

# Rural Electrification in Bihar: Growth Prospects

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## ABSTRACT

Rural electrification is the main weapon of empowering rural people in any state. Bihar, which was known as one of the 'BIMARU States' and 'the land of dark houses' is now a role model in rural electrification for other states in the country. Rajiv Gandhi Gramin Vidyutikaran Yojna' continues to be the one all-encompassing program for rural electrification in Bihar. As 89% population of Bihar resides in villages, the economy of Bihar is rural economy. The rural electrification programmes will have a manifold effect on the state. In impoverished and backward areas, even small amount of electricity will save time and labour. To eradicate rural poverty in state, strengthening of rural infrastructure is necessary which is only possible with access of people to power. It is urgent need of the hour to make connectivity of the villages to the rest of the world and electricity is the only medium to run all electronic gadgets and to explore the world of knowledge. The present paper analyses the growth trends of rural electrification in Bihar. From the state of darkness to becoming a role model with 100% electrification in rural areas, role of BSEB(Now BSPHCL), its strategies and programmes, challenges and problems in the field of rural electrification has been discussed in this paper.

Keywords: Electrification, Strategies, Challenges, Rural poverty.

## Introduction:

The development story of any state can't be written without the development journey of its infrastructure, mainly energy and power sector. Bihar State that had suffered stagnation for a long period, witnessed a revival as the growth process was initiated by the present state Government. As a result the economy grew at an annual rate of 11.36% during the period 2004-05 to 2010-11 and by phenomenal 14.5% in 2012-13. (Directorate of Economics and Statistics, Govt. of Bihar). The economy of Bihar has reached at a take-off stage to follow a sustained path of socio-economic development and contribution of rural electrification in its growth journey can't be denied.

Just a few years back, Bihar was called "a state of Dark Houses". Then light means lanterns and kerosene was main fuel. Millions were still living in darkness and the state government moved towards rural electrification programmes. Rural electrification work started in Bihar in a planned manner after the formation of Bihar State Electricity Board in 1958. But it was only after 1972 that the work gained momentum under different plans sponsored by the Centre as well as the State Government. The Government of Bihar has been working efficiently for achieving 100% rural electrification. In 2015, Bihar became the first state in the country which had electrified the maximum number of un-electrified villages in a year. Out of the 39,073 villages in Bihar, more than 38,000 have already got electricity. Bihar became a role model for other states.

## Objectives of the study:

The main objectives of this study is to analyze the development journey of BSEB(Now BSPHCL) in the field of rural electrification and thus empowering the rural Bihar. The study also highlights the success and failures of different schemes of rural electrification in Bihar.

## **Hypotheses:**

\*The economy of Bihar remained backward due to power shortage in rural areas.

\*Gross State Domestic Product and rural electrification have direct relationship.

## **Methodology and Database**

The study has been conducted based on secondary data as well as primary data collected by the researcher during the survey for her PhD research. Secondary data obtained from publications of Bihar State Electricity Board, BREC, Economic Survey of Bihar of different years, newspapers, journals and books etc. The study period was divided into three sub-periods viz. 1958-2000, 2000-2012 and 2012-13 to 2018-19. The period –I refers to the period from setting up of BSEB in 1958 to the bifurcation of the state in 2000. Period 2000-2012 correspond to the progress of rural electrification in Bihar till the unbundling of BSEB among five different companies. Period-III correspond to latest development of rural electrification in the state.

## **Need for electricity in rural areas**

Electricity is the basic requirement for increasing labour productivity in agriculture, businesses, village industries and services. There is a positive correlation between the large per capita consumption of electricity and the high per capita level of income. In case of rural areas, both the consumption of electricity and the level of income are very low, both being the most valuable indices of the standard of living. Electricity is one of the basic infrastructures of rural economy. Through its use in industrial, agricultural, transportation, commercial, education and household sector, electricity penetrates directly or indirectly into every aspect of rural as well as State life. Access to light in houses has allowed for extra hours of study, schools with electricity are able to impart education in a progressive way by using computers and other appliances.

Farmers use power to run pump-sets for irrigation, crop processing, and food preservation in cold storages and warehouses. In addition, rural electrification also allows for greater efficiency and productivity. Businesses generate additional revenues, construction of power grids in rural areas create more job opportunities. Healthcare in hospitals and nursing homes at villages will be improved, with access of electricity. Availability of electricity reduces indoor air pollution as people avoid fossil fuel lamps i.e.; kerosene.

**Rural Electrification in India since Independence:** A village with basic power infrastructure such as transformer and distribution line provided to inhabited locality and at least 10% households in the village must have electricity. Till 1950 only 3,601 villages across country had electricity but by 1965, more than 45'000 villages were electrified. This number rose to 2.2 lakh villages and 43 lakh more pump sets were energized. Between 1988-89, Kutir Jyoti Programme was launched to provide single point connections to BPL households.

The economic liberalization era saw the slowest pace of rural electrification. Deteriorating financial conditions of state electricity boards slowed down the tempo as only 44,000 villages were electrified in this period.

From 2004 onwards, focus shifted to house hold, rather than village electrification . Rajiv Gandhi Grameen Vidyutikaran Yojna (RGGVY) was launched in March 2005 to provide electricity to all households and free electricity to all BPL families. In December 2014, Din Dayal Upadhyay Gram Jyoti Yojna was launched .Pradhan Mantri Sahaj Bijli Har Ghar Yojna-‘Saubhagya’ was launched on 25<sup>th</sup> September 2017 for free electric connections to all households in rural areas and poor families in urban areas. Providing access to electricity and technology, Saubhagya Mission has completely transformed the rural corners of India.

### **Growth of Rural Electrification in Bihar (1958-2000)**

Rural electrification work started in Bihar in a planned manner after the formation of Bihar State Electricity Board in 1958. But it was only after 1972 that the work gained momentum under different plans sponsored by the centre as well as the state government. It was mainly because of uneconomic nature of the electrification of rural areas. There was no separate department for rural electrification work. Mostly Urban fringe villages were electrified. It was convenient and also thought to be viable from the point of view of financial return.

In 1970, the Directorate of rural electrification was established at the Board’s headquarters. It was created in response of promise of financial assistance for rural electrification work from Rural Electrification Corporation (REC). REC was set up in July 1969, mainly to help State Electricity Boards energize pump sets across the country to boost agriculture. Besides finance, REC also offered appraising, consultancy, technical support and monitoring of projects to assist SEBs. **Minimum Need Programme (1974-79)** was initiated during the 5<sup>th</sup> Five Year Plan with rural electrification being one of the components. The fund was issued by central government as loans and grants.

**Kutir Jyoti scheme (1988-89)** aimed to extend single-point light connections to BPL and tribal families in rural areas. The scheme had limited impact in Bihar due to poor rural electrical distribution infrastructure and unreliable power supply.

Rural electrification infrastructure was strengthened by central assistance under Pradhan Mantri Gramodaya Yojna (2001-02).

Till March 1975, no separate accounts of the fund for rural electrification were kept by the Board. In 1977, the rural electrification work of the Board was placed under a full-time Chief Engineer (Rural Electrification) and the organizational set up for rural electrification work was reorganized during the year. In January 1980, five separate rural electrification circles at Bhagalpur, Darbhanga, Muzaffarpur, Patna and Ranchi were created. Another circle was established at Saharsa in April 1981.

**Statistics regarding Rural Electrification in United Bihar:** In 1962, the no. of electrified villages in Bihar was 2,591 only. There were 67,503 villages in Bihar out of which 45,603(67.5%) had been electrified as on 31 March, 1990. 47,127(69.81%) villages have been electrified and 2,66,797 tube wells have been energized as on 31.03.1995. 47,202(69.93%) villages were electrified and 2,72,319 tube wells had been energized as on 31.03.1998.

#### Year wise Total No. of Villages Energized in Bihar (1986-1998)

Year Ending	Electrified villages
March 1986	34,997
March 1988	40,444
March 1990	45,603
March 1992	46,648
March 1994	47,068
March 1998	47,202 (69.93%)

Source: Annual Report, BSEB, 1997-98

**Rural Electrification in Bihar (2000-2012):** One major blow to Bihar's access to resources came in 2000 when Bihar was bifurcated and most of the industrial consumers & power generating plants went with the new state of Jharkhand. The split adversely affected the electricity sector. Due to deterioration of Law & Order in the state, stealing of distribution wires and transformers led to de-electrification of villages. As a result of dismal performance of electricity, most groundwater irrigation facilities in rural areas were powered by diesel/kerosene. In villages, minigrids and microgrids fueled by diesel, some fueled by Biomass (particularly bagasse) were formed. Some rural households began installing small battery-backed solar panels for their lighting requirements. The period 2000-01 to 2004-05 was indeed a dark period in the history of electric power and political powers in Bihar. Rural electrification component was added by central assistance under Pradhan Mantri Gramodaya Yojna (2001-02). Accelerated Electrification Programme was introduced in 2004-05 by merging Accelerated Rural Electrification Programme (2003-04) and Kutir Jyoti Programme with the aim to electrify one lakh villages and one crore households. It was implemented under overall supervision and control of REC as lead agency for the scheme.

Bihar's trajectory of economic performance, including that of the electricity sector, changed post 2005 after the new govt. came in power in Bihar. The state witnessed more than 10% annual growth for the period 2004-05 to 2014-15 (GOI, Economic Survey, 2017). An independent regulatory body, the Bihar Electricity Regulatory (BERC), was established in 2005 under the Electricity Act, 2003, and, finally, functional unbundling of BSEB into five companies in 2012 as-

1. Bihar State Power Holding Corporation Limited (BSPHCL)
2. Bihar State Power Generation Company Limited (BSPGCL)
3. Bihar State Power Transmission Company Limited (BSPTCL)
4. South Bihar Power Distribution Company Limited (SBPDCL)
5. North Bihar Power Distribution Company Limited (NBPDCCL)

NBPDCCL and SBPDCL-these two companies are responsible for distribution of electricity to all consumers and implementation of rural electrification schemes- under Deen Dayal Upadhyay Gram Jyoti Yojna, special Backward Region Grant Fund (BRGF), Integrated Power Development Scheme (IPDS), State Plan, and schemes funded by the Asian Development Bank (ADB) and Externally Aided Project(EAP).

Only 10.37% of rural households were electrified in Bihar till 2011 while 95.27% of villages electrified till June 2013.(Source: Central Electricity Authority).During these periods, electric poles could be seen crossing through villages, but sadly no electricity passed through them.

The Government of India, under the new scheme of RGGVY, launched rural electrification work under 10<sup>th</sup> plan in 2005.REC was nodal agency at national level for the implementation of this scheme. The working agency for this scheme was PGCIL and NHPC. This scheme was only for BPL households in 25 districts of Bihar. RGGVY's 11<sup>th</sup> plan phase-1 was launched in 2008 for 17 districts of Bihar and the working agencies for this scheme were PGCIL, NHPC and BSEB. Experiencing lack of adequate Village Electricity Infrastructure, the Government of India sanctioned scheme for full scale electrification of all villages and habitations having population more than 100 in 11 districts of Bihar under 11<sup>th</sup> Plan Phase -2 and 27 districts of Bihar under 12<sup>th</sup> Plan.

### **Rural Electrification in Bihar (2012-13 to 2018-19):**

BSEB formally started functioning as 5 companies on 1 November 2012 namely BSHPCCL (Apex Holding Company), BSPGCL (Power Generation Business),BSPTCL(Transmission Business),NBPDCCL(Distribution Business),SBPDCL(Distribution business). Rajiv Gandhi Gramin Vidyutikaran Yojna continues to be one all encompassing programme for rural electrification in Bihar. In September 2012,43 projects of rural electrification were sanctioned for Bihar under RGGVY. The state-run "Mukhya Mantri Vidyut Sambandh Nischay Yojna" aimed at reaching power in rural areas, merged with the Centre's universal household electrification project- 'Saubhagya'. Under the CM's rural electrification scheme, the state govt. provided monetary support to achieve the objective within the jurisdiction of both North and South Bihar Power Distribution Companies (NBPDCCL & SBPDCL). And efforts to deliver electricity to agricultural land and cut farmer's dependence on diesel pump sets, the state government is promoting the use of solar pumps which costs almost one-fourth of a diesel pump set.

However, to address some of the challenges faced in its implementation, the Government of Bihar has formulated and implemented a new approach to ensure better implementation of the yojna. The first initiative was to award tenders to companies on a turnkey basis on Standard Bidding Document (SBD).A separate wing called the Project Wing was established for better implementation of rural electrification

work. To maintain quality of rural electrification work, executive engineer project, assistant engineer project and junior engineers projects have been given the responsibility of monitoring the turnkey company's work at all level. A special task force was formed in Bihar only for monitoring and assuring the quality of rural electrification work.

Under Mukhyamantri Vidyut Sambandh Nischay Yojna, a nearly 50 lakh APL families were provided connectivity in rural areas by December; 2018. Rural electrification is posing a lot of challenges but is moving at a great speed in Bihar. It became a role model for other states facing similar challenges. In 2015 only, Bihar became the first state in the country which had electrified the maximum number of unelectrified villages in a year.

**Table-1**

**Existing Distribution Infrastructure as on 31.03.2019**

Sl no.	Particulars	SBPDL	NBPDL	Total
1	No. of electrified villages	22126	23284	45410
2	No. of consumers	54 Lakhs	82.91 Lakhs	136.91 Lakhs

Source: BERC

**Table-2**

**DDUGJY: Status of Rural Electrification in Bihar on 30.11.2017**

Village Electrification	Nos.
a.Total inhabited villages (2011)	39073
b.Un-electrified Village (01.04.2015)	2747
c.Villages electrified during 2015to2017	2310
d.Electrified upto 30.11.2017	225
e.Un-inhabitated villages	101
f.Balance Un-electrified villages as on 30.11.2017	111

**Source:Progress Report:DDUGJY,Bihar.**

As on 25.10.2018, all households in the state stand electrified and saturation has been achieved. 21, 90,935 households have been electrified under all schemes.

**Finances for Rural Electrification:-** Central Electricity Authority (CEA) constituted under Section 3 of the Electricity Supply Act of 1948 to collect and publish the financial statistics of BSEB from time to time. BSEB has no capital of its own. All SEBs fund are borrowed funds with no equity capital.

Bihar became a big beneficiary of the Backward Regions Grant Fund (BRGF) which is utilized mostly in power sector for rural and remote areas. Out of total Rs.12, 000 Crore under BRGF for 12<sup>th</sup> Plan, Rs. 8308.67 Crore was earmarked for the electricity sector. Due to changed hierarchy and fixing of responsibilities to increased staff, capacity to spend money on projects increased significantly after 2012.

Bihar's rural revenue collection has improved after implementation of Rural Revenue Franchisees (RRF). The scope of RRF is limited to meter reading, bill distribution and revenue collection. They have no role in managing the electricity network. There are 3500 RRFs in the state covering about 51 lakh rural consumers (2016-17).

**Table-3**  
**Tariff Rates: Existing by DISCOMs**

Category		Tariff		
<b>Kutir Jyoti</b>	<b>Fixed Charge</b>	<b>Unit</b>	<b>Energy charges</b>	<b>Unit</b>
<b>Unmetered</b>	<b>350</b>	<b>Per connection/per month</b>	<b>0.00</b>	<b>kwh</b>
<b>Metered(0-50) remaining units rate as per DS-I or DS-II as applicable</b>	<b>10</b>	<b>Per connection/per month</b>	<b>6.15</b>	<b>Kwh</b>

<b>DS-I (RURAL)</b>				
<b>Unmetered</b>	<b>500</b>	<b>Per connection/per month</b>	<b>0.00</b>	<b>Kwh</b>
<b>Metered</b>				
<b>First 50 units</b>	<b>20</b>	<b>Per kw/month</b>	<b>6.15</b>	<b>Kwh</b>
<b>51-100 units</b>	<b>20</b>	<b>Per kw/month</b>	<b>6.40</b>	<b>Kwh</b>
<b>101-200 units</b>	<b>20</b>	<b>Per kw/month</b>	<b>6.70</b>	<b>Kwh</b>
<b>Above 200 units</b>	<b>20</b>	<b>Per kw/month</b>	<b>7.05</b>	<b>kwh</b>

<b>NDS-I (RURAL)</b>				
<b>Metered</b>				
<b>1-100units/month</b>	<b>30</b>	<b>Perkw/month</b>	<b>6.40</b>	<b>Kwh</b>
<b>101-200 units/month</b>	<b>30</b>	<b>Per kw/month</b>	<b>6.95</b>	<b>Kwh</b>
<b>Above 200 units</b>	<b>30</b>	<b>Per kw/month</b>	<b>7.50</b>	<b>kwh</b>

Source: Bihar Electricity Regulatory Commission, Patna (2018-19)

## Key Findings of the Study:

### Challenges:

1. Due to electric shock, some of the villagers do not want to take electric connection.
2. Most of the people are not aware of charges etc. of electricity. They think that they will have to deposit heavy amount for taking electric connections.
3. Some persons think that they cannot afford to pay the fixed charge taken by the government. So poverty is also one of the reasons for not taking connection.
4. Power theft, indifferent attitudes of staffs and linemen, lack of inter-departmental co-ordination, lack of motivation, voltage fluctuation, power-cut-for hours, lack of information regarding connection process and official formalities are the problems behind the rural electrification promotion. Removals of these problems certainly help to promote rural electrification in Bihar and BSPHCL has to play an effective role.
5. Cost for providing electricity to remote villages remains high. Extension of Power Grid to remote areas is a costly affair.
6. It has been difficult to estimate the changes in the number of unelectrified households. Reason was found that many census households were living together and availing electricity services with a single connection.
7. The question may arise- will DISCOMs (NBPDC& SBPDCL) BE ABLE TO SERVICE THE rural households with 24x7 power, as Bihar Discoms had a loss INR 2125 crores in FY 14.
8. Rural consumers are not coming forward for installation of prepaid meters as pre-paid meters lead to payment of energy charges in advance.

### Suggestions:-

- \*Regular inspection and preventive maintenance of Distribution Transformers required in rural areas.
- \*In many villages, electricity has been extended by running service wires on wooden/bamboo poles. Electricity conductor and proper poles in all such villages should be provided.
- \*Malpractices like power theft, delay in billing be curbed and vigilance machinery be strengthened. Wrong bills be rectified expeditiously.
- \*Cross subsidy should be minimized and if not eliminated.
- \*Official formalities for getting electric service connection should be minimized.
- \*Communication gap between functionaries and people should be narrowed.
- \*Villagers are needed to make aware of the uses of electricity in their agricultural practices, mechanization etc. They should be informed about the formalities and subsidies available to small & marginal farmers.

### Conclusion-

The objective of 100% electrification in rural areas by improving connectivity of rural areas to grid power is of great importance. The rural electrification work has been completed in all 38 districts of the state under DDUGJY. During the recent years, the demand for electricity has largely increased in the state due to fast economic growth on the one hand and the growth of population on the other. This has resulted in high AT&C (Aggregate Technical & Commercial) loss, especially large scale rural electrification. Current evaluation shows that DISCOMs have not been able to reduce systemic issues of higher losses, low revenue generation and gaps in monitoring connections despite a targeted policy. It also has been found that with



the data provided by the energy provided by the energy department, that there is 100% rural electrification, those are left, will find it difficult to get a connection, as it is shown on paper as per DISCOMs.

This study concludes that rural electrification plays a crucial role in making favorable changes in the development process of Bihar but these changes are not so radical. Hence still a very long distance needs to be covered. Villages have been developed, village industries have been empowered, farmers are economically empowered as their monthly income has increased due to proper utilization of electric power for agricultural as well as non- agricultural works. In last 10 years, Bihar has progressed in terms of State domestic product which is certainly due to increase in availability of power .Per capita consumption has increased by 114 percent between 2012-13 and 2018-19.Indeed development of Bihar and growth of rural electrification have directly correlated .

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