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AGRICULTURAL GROWTH AND SUBSIDIZED POWER SUPPLY – FARMER CONSUMER'S PERSPECTIVE

KEY WORDS: Agricultural Sector, Power, Electricity Production, Electricity Consumption, GDP.

Naveen, G.V Assistant Professor, Department of Studies and Research in Commerce, KSOU, Mysuru- 06.

ABSTRACT

There is a growing demand of electrical energy for agricultural usage requirements in India. Electrical Utilities of many states have been facing acute power shortage which led to unrest in the farmers in many states. It is observed in the last few decades, the underground water levels have been falling down drastically and cultivated area has been increasing by cutting the forests. Hence, there is growing demand for electricity consumption for the purpose of irrigation. The generation is not growing proportionately to the growing demand. On the other side, the available energy is also not properly utilized for Agricultural purposes. The farmers have to be educated in the area of energy conservation and effective utilization of available resources in the country. This paper highlights the role of power in agricultural development and throws light on review of literature with regard to farmers' perception on free farm electricity and groundwater extraction.

INTRODUCTION

India is mainly an agrarian nation with more than 60% of its population being reliant directly or indirectly on agriculture. The Indian agriculture sector has made considerable progress in the last few decades with its large resources of land, water and sunshine. India produces all main crops to reach the necessity of food, fodder, fiber, fuel and inputs for its agricultural industry. India is presently the world's largest producer of pulses and the second largest producer of rice and wheat in the world. The country is also the second largest producer of sugar, after Brazil. The Department of Agriculture and Cooperation under the Ministry of Agriculture, Government of India is the nodal organization responsible for the growth of the agriculture sector in India. The organization is accountable for formulation and implementation of national policies and programs intended at achieving quick agricultural augmentation through minimum utilization of land, water, and soil and plant resources of the nation.

Role of subsidized Power supply in India

India is the world's third largest producer and third largest consumer of electricity. The national electric grid in India has an installed capacity of 374.2 Gigawatt hours (GWh) as of 31 December 2020. Renewable power plants, which also include large hydroelectric plants, constitute 36.17% of India's total installed capacity. During the 2019-20 fiscal years, the gross electricity generated by utilities in India was 1,383.5 Terrawatt hour (TWh) and the total electricity generation (utilities and non utilities) in the country was 1,598 (TWh). The gross electricity consumption in 2019-20 was 1,208 Kilowatt hour (KWh) per capita. In 2015-16, electric energy consumption in agriculture was recorded as being the highest 17.89% worldwide. The per capita electricity consumption is low compared to most other countries despite India having a low electricity tariff.

India has a surplus power generation capacity but lacks adequate distribution infrastructure. To address this, the Government of India launched a program called "Power for All" in 2016. The program was accomplished by December 2018 in providing the necessary infrastructure to ensure uninterrupted electricity supply to all households, industries, and commercial establishments. Funding was made through collaboration between the Government of India and its constituent states.

The power sector exerts a critical influence on the performance of the agricultural sector in India as it influences farmers' access to and use of electricity for a variety of agricultural operations, Particularly for pumping groundwater

Review of Literature

The attempt has made to study the few research articles which are published in various journals of repute.

Bikash Chandra Dash and Sangita (2011) examined the impact of governance reforms on efficiency, equity and service delivery in order to identifying the factors responsible for the success/failure of reforms in the power sector in Orissa. It is found from their study that the success of reforms depends not on mere change of ownership from public to private. It depends on so many factors like to what extent the stakeholders involved in the process are benefited and how the institutions implement the policies in reality.

Elumalai Kannan (2013) Do Farmers Need Free Electricity? Implications for Groundwater Use in South India, The study analyses farmer's perception on free farm electricity and groundwater extraction based on survey data collected from two South Indian states, viz., Karnataka and Tamil Nadu. The study is impelled by lack of pragmatic substantiation on farmers' perception on free power and groundwater over use and its connection with public policy formulation. The study reveals that benefit from free electricity differed for different groups of farmers, and at the same time most farmers reported excess use of electricity leading to over-exploitation of groundwater. A high proportion of farmers did not want free electricity due to its poor quality and frequent power cuts, and hence expressed willingness to pay for its use.

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.

Avinash kishore et.al., (2002) in their research paper on power supply have stated that the last two decades have seen significant increase in groundwater irrigation, a shift fuelled by the use of energized pump sets. One –third of the power consumed in the electricity sector is used to achieve roughly 50 percent of irrigation needs from groundwater resources. This exponential rise in demand coupled with low realization has raised the amount of gross subsidy to agriculture to unmanageable proportions.

Raghu k (2004) in his research paper on 'free supply of power to agriculture ways to make the scheme successful' stresses that limiting consumption in agriculture is very critical in the successful implementation of free power supply to agriculture. In this elimination of big farmers and corporate farming from the free power supply, encouragement to farmers to save power and measures to improve pump sets efficiently are important. This scheme can be implemented only with the cooperation of the farmers. For this it it's very important to educate farmers and provide necessary technical training to the electricians in the villages. Participation on NGOs in all these activities also should be encouraged.This task should be taken up as a movement.

ElisabethIlskog (2010) in his research paper 'The Zanaibar Blackout- a case study on consequences from an electricity power crisis' highlight with increased dependency of electricity, the fundament for a more vulnerable society is also created. This is illustrated by the economic and social depression that hit Zanzibar during the breakdowns of the power system that occurred for one month in 2008 and for almost three months in 2009-10.

Mahedi Masuduzzaman (2012) in his research paper observes 'Electricity Consumption and Economic Growth in Bangladesh: Co- integration and Causality Analysis' the main goal of this paper was the examination of casual interdependences among economic growth, electricity consumption and investment in Bangladesh. For this purpose, the study focused on total electricity consumption, real GDP and investment for the period spanning from 1981 to 2011. Prior to testing for causality, the ADP/PP test and Johansen co-integration test were used to examine stationarity and long-run co-integration.

Rajwinderkaur and Manisha Sharma (2012) in their research paper 'Agricultural Subsidies in India'. Case study of Electricity Subsidy in Punjab State: an Analysis analyzed the electricity subsidy in Punjab State during 1996-97 to 2011-2012. 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 departments are in fiscal deficit and major share of income is going to for giving free electricity to agricultural 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.

Nitin Kumar et.al., (2013) in their research paper Analyses on Electrical Energy Consumption of Agricultural sector in Uttarkhand State measures to bridge between electrical energy required and consumed have to be taken on high priority to solve the power crisis in Uttarkhand. The given comparison of the total energy consumption and agricultural energy consumption depicts the pace of development in the state. It can be commented that the agricultural sector in the state has to be developed more in terms of technology inputs. It is not wrong if the energy consumption should be utilized in such an effective manner that maximum possible output is reaped and benefits harnessed.

Research GAP:

The above literature survey conducted by various researchers has revealed that the experts have made an attempt to focus on various aspects of agricultural sectors such as resource development an appraisal of Karnataka Electricity Board reforms in power sector (KEB), strategies to ensure unhindered supply of power the small and medium size industries etc., but none of them, they have focused on electrification of agriculture sector under reforms to ensure transmission of power to the agricultural sector without any hindrance.

Objectives of the study

- To outline the role of subsidized power supply in agricultural growth
- To study the farmer consumer perception towards subsidized electricity supply to agricultural sector.
- To study the growth of electricity production and consumption pattern of electricity.

Electricity Production in India

The power sector in India is mainly governed by the Ministry of Power. There are three major pillars of power sector these are Generation, Transmission, and Distribution. As far as generation is concerned it is mainly divided into three sectors these are Central Sector, State Sector, and Private Sector.

Table – 1 Electricity Production in India

Month	2015	2016	2017	2018	2019	2020
January	86479.52	92128.86	95690.06	101864.00	100848.84	103010.96
February	81204.45	89011.17	89285.92	91952.52	91419.66	101168.80
March	86337.81	96511.40	102000.73	105851.40	107135.57	96063.00
April	86695.05	99345.22	103159.76	103890.85	109263.40	81045.22
May	95401.76	99903.12	107294.92	111071.32	117046.96	96501.42
June	89907.55	97325.65	97524.88	104022.86	112946.84	100142.22
July	93141.73	94606.32	98106.69	102701.58	108407.55	108268.79
August	95120.32	95221.41	102673.44	105792.84	106200.23	103134.91
September	95741.00	98072.39	102495.50	108327.50	105194.50	110211.95
October	98631.08	99779.91	102879.97	113507.40	98908.98	107728.59
November	85905.93	93568.61	95482.87	99767.95	93665.89	95196.22
December	89626.43	95251.60	97020.31	100841.33	99098.13	103658.55
Total	1084192.6	1150725.66	1193615.1	1249591.6	1250136.6	1206130.63
%age Variation on total production	----------	6%	10%	15%	15%	11.25%

Source: Central Statistics Office

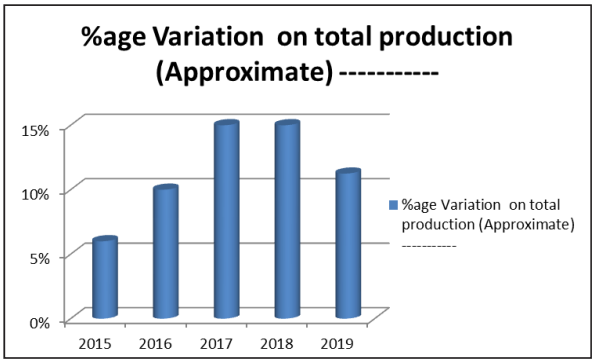

Figure 1: Electricity Production in India

Table- 1 explains the total electricity production in India from 2015 – 2020. In the year 2015 the total production was 1084192.60. It started increasing slightly every year till 2019. Compared to 2015 around 15% of electricity production was increased in the year 2018 and almost same in 2019. However, in the year 2020 from March to May production was decreased due to COVID- 19, therefore the total production was decreased to 11.25%.

Electricity consumption in agriculture sector in India

Agricultural power use stands at about 20 per cent of India's national consumption and is the third highest, after industry and household, as per the Power Ministry's statistics for 2009-10. The proportion of the farm sector's energy consumption has doubled since the 1970s while revenue realization to the electricity utilities has declined, as the tariff for agriculture is well below the economic cost.

Table – 2 Growth of electricity consumption in agriculture sector in India

Sl. No.	Plan/Year	Growth	% to Growth
1	1947	125	2.99
2	1950	162	2.89
3	1955-56 (End of the 1st Plan)	316	3.11
4	1960-61(End of the 2nd Plan)	833	4.96
5	1965-66 (End of the 3st Plan)	1892	6.21
6	1968-69 ((End of the 3 Annual Plans)	3465	8.37
7	1973- 74 ((End of the 4th Plan)	6310	11.36
8	1978-79 (End of the 5th Plan)	12028	14.32
9	1979-80(End of the 2nd Annual Plans)	13452	15.76
10	1984- 85 (End of the 6th Plan)	20961	16.83
11	1989- 90 (End of the 7th Plan)	44056	22.58
12	1991-92(End of the 2nd Annual Plans)	58557	25.33
13	1996-97(End of the 8th Plan)	84019	26.65
14	2001-02 (End of the 9th Plan)	81673	21.80
15	2006-07 (End of the 10th Plan)	99023	18.84
16	20011-12 (End of the 11th Plan)	140960	17.95
17	2016-17 (End of the 12th Plan)	191151	18.01
18	2017-18	199247	17.74
19	2018-19	213409	17.64
20	2019-20	228172	17.67
21	2020-21	262256	21.46
22	2021-22	276277	18.94

Source: India Electricity Production, 1987-2021 Data

Electricity consumption in agriculture sector in India is shown in table-2. Agriculture sector was reported 2.99% of consumption on the total production. Agriculture sector contributes about 15% of national GDP and more importantly about 50% of India's population depends on agriculture, therefore electricity consumption in agricluture sector has reached to 262256 GWh during 2020-21 around 21.46% of total electricity production is contributed to agriculture sector.it is estimated 18.94% of total production I.e., 276277 GWh during the period of 2021-22. Since it is backbone for emerging countries like India. Electricity production as well as consumption in agriculture sector is increasing tramenduosly.

Table-3 Descriptive computed from crosstab of farmer-consumers' gender and their perception of the implications of CESCO's farm power subsidy regime

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
Implication _ A	Male	417	1.90	.637	.031	1.84	1.96
	Female	83	4.48	.503	.055	4.37	4.59
	Total	500	2.33	1.142	.051	2.23	2.43
Implication _ B	Male	417	1.74	.546	.027	1.69	1.79
	Female	83	4.02	.765	.084	3.86	4.19
	Total	500	2.12	1.033	.046	2.03	2.21
Implication _ C	Male	417	1.74	.546	.027	1.69	1.79
	Female	83	4.02	.765	.084	3.86	4.19
	Total	500	2.12	1.033	.046	2.03	2.21
Implication _ D	Male	417	1.72	.534	.026	1.67	1.77
	Female	83	3.90	.759	.083	3.74	4.07
	Total	500	2.08	.998	.045	1.99	2.17
Implication _ E	Male	417	1.76	.571	.028	1.71	1.82
	Female	83	4.02	.811	.089	3.85	4.20
	Total	500	2.14	1.044	.047	2.05	2.23
Implication _ F	Male	417	1.78	.571	.028	1.72	1.83
	Female	83	3.78	.699	.077	3.63	3.94
	Total	500	2.11	.954	.043	2.03	2.20
Implication _ G	Male	417	1.94	.696	.034	1.88	2.01
	Female	83	4.29	.456	.050	4.19	4.39
	Total	500	2.33	1.096	.049	2.24	2.43
Implication _ H	Male	417	1.84	.626	.031	1.78	1.90
	Female	83	4.00	.698	.077	3.85	4.15
	Total	500	2.20	1.027	.046	2.11	2.29
Implication _ I	Male	417	2.04	.718	.035	1.97	2.11
	Female	83	4.07	.745	.082	3.91	4.24
	Total	500	2.38	1.046	.047	2.29	2.47

Table-3 reveals that male respondents agree with Implication I, namely, "The subsidy regime unintentionally helps to camouflage the incompetence of Escoms", with a maximum mean of 2.04. Females agree with Implication G, namely, "Escoms reduce their aggregate technical and commercial losses by ascribing a part of their losses to energy consumed by the farm sector" with a maximum mean of 4.29.

CONCLUSION

In India, farmers use electricity mainly for energizing irrigation pump sets to extract groundwater. The number of electric tube wells has increased tremendously over time with the availability of free electricity. The raise in tube wells needed more power connections which gradually affecting the economical condition of the state electricity boards. The propagation of tube wells has led to competitive extraction of groundwater by farmers with almost zero cost of pumping. The over-extraction of groundwater results in decrease of ground water tables and eventually leads to well failure. Further, the externalities of electricity subsidy are not equally shared by different sections of the farming community and accrue to those who have electricity connections to run the tube wells. From 2015 to 2019 electricity production in India Slightly increased. During COVID- 19 the production decreased 11.25% compared to 2015. Electricity consumption in agriculture sector in India is shown in table-2. Agriculture sector was reported 2.99% of consumption on the total production Agriculture sector contributes about 15% of national GDP and more importantly about 50% of India's population depends on agriculture, therefore electricity consumption in agriculture sector has reached to 262256

GWh during 2020-21 around 21.46% of total electricity production is contributed to agriculture sector. It is estimated 18.94% of total production I.e., 276277 GWh during the period of 2021-22.

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