixties India has been using a new technology in agriculture. The new agricultural technology was in the form of a package programme which included the use of high yielding varieties of seeds, assured irrigation, chemical fertilizers, insecticides and pesticides and machinery (Government of India, 1994- 95). Indian farmers being poor are not in a position to buy these expensive inputs. Then India started the scheme of subsidies on

purchase of various agriculture inputs to facilitate the farmers (Singh, 1994).

In India, at present, centre as well as state governments are providing subsidies on fertilizers, irrigation (canal water), electricity and other subsidies to marginal farmers and farmers' cooperative societies in the form of seeds, development of oil seeds, pulses, cotton, rice, maize and crop insurance schemes and price support schemes etc. Out of these subsidies, at present, the central government pays subsidies to the farmers on the purchase of fertilizers. Fertilizers are an important component of agricultural technology. Whereas initially organic fertilizers were mainly used in the fields, however, chemical fertilizers have played a very important role in enhancing the agricultural production. To ensure availability of fertilizers to farmers at affordable prices, the government of India provides huge subsidies to fertilizers manufacturing industry from 1977. Hence, the government of India provides indirect subsidies to farmers for the purchase of fertilizers (State Environment of Punjab – 2005)

Many years ago, the function of state governments was mainly to maintain law and order in the country and to protect it from foreign invasion. So far as the economic affairs of the country were concerned, a complete laissez faire policy was followed. However, the situation has changed now. The concept of welfare state has taken deep roots. The central government encouraged the strategy of enhancing food grains production in states, particularly wheat and rice, for meeting the emergent food demand in the country. Punjab state leads other states in terms of contribution of wheat and rice to central pool (Karnik, 1996).

For the development of agricultural sector, at present, Punjab Government is giving subsidy on electricity as well as on irrigation. Energy in the form of electricity plays a key role in performance of agricultural sector, in Punjab as it is used in pumping ground water for irrigation purposes. At present government of Punjab is giving electricity to Punjab farmers, free of cost, through Punjab state electricity board, now is unbundled into Punjab state power cooperation limited and in Punjab state transmission cooperation limited (Government of Punjab, Punjab State Electricity Board). The water being supplied to the farmers for irrigation purpose is free of cost. It is quite difficult to estimate the values of this water being supplied to agriculture sector, therefore, total amount of subsidy on this account could not worked out on actual basis (Government of India, Pricing water policy, 2010).

The tariff structure of Punjab State Electricity Board (now is unbundled in Punjab State Power Cooperation Limited (PSPC Ltd) and Punjab state Transmission Cooperation Limited (PSTC Ltd)) is built on principles of cross subsidization with certain

categories of consumers (commercial and large industry) subsidizing other categories (agricultural pump sets and domestic). The tariff for agricultural pump sets is quite low till 1996-97. But in February 1997, the power supply to agricultural pump sets is made free. In the 'Election Manifestos' issued by the Shiromani Akali Dal and Indian National Congress Committee (I) Punjab issued from time to time before the elections, the electricity supply to the Agricultural Pump sets (AP) consumers in the State is given free of cost from 14.2.1997 to 31.3.2002 by Punjab Government leading by Shiromani Akali Dal (Badal) and again the then Chief Minister of Punjab, of Indian National Congress Committee (I), Capt. Amarinder Singh announced the subsidy in the shape of free power to farmers in Punjab from 15th August, 2005 'Indian Independence day' which is still continued.

In addition, the free electricity supply has also been given to some domestic consumer's i.e. Scheduled Caste (SC) domestic consumers, having connected Load of 300/500 watts. The Punjab Government, later on, also decided to give free electricity supply up to 200 Units per month to Non Scheduled Caste/Below Poverty Line (SC-BPL) domestic consumers (DS) with connected load up to 1000 watts with effect from December 1, 2006. These facilities have been allowed by the Punjab Government by way of giving Subsidy to the consumers through Punjab State Electricity Board.

In this paper, an attempt is made to analysis the electricity subsidies given by Punjab government to agriculture sector. The following section presents a review of related literature. The next section describes the methodology used for analysis. The succeeding section briefly reviews the electricity subsidy given to Punjab farmers, cost of production, sale of electricity to agriculture sector, financial position of Punjab State Electricity Board (PSEB) and fiscal deficit of Punjab Government and the next section deals with primary survey in Punjab state. The last section gives the conclusion and policies suggestions of the study.

## II. REVIEW OF LITERATURE

An attempt is made to analyse the nature of the work done during the past in the related field. Mukherji, (1990) tried to examine economic of electricity subsidy in West Bengal. He has conducted a study to describe the electricity subsidy in West Bengal. The author found that electricity subsidies benefit only big farmers than that of the small size category farmers. The author suggested that electricity subsidy should be given to small size category farmers only. Howes, (2002) tried to examine the distribution pattern of electricity subsidy and conducted a study to show the distribution pattern of electricity subsidy in farmers of Karnataka State. The author concluded that electricity subsidies are regressive because large size category farmers are much more likely to have pump sets than small size category farmers and because large size category farmers with pumps use more electricity than small size category farmers with pumps. The author suggested that electricity subsidy should be given to only small size category farmers.

Pachauri, (2006) pointed out that past election, Punjab has announced to implement the provision of free electricity for farmers and for some other sections like scheduled caste and below poverty line consumers. This policy of free electricity is

imposing additional financial burden on the Punjab Government. However, free power to farmers, leads to installation of inefficient pump sets, which use excessive energy, wastage of energy, for given output. Therefore, if India has to attain a level of economic success globally, then a strong policy to install power stations is an essential pre-requisite and urged the Prime Minister of India putting an end to politicians promising free electricity to the farmers which has not remained a demand of farmers.

Jain, (2006) made an attempt to analyse the provision of agricultural subsidies, which have burdened Punjab's exchequer heavily. This study highlighted the existence of disparities in the flow of electricity subsidy between the progressive and backward areas. The author conducted a primary survey in two districts viz. Mansa and Ludhiana to make a comparative study of the flow of electricity subsidy to different classes of the farmers. The results showed that the proportion of farmers having electricity connections in the progressive area was 51 per cent higher than the backward areas. The author also observed that the provision of electricity subsidy has a negative impact on the sustainability of agriculture as it has implications for depletion of underground water. On the basis of this evidence, the author put forward the case for user charges-based open access to electricity to speed up the pace of economic development of an agro-based economy as this policy, apart from bringing hope for the sustainability of the electricity utility, will ensure enough economic returns to the farmers depended on non-electrical means of irrigation.

From the above, it may conclude that to accomplish integrated rural development, a substantial amount of energy is required for various activities. Electricity is, at present, perhaps the most efficient and convenient sources of this energy. But the Indian Power Sector is struggling with formidable difficulties to meet with the heavy demands of electricity due to higher amount of power losses.

At present, Government of Punjab is giving free electricity to Punjab farmers. Some politicians are in favour and some are against it. But it is true that electricity subsidy is being given to all the farmers without keeping in view the level of farmers. While the benefit of free electricity is being enjoyed by the big and rich farmers, the small and poor farmers are not covered due to their non-possession of electricity connection. Further, this policy is imposing additional financial burden on Punjab Government.

## III. NEED OF THE PRESENT STUDY AND OBJECTIVES

The electricity subsidy is often criticized for their financial burden. Some researchers assert to the extent that these should be withdrawn, such a step will reduce the fiscal deficit, improve the efficiency of resources use, funds for public investment in agriculture. On the other hand, there is a fear that income of farmers would decline if electricity subsidy is curtailed. These are very important issues, which need serious investigation. Following are the main objectives of this study:-

1. To study the current status of power sector in Punjab.
2. To analyse free electricity to Punjab farmers.
3. To study the impact of free electricity to Punjab farmers.
4. To suggest ways and means for giving free electricity to Punjab farmers in future.

#### IV. METHODOLOGY

The present study is based on primary as well as secondary data. The districts of Punjab have been divided into three regions on the basis of levels of agricultural productivity. Average productivity is estimated by aggregation of the output of ten major crops of the state for the year 2006-07. Keeping in view the differences in agro-climate conditions and to avoid the geographical contiguity of sampled districts, it is deemed fit to select Ludhiana from high productivity zone, Bathinda from medium productivity zone and Rupnagar from low productivity zone. There are six tehsils of Ludhiana, three tehsils of Bathinda and Rupnagar each. Following random sampling, one village from each tehsil is selected, thus twelve villages are

selected from three districts. Sampled farmers have been divided into three categories on the basis of their farm size, small size category farmers are those who own land up to five acres, medium size category farmers own land between five to ten acres and large size category farmers own land above ten acres. A detailed questionnaire is prepared for collecting information about the agriculture subsidies. Standard statistical tools like chi-square, percentages have been used while carrying out tabular analysis.

In addition to primary data, secondary data is used in this study. The main sources of secondary data are Punjab State Electricity Board, Statistical Abstract of Punjab, Economic Survey of Punjab, Punjab Human Development Report, Punjab State Electricity Regulatory Commission etc.

#### Hypothesis and Statistical Method

The hypothesis of the study is that “Punjab farmers are ready to pay bills if uninterrupted electricity supply is given to them”. The hypothesis has been tested by using chi-square :-

$$\text{Chi - square} = \frac{\sum (O_{ij} - E_{ij})^2}{E_{ij}}$$

$O_{ij}$  → Observed frequency of the cell in ith row and jth column.

$E_{ij}$  → Expected frequency of the cell in ith row and jth column.

The degree of freedom is:-

$$\text{d.f.} = (c-1)(r-1)$$

c - The number of columns.

r - The number of rows.

#### V. ELECTRICITY SUBSIDY IN PUNJAB STATE

Punjab State Electricity Board, which was constituted by the Government of Punjab in 1959 under the Electricity Act 1948, is a vertically integrated utility being responsible for generation, transmission and distribution of electricity within the State of Punjab. The majority of energy requirement of the state is met by generation at State's own three Thermal Plants, five Hydel Power Stations and State's share from Common Pool of Bhakra Beas Management Board (BBMB). Three Thermal Plants in Punjab are Guru Nanak Dev Thermal Plant (GNDTP) at Bathinda, Guru Gobind Singh Super Thermal Plant (GGSSTP) at Ropar and Guru Hargobind Thermal Plant (GHTP) at LehraMohabat. Five Hydel Power Stations are Shanan Power House at Joginder Nagar (HP), MukerianHydel Project in Hoshiarpur District, Anadpur Sahib Hydel Project in Ropar District, RanjitSagar Project, Micro Hydel Projects and Upper Bari Doaba Canal (UBDC) Hydel Project.

The distribution of free electricity to Punjab farmers during 1996-97 to 2010-11 is shown in the table 1. This table reveals that subsidy of electricity has increased from Rs. 404 crores in 1996-97 to Rs.1,219 crores in 1999-00 and further increased to Rs.3,487 crores in 2010-11.

**Table 1: Distribution of Free Electricity to Punjab Farmers during 1996-97 to 2010-11**

Years	Amount of Subsidy (Rs. Crores)
1996-97	404
1997-98	604
1998-99	928
1999-00	1,219
2000-01	1,462
2000-01	1,862
2005-06	1,386
2006-07	1,768.86
2007-08	2,159.84
2008-09	2,294.90
2009-10	2,804.94
2010-11	3,487

Source:- PSPCL, Petition for Aggregates Revenue Requirement and Determination of Tariff for the FY 2011-12

As the year 2000-01 is compared to the year 1996-97, it is observed that this subsidy has increased by 3.62 times more and in 2010-11, this has risen up by 2.52 times more as compared to the year 2005-06.

**VI. FINANCIAL POSITION OF PUNJAB STATE ELECTRICITY BOARD**

The Punjab State Electricity Board (PSEB) is a Commercial Organization. Therefore, it is necessary to discuss about the financial position of PSEB. In brief, as per data, the financial position of the Board is not up to the mark, mainly due to the reasons that on one side the PSEB is generating the electricity by spending huge money and on the other side, supplying the electricity on lower rate and even free of cost to some sections of consumers. In addition, to meet with the requirement of the consumers, after purchasing the electricity at higher rate, the same is being given to agriculture pump sets as well as other small domestic consumers on free of cost. The revenues gap of Punjab State Power Cooperation Limited during 1996-97 to 2010-11 is shown in the table 2. The revenue surplus has declined from Rs. 108 crores in 1996-97 to Rs. 49 crores in 1997-98 and further declined to Rs.4 crores in 1999-00.

**Table 2: Revenue Gap of Punjab State Power Cooperation Limited during 1996-97 to 2010-11**

Year	Revenue Gap/ Surplus
1996-97	108
1997-98	49
1998-99	51
1999-00	4
2000-01	-32
2001-02	-31
2002-03	-352.73
2003-04	-164.9
2004-05	-618.6
2005-06	13
2006-07	-1,92.3
2007-08	-1,189.77
2008-09	-1,366.45
2009-10	-1,978.05
2010-11	-5,427.72
2011-12	-9,656.53

Source:-PSPCL, Petition for Aggregates Revenue Requirement and Determination of Tariff for the FY 2011-12.

The revenue gap has increased from Rs. 32 crores in 2000-01 to Rs.352.73 crores in 2002-03 and further increased to Rs.9, 656.53 crores in 2011-12.

**VII. COST OF GENERATING POWER IN PUNJAB STATE**

PSEB is producing the electricity by spending huge amount of money as well as due to higher demand of electricity, also purchasing the power from other traders. The average cost of power as well as purchasing cost from traders during 2006-07 to 2009-10 is shown in the table 3. This table indicates that generation as well as purchasing cost is increasing throughout the study period. Average generation cost has increased from Rs.3.39 per unit in 2006-07 to Rs.3.67 per unit in 2008-09 and further increased to Rs.4.01 per unit, whereas average purchasing cost increased from Rs.4.85 per unit in 2006-07 to 6.21 per unit in 2008-09 and further increased to Rs.7.33 per unit in 2009-10.

**Table 3: Average Cost of Power Generation and Average Cost of Power Purchased during 2006-07 to 2009-10**

Years	Average Generation cost per unit (In Rs.)	Average Purchase cost per unit from Traders (In Rs.)
2006-07	3.39	4.85
2007-08	3.53	5.74
2008-09	3.67	6.21
2009-10	4.01	7.33

Source: PSPCL, Petition for Aggregates Revenue Requirement and Determination of tariff for the FY 2011-12.

It is observed that the cost of purchasing power is higher than that of generation of electricity. The purchasing cost is near about two times as compared to generation cost during 2007-08 to 2009-10.

**VIII. DISTRIBUTION OF ELECTRICITY TO PUNJAB FARMERS**

PSPCL is providing the electricity to various categories like industrial, agriculture, domestic etc. It is economically important to find out the percentage share of agriculture sector in total sale of electricity. Total sale of electricity and sale to agriculture pump sets during 2007-08 to 2011-12 is shown in the table 4. In 2007-08, total sale is 31540 Million Units (MU), out of which 9537 MU sold to agriculture pump sets, whereas in 2010-11, total sale is 33432 MU out of which 10989 MU sold to agriculture pump sets.

**Table 4: Distribution of Energy according to sale to Agriculture Pump Sets during 2007-08 to 2011-12**

Sr. No.	Particulars	2007-08	2008-09	2009-10	2010-11	2011-12
1.	Total sale (in MUs).	31,540	33,315	32,350	33,432	36,165

2.	Energy sales to agriculture consumers (in MUs).	9,537 (30.24)	10,014 (30.06)	10,505 (32.47)	10,898 (32.6)	12,253 (33.88)
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Source: PSPCL, Petition for Aggregates Revenue Requirement and Determination of Tariff for the FY 2011-12. Percentage share is shown in parentheses.

The above table reveals that the percentage share of sale of electricity to agriculture pump sets has increased from 30.24 in 2007-08 to 32.47 in 2009-10 and further increased to 33.88 in 2011-12.

#### IX. FINANCIAL POSITION OF STATE GOVERNMENT

At present, Government of Punjab is giving various schemes to the people of the State. The main reason is to improve the living standard of the People, whereas the financial status of Government of Punjab, it is not up to mark. Government of

Punjab is in revenue deficit from 1996. The financial position of Punjab State government during 1996-97 to 2010-11 is shown in the table 5. The fiscal deficit of Punjab government has increased from Rs.1, 464.68 crores in 1996-97 to Rs. 4,383.58 crores in 2006-07 and further increased to Rs. 6,690.45 crores in 2008-09, whereas subsidy to agriculture sector has also increased from Rs.404 crores in 1996-97 to Rs.2, 159.84 crores in 2007-08 and further increased to Rs.3,487 crores in 2010-11.

**Table 5: Financial Position of Punjab state government during 1996-97 to 2010-11**

Years	Fiscal Deficit (Rs. Crores)	Electricity subsidy(Rs.Crores)	Percentage share of electricity subsidy in Fiscal deficit
1996-97	1,464.68	404	27.58
2005-06	2,653.97	1,386	52.22
2006-07	4,383.58	1,768.86	40.35
2007-08	4,603.843	2,159.84	46.91
2008-09	6,690.45	2,294.9	34.30
2009-10	NA	2,804.96	-
2010-11	NA	3,487	-

Source: - (1) PSPCL, Petition for Aggregates Revenue Requirement and Determination of Tariff for the FY 2011-12. (2) Government of Punjab, Economic survey, various years.

The percentage share of subsidy in fiscal deficit has increased from 27.58 in 1996-97 to 52.22 in 2005-06 and declined to 40.35 in 2006-07 and increased to 46.91 in 2007-08.

per year is shown in the table 6. Out of total 235 farmers, 18.30 per cent are getting less than two lakhs, 25.96 per cent between two lakhs to three lakhs, 22.13 per cent between three lakhs to four lakhs and 33.62 per cent more than four lakhs. Majority (51.19 per cent) of small farmers are earning less than two lakhs, 48.48 per cent of medium farmers between 3 lakhs to four lakhs, whereas most (33.62 per cent) of large farmers above four lakhs income from agriculture sector.

#### X. IMPACT OF ELECTRICITY SUBSIDY ON PUNJAB FARMERS

Punjab Government is giving the free electricity to Punjab farmers through Punjab state electricity Board. It is important to find out the impact of this subsidy on farmers, then a primary survey is conducted in three districts of the same state. The distribution of farmers according to their income from agriculture

**Table 6: Distribution of Farmers in Punjab according to their Income**

Income Level	Small	Medium	Large	Total
Less than 2 Lac	43 (51.19)	0 (0.00)	0 (0.00)	43 (18.30)
2-3 Lac	39 (46.43)	22 (22.22)	0 (0.00)	61 (25.96)

3-4 Lac	2 (2.38)	48 (48.48)	2 (3.85)	52 (22.13)
Above 4 Lac	0 (0.00)	29 (29.29)	50 (96.15)	79 (33.62)
Total	84 (100)	99 (100)	52 (100)	235 (100)

Source: - Field Survey, 2010-11.  
Percentage share is shown in parentheses.

At present farmers are using various types of sources for irrigating their crops. Table 7 shows the distribution of farmers according to use of source of water to crops. This table reveals that the majority i.e. 58.72 per cent of total farmers are using submersible as well as diesel pump sets, 27.66 per cent are using submersible, diesel pump sets and water canal, 8.09 per cent used

submersible and canal water, 3.83 per cent has only submersible pump sets and only 1.70 per cent are using mono-block pump sets. This table reveals that maximum number (57.14 per cent) of small size category farmers, 57.58 per cent of medium and 63.46 per cent of large size category farmers are using submersible as well as diesel pump sets.

**Table 7: Distribution of Farmers according to Use of Source of Water to Crops**

Particulars	Small	Medium	Large	Total
Mono Block Pump set	4 (4.76)	0 (0.00)	0 (0.00)	4 (1.70)
Submersible Pump set	9 (10.71)	0 (0.00)	0 (0.00)	9 (3.83)
Submersible Pump set and diesel Pump set	48 (57.14)	57 (57.58)	33 (63.46)	138 (58.72)
Submersible Pump set and water canal	11 (13.10)	8 (8.08)	0 (0.00)	19 (8.09)
Submersible Pump set, diesel Pump set and water canal	12.00 (14.29)	34.00 (34.34)	19.00 (36.54)	65 (27.66)
Total	84 (100)	99 (100)	52 (100)	235 (100)

Source: Field Survey 2010-11

Note: Percentages are shown in parentheses

Submersible pump sets are very useful for irrigation purposes, the reason is that it produces more water than that of other pump sets. It is observed that few farmers (10.7 per cent) having less than 2 acres of land are using mono-block pump sets as they are unable to afford the expenditure of submersible as well as diesel pump sets due to the low income level.

During survey it is found that maximum numbers of farmers are using diesel pump sets for irrigating the crops. Large size category farmers are spending more on diesel pump sets as compared to small and medium size category farmers. The main reason behind it, is poor supply of electricity to agriculture pump sets. Comparing the diesel cost with the electricity charges even if the subsidy is withdrawn by Punjab Government, it is found that that of the diesel cost is higher than electricity charges (flat rate). The farmers are ready to pay the bills for electricity, at the condition that supply of electricity should be regular. Table 8

reveals that out of 235 total sampled farmers 172 farmers are ready to pay bills, whereas 63 farmers are against of bills.

To test the Hypothesis, chi-square test is applied.

**Table 8: Farmers Ready to Pay Bills if Electricity is Given Uninterrupted**

Particulars	Small	Medium	Large	Total
Those who do not want to pay	57	75	40	172

Those who want to pay	27	24	12	63
Total	84	99	52	235

Source: - Field survey, 2010-11

Value of chi-square = 1.92

Value of freedom = 2,  $\chi^2_{0.05} = 3.84$

The table value is greater than the calculated value. Hypothesis is accepted. Hence, Farmers are ready to pay bills if electricity is given to them uninterrupted.

#### XI. MAJOR FINDINGS AND POLICY IMPLICATIONS

This paper analysed the electricity subsidy in Punjab state during 1996-97 to 2011-12. The main purpose of this study is to help the farmers, so that they can use the new technology and reduce the cost of production. Secondary data reveal that Punjab State Government is giving free electricity to Punjab farmers through Punjab State Electricity Board. These both departments are in fiscal deficit and major share of income is going to for giving free electricity to agriculture sector. From primary survey it is observed that the income of farmers is depending on the agriculture. According to them, due to free electricity, cost of inputs on agriculture is reduced as compared to the previous years when free electricity was not given. The electricity subsidy is regressive as large farmers, who have capacity to pay the electricity charges are getting more benefit from this 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. Due to irregular supply of electricity farmers have to use diesel pump sets to irrigate the crops. The expenditure of diesel pump sets is very high as compared to flat rates of electricity.

From farmers point of view they are ready to pay bills for irrigation as uninterrupted supply of electricity is given to agriculture sector. As a result, government should impose flat rates on electricity supply given to agriculture sector. If implemented, it will reduce state electricity board's burden and this amount can be used for production of more electricity, reducing the need of purchasing electricity at very high prices, which adds to the deficit of state finance. Government should

keep aside its motive to please voters or strengthen the vote bank, it should frame rational policy in the favour and welfare of the state.

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#### AUTHORS

**First Author** – Rajwinderkaur, M.A, M.Com, B. Ed, MPhil, Pursuing Phd. in Economics, Department of Economics, Punjabi University, Patiala (Punjab), India.

Email-id- [rwkaur@gmail.com](mailto:rwkaur@gmail.com)

**Second Author** – Dr. Manisha Sharma, M.A, UGC, Phd., Department of Correspondence, Punjabi University, Patiala (Punjab), India.

Email-id- [manisha1971@hotmail.com](mailto:manisha1971@hotmail.com)

**Correspondence Author** – Rajwinderkaur, M.A, M.Com, B. Ed, MPhil, Pursuing Phd in Economics, Department of Economics, Punjabi University, Patiala (Punjab), India,

Email-id- [rwkaur@gmail.com](mailto:rwkaur@gmail.com), [rajwinder1102@gmail.com](mailto:rajwinder1102@gmail.com)