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Development level of Electricity in Lawngtlai District, Mizoram

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Abstract:
Electricity use and access of regular power supply is strongly correlated with economic development of a country. The lacking regions are always backward in socio-economic development which led to social problems and inequality. The present study attempt to find out the development level of electricity in Lawngtlai District with the help of statistical techniques like Standardized Score, Factor Analysis and Principal Component Analysis by using Statistical Package for Social Scientists (SPSS). The disparity of electricity development find out at the level of village, intra and inter block. Inter and intra block level of development categorized into three such as high, medium and low from Z-Score techniques. The village level of development in the selected 20 villages also find out by using Principal Component Analysis and Factor analysis which categorized into five levels of very high, high, medium, low and very low. The present paper also finds that the central region, block centers and its adjacent areas of the district scores the high value whereas the remote and isolated villages scores the low value. It also finds that the reliability of power supply in the district is not sufficient for rural economic development. It clearly indicates that the rural areas of the study area requires improvement of power supply and its reliability to uphold the economy with the help of government intervention.

Key Words: Electricity, Development, Inequality

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I. INTRODUCTION:

Electricity is one of the most important blessings that knowledge has given to mankind. Unreliable energy supply has been a major obstacle of development. Connecting all households to the grid is likely to have an important effect on the economy as it provides a source of employment and promote industry. It is important to establish as much as possible about the demand for a reliable service of electricity so that investments can be effectively prioritized (Greenstone, 2014).

Reliability of electricity supply is important for economic growth and development that the present research focuses on identifying the electricity reliability and distribution of infrastructure. Achieving reliable, widespread and regular access to electricity will be transformative for many developing country's economy. It has significant effects on standard of living and allows to improve food production and conservation. It also help in purifying water and deeper wells, and better medical care. It enables educational development which reflects the societal value system.

The patterns of energy production and utilization reflect a great deal of subtle optimizing behavior, given the constraints faced by the economic actors (Barnes and Floor 1996; OTA 1991, 1992). Electricity use and access are strongly correlated with economic development (Stern, Burke and Bruns, 2019). Energy development, interpreted broadly to mean increased provision and use of energy services, is an integral part of enhanced economic development (Tomal and Jamelkova, 2003). Energy use per unit of output does seem to decline over time in the more advanced stages of industrialization, reflecting the adoption of increasingly more efficient technologies for energy production and utilization as well as changes in the composition of economic activity (Nakicenovic, 1996). Rural electrification may affect households' welfare and its regularity also influence the rural economy for small and cottage industries while the absence of regular access of power supply hinder the growth and development of rural livelihood.

II. HISTORICAL BACKGROUND OF THE STUDY AREA:

Lawngtlai village was established by Haihmunga Hlawncheu, a Lai Chief in 1880. When the five more districts were carved out from the already existing three districts in Mizoram, the name of this village was taken as one of the name of districts i.e., Lawngtlai district in 11th November 1998.

Prior to the arrival of the British in the late 19th century, the area which became Lawngtlai district was initially ruled by local chieftains. The Lushai Hills formed a part of undivided Assam since the pre-independence era and no regular administration set up in this region. The Lushai Hills District Council came to

be known as Mizo District as per the Lushai Hills District Act, 1954.Meanwhile, regional council called Pawi Lakher Regional Council (PLRC) was inaugurated on 23rd April 1953 and continued function till it was further trifurcated into three regional councils like Pawi Regional Council (PRC), Lakher Regional Council (LRC) and the Chakma Regional Council (CRC) on 2nd April 1972. The PLRC was the root from which the present three Autonomous District Councils of Mizoram evolved. With the attainment of the Union Territory status by the Mizo District 'Mizoram', the three regional councils were also upgraded as a full-fledged Autonomous District Council such as Lai Autonomous District Council (LADC), Chakma Autonomous District Council (CADC) and Mara Autonomous District Council (MADC) with effect from 29th April 1972 and remained a part of it when the state of Mizoram was created in 1987 by the Constitution (53th Amendment) Act of 1986.

Lawngtlai district has uniqueness and peculiarity amongst the districts as it enjoyed autonomous legislative, executive and judicial functions in accordance with the provisions of the Sixth Schedule to the Constitution of India. Lawngtlai District divided into four rural development blocks like Lawngtlai rural development block, Bungtlang S rural development block, Chawngte rural development block and Sangau rural development block. The inhabitants of the district are mainly the small ethnic groups like Lai, Chakma, Bawm, Pang and Bru who are among the minority communities which emphasis different folk dances and folk tales of their own.

III. DATA BASE AND METHODOLOGY:

To study the development level of electricity in Lawngtlai district, primary information was collected from 1,678 household (15 per cent of the total household) in the 20 villages and urban area by using multi-stage sampling techniques during the months of March 2015 to April 2016. Stratified random sampling was used to represent all sections of the population within each villages and town. Selection of household was made on the bases of types of locality like periphery or fringe areas, central or core, street structure as well as direction (north, south, east, west) and types of house such as thatch, Assam-type, cement concrete in proportionate to the total numbers of houses, depends upon the availability of the villages.

Level of electricity development in intra and inter rural development block were analyzed by using Standardized score and the development level of villages calculated by Principal Component Analysis (PCA) and Factor Analysis (FA) from seven variable indicators from Statistical Software of Statistical Package for Social Scientists (SPSS). In Factor Analysis (FA), the sampling adequacy can be assessed by examining the Kaiser-Meyer-Olkin (Kaiser 1970) and another test of the strength of the relationship among variables was done using the Bartlett's (1954) test of sphericity provides a chi-square output that must be significant.

IV. VARIABLE INDICATORS:

Development in terms of power supply cannot be measured in any single indicator. The following variable indicators are selected to analyze the level of electricity development:-

i) Number of electrified household in the study area

ii) Regularity of supply: access of power supply less than one hours in a day, access of power supply one to four hours in a day, access of power supply five to ten hours in a day, access of power supply more than ten hours in a day.

iii) Satisfaction of power supply by the respondents.

In this study area, there are 66.72 per cent are electrified houses. Hundred per cent electrified village found in R.Vanhne, more than ninety per cent of household are electrified in eight villages of Lawngtlai (98.95), Bungtlang S' (95.54), Hmunnuam (95.45), Sangau, Vartek, Pangkhua, Rawlbuk and Vartek. More than fifty per cent household in seven selected area like Mualbu L (89.47), W. saizawh (83.33) Ngengpuikai (79.41), Kamalanagar (75.58), Vaseitlang-II (71.43), Charluitlang (70) and Thaltlang (66.67) are electrified village, less than 20 per cent household in Vaseikai and Jamersury villages are electrified. The three villages of Dumzautlang, Tuithumhnar and Sekulhkai are absence of electric supply or un-electrified.

In respect of regularity and reliability of electric supply, 37.1 per cent of the respondents' access power supply of less than one hour in a day, 31.52 per cent access one to four hours power supply, 29.16 per cent access five to ten hours of power supply for 24 hours, only 1.61 per cent of the respondent's access more than ten hours electric supply in day. About 25 per cent of respondent's access power supply in a day amongst electrified household. 77.31 per cent are not satisfied in terms of electric supply in their respective villages while 22.95 per cent are satisfied with availability of electricity in the study area.

V. RESULT AND DISCUSSION:

The development level of electricity in the study area is analyzed at the level of village, intra and inter rural development blocks.

1***) Level of electricity development at intra-rural development block:***

i*) Lawngtlai rural development block:* Lawngtlai town scores the highest value of 3.36 which is categorized under very high level of development. A score value of 3.29, 1.32 and -1.29 found in the villages of

R.Vanhne, Ngengpuikai and Mualbu L, and, falls under medium level of development. The lowest value of -9.77 scored by the village of Tuithumhnar, and then categorized as low level of development.

Table:1 Level of Electricity Development in Lawngtlai Rural Development Block						
Sl No	Selected Area	Score	Rank	Level	Score	RD Block
1	Lawngtlai	6.36	1			
2	Mualbu L	-1.21	4	High	Above 5	Lawngtlai
3	Ngengpuikai	1.32	3	Medium	-5 to 5	R.Vanhne, Ngengpuikai, Mualbu L
4	R. Vanhne	3.29	2	Low	Below – 5	Tuithumhnar
5	Tuithumhnar	-9.77	5			

ii) *Sangau Rural Development Block:* Rawlbuk village scores the highest value of 2.93 under high level of development. Sangau and Pangkhua villages scores a value of 0.53 and -0.34 which falls under medium level of development. Vartek and Thaltlang villages scores the low value of -1.49 and -1.68 and categorized under low level of development.

Table:2 Level of Electricity Development in Sangau Rural Development Block						
Sl No	Selected Area	Score	Rank	Level	Score	RD Block
1	Sangau	0.58	2			
2	Vartek	-1.49	4	High	Above 1	Rawlbuk
3	Thaltlang	-1.68	5	Medium	-1 to 1	Sangau, Pangkhua
4	Pangkhua	-0.34	3	Low	Below -1	Vartek, Thaltlang
5	Rawlbuk	2.93	1			

iii) *Bungtlang S' Rural Development Block*: Bungtlang S'village scores a value of 10.90 in the development level of electricity. Hmunnuam and Vaseikai villages were categorized into medium level of development with a score value of 4.50 and -2.77. Sekulhkai and Dumzautlang villages also score a value of -6.31 respectively.

Table :3 Level of Electricity Development in Bungtlang S' Rural Development Block					
Sl No	Selected Area	Score	Level	Score	RD Block
1	Bungtlang S'	10.90			
2	Hmunnuam	4.50	High	Above 5	Bungtlang S'
3	Dumzautlang	-6.31	Medium	-5 to 5	Hmunnuam, Vaseikai
4	Vaseikai	-2.77	Low	Below -5	Sekulhkai, Dumzautlang
5	Sekulhkai	-6.31			

iv) *Chawngte Rural Development Block:* Kamalanagar village scores the highest value of 7.53 which is categorized under high level of development. The second highest value of 0.63 scored by W. Saizawh village and followed by Vaseitlang-II (-0.07) village which is classified under medium level of development. The two villages of Charluitlang and Jamersury were categorized into low level of development with a score value of -2.44 and -5.65.

Table: 4 Level of Electricity Development in Chawngte Rural Development Block						
Sl No	Selected Area	Score	Rank	Level	Score	RD Block
1	Kamalanagar	7.53	1			
2	Vaseitlang -II	-0.07	3	High	Above 2	Kamalanagar
3	Jamersury	-5.65	5	Medium	-2 to 2	W Saizawh, Vaseitlang–II,
4	Charluitlang	-2.44	4	Low	Below -2	Charluitlang,Jamersury
5	W Saizawh	0.63	2			

2) Level of electricity development at inter-rural development block:

Level of inter rural development block electricity Lawngtlai rural development block holds the first rank with a score value of 8.35 which falls under high level of development. The medium level of development found in Bungtlang S' and Sangau rural development blocks with a score value of -1.24 and -2.73. Chawngte rural development block falls into low level of development with score a value of -4.37.

Table:5 Level of Electricity Development in Lawngtlai District						
Sl No	Selected Area	Score	Rank	Level	Score	RD Block
1	Lawngtlai	8.35	1	High	Above 3	Lawngtlai
2	Chawngte	-4.37	4	Medium	-3 to 3	Bungtlang S', Sangau
3	Bungtlang S'	-1.24	2	Low	Below -3	Chawngte
4	Sangau	-2.73	3			

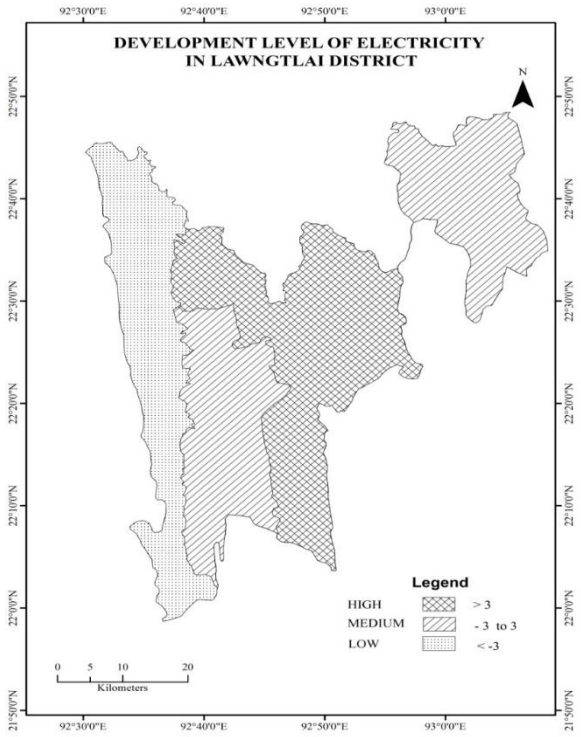

Figure: 1 Level of Electricity Development in Lawngtlai District

3***) Village level electricity development:***

To conduct Factor Analysis and rejected null hypothesis, the indicators were tested whether the data was appropriate to run software in SPSS. The Kaiser-Meyer-Olkin (KMO) show a value of 0.459 and Bartlett's test of sphericity was 0.000 significant levels showing the appropriateness of data.

Table:6 Level of Electricity Development in Lawngtlai District

Sl No	Selected Area	Score	Level	Score	Village/Town
1	Lawngtlai	22.033			
2	Mualbu L	15.681			
3	Ngengpuikai	18.004			
4	R. Vanhne	18.576			
5	Tuithumhnar	05.725			
6	Kamalanagar	14.658			
7	Vaseitlang –II	04.647	Very high	Above 20	Lawngtlai
8	Jamersury	02.938	High	15 to 20	Bungtlang S', R.Vanhne, Ngengpuikai, Mualbu L, Thaltlang
9	Charluitlang	04.111	Medium	10 to 15	Kamalanagar, Hmunnuam, Pangkhua, Rawlbuk, Vartek
10	W.Saizawh	06.086	Low	5 to 10	Sangau, W Saizawh, Tuithumhnar, Vaseikai
11	Bungtlang S'	19.796	Very low	Below 5	Vaseitlang –II, Charluitlang, Jamersury, Dumzautlang, Sekulhkai
12	Hmunnuam	13.915			
13	Dumzautlang	00.001			
14	Vaseikai	05.145			
15	Sekulhkai	00.001			
16	Sangau	09.408			
17	Vartek	10.712			
18	Thaltlang	15.123			
19	Pangkhua	12.822			
20	Rawlbuk	12.153			

Based on the final output of Factor Analysis and Principal Component Analysis, the village level of electricity development in Lawngtlai District can be categorized into five level of development:-

i) *Very high level of development:* The highest value of 22.033scored by Lawngtlai town which falls under very high level of development. Lawngtlai is the district headquarters along with administrative centers of Lai Autonomous District Council which administered the important governmental activities. This centers play a vital role in the developmental aspect as it provide services to the town and its hinterland.

ii) *High level of development:* Five villages were categorized under high level of development such as Bungtlang S' (19.796), R.Vanhne (18.576), Ngengpuikai (18.004), Mualbu L (15.681) and Thaltlang (15.123). Bungtlang S' is the block centers and located in the south western part of the district. This village play a very significant part for making services to the neighboring villages especially in terms of electricity. R. Vanhne and and Thaltlang villages situated in the nearby block centers of Lawngtlai and Sangau rural development blocks. The two villages of Ngengpuikai and Mualbu L located within the jurisdiction of Lawngtlai block. This block scores the highest value of electricity development amongst the rural development blocks in Lawngtlai district.

iii) *Medium level of development:* There are five villages of Kamalanagar (14.658), Hmunnuam (13.915), Pangkhua (12.822), Rawlbuk (12.153) and Vartek (10.712) falls under medium level of development. Kamalanagar is one of the authoritative village in Lawngtlai district as it is the headquarters of Chakma Autonomous district council which is very crucial for regional development in the study area. The other villages are also found in the nearby block centers.

iv) *Low level of development:* In this category, there are four villages like Sangau (9.408), W. Saizawh (6.086), Tuithumhnar (5.725) and Vaseikai (5.145). Sangau is the block centers, located in eastern region of the district. W. Saizawh and Vaseikai villages found in the western part which is difficult to get sufficient supply of power. Most of the respondents in these area are not satisfied in the power supplied given by government.

v) *Very low level of development:* Another five villages of Vaseitlang–II, Charluitlang, Jamersury, Dumzautlang and Sekulhkai categorized as under low level of development with a score value of 4.647, 4.111, 2.938 and 0.001.Three villages of Vaseitlang-II, Jamersury and Charluitlang were electrified village, but, no regular power supply. Dumzautlang and Sekulhkai villages were still un-electrified.

VI. CONCLUSION:

Availability and access of regular power supply is one of the important factors of rural socio-economic development. In the developing countries, some part of the rural areas received adequate power supply while the other villages are absence of electric supply due to various reason which makes developmental inequality in the region. The present study find that there is variation of availability and access of electric supply within the district which made rural-urban disparity in the region. This inequality may perhaps uncover problems among the society which led to serious problems like ethnic evils, social disorder and mental instability among the society. It also finds that the availability and regularity of power supply is not sufficient and reliable for sustaining rural economic development. This paper suggest that government intervention is very much necessary in the aspect of rural electrification, regularity and accessibility of electricity to promote sustainable development.

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