

Social Cost–Benefit Analysis of Rajiv Gandhi Grameen Vidyutikaran Yojana: An Analysis

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Abstract

This study aims to examine the economic and social aspects of villages under the rural electrification scheme launched by the Government of India in the context of Sonitpur district of Assam (India). The United Nations Industrial Development Organization (UNIDO) method is used to find out the economic benefits of the project in terms of economic (shadow) pricing of the area under study and the impact of the project on savings and investments in Sonitpur district. Primary data such as questionnaire and interaction with villagers and secondary data from various reliable sources are used to fulfil the objectives. The study finds that apart from financial viability, the project is viable from a social perspective as people's standard of living, income and government savings increased from the past years.

Keywords: Social cost–benefit analysis, shadow pricing, merit wants, UNIDO approach, RGGVY, AQRH

1. Introduction

Electricity supply in cities and metropolises is good when compared with rural India. Electricity is one of the major problems in villages. In order to minimise the rural–urban gap and to electrify the villages, the Government of India launched the Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY)—Scheme for Rural Electricity Infrastructure and Household Electrification in April 2005 with the objective of providing access to electricity to all households and improving rural electricity infrastructure. The Scheme of Rural Electricity Infrastructure and Rural Household Electrification was sanctioned in the XI-Plan for attaining the goal of providing access to electricity to all households, electrification of about 1.15 lakh un-electrified villages and electricity connections to 2.34 crore BPL households by 2012. The approval was accorded for a capital subsidy of ₹28,000 crore during the Eleventh Plan period (Rajiv Gandhi Grameen Vidyutikaran Yojana [RGGVY], 2012).

The Power Grid Corporation of India Ltd plays a key role in implementing this project. Power Grid is the Central Transmission Utility and a 'NAVARATNA' company of the country carrying about 50 per cent

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of power generated in India and is the third largest transmission utility in the world. It is primarily engaged in power transmission business with the responsibility of planning, co-ordination, supervision and control over interstate transmission system and operation of national and regional grids. As an implementing agency for the scheme, the company charges consultancy fees for the work done. The consultancy fee varies from district to district and ranges between 10 and 15 per cent of the project cost (Power Grid Corporation of India Ltd., 2012).

Execution of the Scheme

Rural Electrification Corporation is the nodal agency for the scheme and the various state governments involved through their electricity boards. The role of Power Grid is to prepare a detailed project report as per the guidelines of Rural Electrification Corporation and implement the scheme.

Social Cost–Benefit Analysis: SCBA evaluates the project from the society point of view, that is to analyse the positive and negative impact of the project on society. In the evaluation of a project, SCBA is as important as cost–benefit analysis. SCBA considers long–term consequences of a project which has a macro-level impact on the economy. It plays a significant role in investment decisions mainly in developing countries where government decision has a major impact on economic development. Today, private investments are also using this analysis to bring larger national consideration in their investment (Chandra, 2010).

The United Nations Industrial Development Organization (UNIDO) approach, *Guide to Practical Project Appraisals, 1978*, is used as a base for the SCBA of the RGGVY project. UNIDO approach involves five stages:

- Calculation of financial profitability of the project at market price.
- Obtaining the net benefit of the project measured in terms of economic (efficiency) price.
- Adjustment for the impact of the project on savings and investments.
- Adjustment for the impact of the project on income distribution.
- Adjustment for the impact of the project on merit goods and demerit goods whose social values differ from their economic values.

Review of Literature

Murty et al. (2006) carried out an SCBA of Delhi Metro and found that Delhi Metro provides multiple benefits, such as reduction in air pollution, saving passengers' time, reduction in accidents, reduction in traffic congestion and saving of fuel. They found that the project is socially viable as the social benefits exceed the social cost. Financial internal rate of return of metro is 17 per cent, whereas economic rate of return is 24 per cent.

Fujiwara (2010) in his report of the Department for Work and Pensions tried to derive quantitative estimates of the social costs and benefits associated with implementing employment programmes in the UK through an SCBA. This paper provides an overall review of the main evidence on the social impact of employment and employment programmes.

Venkatesan et al. (2007) in a report of SCBA of POSCO steel plant at Orissa used least cost approach and economic analysis to evaluate the same. Economic internal rate of return of the project is 16.6 per cent higher than the Asian Development Bank hurdle rate.

As per the evaluation report of RGGVY, the Planning Commission (2014) finds that the scheme provides various benefits such as improvement in communication and awareness of various programmes, increase in the level of education, increase in employment and income and gives positive gender benefits.

2. Objectives of the Study

1. To make a cost–benefit analysis of the RGGVY project undertaken by Power Grid Corporation Ltd of India in Sonitpur district of Assam.
2. To assess the economic benefit of the project in terms of economic (efficiency) pricing of the area under study.
3. To evaluate the impact of the project on the level of savings and investments in the study area.

Scope of the Study

The study is carried out as per the UNIDO approach and only the first three steps are covered. The later two steps of UNIDO approach, that is, impact of the project on income distribution and impact of the project on merit and demerit goods, could not be carried out because of limited time. The last two steps along with environmental aspects will be discussed in a subsequent article. The study is done for the year 2012 and covers Sonitpur district of Assam.

3. Data Source

The study considers both primary and secondary data. Secondary data are applied to analyse the first objective of the study. The databank of Power Grid Corporation of India Ltd (Power Grid Corporation of India Ltd., 2012) and data from other sources such as India Energy Data and Energy Information Administration 2012 are used. On the other hand, primary data are collected through structured questionnaires distributed among 120 households in Sonitpur district, which are electrified through RGGVY scheme. The sample size is decided taking into account the fact that one villager enjoys the same power supply as enjoyed by the other villager; thus, the level of expectation of the villagers is homogeneous but this is not same in different blocks. The questionnaires are designed to obtain information on various aspects such as per month spending on electricity and kerosene, electronic appliances used by them, impact on social and economic aspects and savings in kerosene (Annexure 1). Convenience sampling has been used for identifying the samples from various blocks as electricity is provided equally to the whole village and not to a particular household.

Sampling Plan

Block covered: Dhekiajuli block, Tezpur block, Biswanath block, Gohpur block, Chariduar block and Na duar block.

Sample size: 120 households from 25 villages.

Table 1. Break up of Sample Villages and Households Selected

Name of the Block	Number of Villages Selected	Number of Households Surveyed
1. Dhekiajuli Block	5	30
2. Tezpur Block	5	20
3. Biswanath Block	5	25
4. Gohpur Block	5	20
5. Chariduar Block	3	15
6. Na duar Block	2	10

Source: Primary data.

Sample element: Households (preferentially head of the household).

Qualifying sample element: After every five house after previous sample till sample size is achieved per village.

The details of block covered and household surveyed is shown in Table 1.

4. Methodology

This study basically tries to examine the economic and social aspects of villages under the RGGVY electrification scheme launched by the Government of India (RGGVY, 2012) in the context of Sonitpur district of Assam. To make a cost–benefit analysis of the RGGVY project, secondary data are analysed, using tables and diagrams.

For the second and third objectives, a structured questionnaire is used to fulfil the same. To determine the economic benefit, shadow price is assigned to various cost components. Shadow pricing refers to the opportunity cost of an activity or a project to the society, computed when the actual price is not known or, if known, does not reflect the real sacrifice made.

Objective I

Cost–Benefit Analysis of the Project from Power Grid Corporation: Table 2 provide the details of the cost incurred by the four contracting parties, that is, Everest Infra Energy Limited, ICSA, GET Power and WinPower. These cost are then grouped on the basis of its homogeneity in Table 3.

As in a transformer both iron and steel are used, it is assumed that 70 per cent of the cost is incurred for iron and the remaining 30 per cent for steel. The cost for earthing is distributed between copper and zinc in the ratio 50:50 and similarly the cost of insulator is also allocated between rubber and plastic in the ratio 50:50. Nichrome is used for fuses, whereas iron is used for switches.

Benefit of the Project from Power Grid's Point of View: Rural Electrification Corporation is the nodal agency for the scheme and the various state governments involved through their electricity boards. The role of Power Grid is to prepare a detailed project report as per the guidelines of Rural Electrification Corporation and implement the scheme.

Table 2. Cost Incurred by Power Grid Corporation

List of Items	Total Cost of Power Grid	
	Quantity (Ton)	Total Amount (₹)
A/Pole (cement)		
A1/PSC pole 8.5M excav	27,538	21,198,839
A2/8.5 M 200 kg PSC Pole	33,495	8,052,025
A3/7.5 M 140 kg PSC pole	45,838	6,628,880
B/Ground Wire		
B1/3-phase-4 wire with ACSR Squirrel	173.5	582,702.5
B2/Pole Stay wire 7/3.15 mm	1,997	8,437,005
B3/Pole Stay wire 7/3.15 mm	364.66	1,527,390
B4/Stay wire 7/14 SWG	112.9	8,044,100
B5/3-phase-4 wire with ACSR Squirrel	262.04	18,446,107
B6/1-phase-2 wire with ACSR Squirrel	7.1	56,626.06
B7/Stay wire 7/14 SWG	1,824	7,496,915
C/Earthing (copper and zinc)		
C1/20 mm 2.5MM GI Rd Erthg	9,992	100,896
C2/Pipe earthg 40mm 2.5M	31,205	9,262,835
C3/20mm 2.5M GI rod—earthg	1,663	7,080,410
C4/40mm 2.5M GI pipe—earthg	26,308	611,230
C5/20mm 2.5M GI rod—earthg	7,700	332,500
C6/20mm 2.5M GI rod—earthg	1,952	75,200
D/Nuts and Bolts (iron)		
D1/Hot dip galvanised bolts, nuts	28,378	820,874
D2/Nuts, bolt	143.98	13,231,461
E/Fuses and Switch (nichrome and iron)		
E1/AB switch 3ph with 6 pi	162.13	656,052.8
E2/AB switch 2ph with 4 pi	19,175	4,870,868
E3/11 kV 3-Ph. DO fuse set	3,090	601,200
E4/11 kV 2-Ph. DO fuse set	5,192	361,715
E5/DO Fuse Operatg Maint rd	1,777	89,156
F/Insulator (rubber, plastic)		
F1/LT Pin insul GI Pin	80	860
F2/LT Shackle insul REC std	63,849	2,895,686
F3/Stay insulator	37,639	238,632
F4/11 kV Pin insul with GI	57,291	708,218
F5/11 kV Disc insulator assembly	43,638	546,124
	36,224	16,259,326

(Table 2 continued)

(Table 2 continued)

List of Items	Total Cost of Power Grid	
	Quantity (Ton)	Total Amount (₹)
F6/LT Shackle insulator Type-I	62,112	1,644,316
F6/11 kV Disc insul assem	39,785	1,238,430
G/Transformer (iron, steel)		
G1/3ph distr. transf 25 KVA	269	1,703,122
G2/1ph.distr. transf 16 KVA	2,442	14,388,748
G4/3 ph distr. transf 25 KVA	197	591,457
G5/1 ph distr. transf 16 KVA	3,256	6,251,968
I/Aluminium		
I1/Aluminium alloy conductor	1,839	1,712,304
I2/Alum. conductor steel reinforced	5,815.8	2,183,799
I3/ACSR squirrel conductor	65,619	7,477,832
J/Galvanised Item (steel)		
J1/Galvanised item for pole top	1,087.1	75,684,794
J2/Fabrication and supply of galv. item	1,291	90,896,191

Source: Power Grid Corporation of India Ltd, RGGVY (2012).

Table 3. Major Items of the Cost Are Segregated in the Following Head

Name of Item	Amount (₹)	Percentage of Share in Total Cost
Aluminium	11,373,935	3.33
Iron	34,915,525	10.23
Cement	35,879,744	10.52
Copper	53,783,265	15.77
Steel	173,461,573	50.86
Nichrome	451,731	0.13
Rubber	11,025,366	3.23
Plastic	11,025,366	3.23
Zinc	9,091,524	2.66
Total	341,008,029	100

Source: Power grid Corporation of India Ltd, RGGVY 2012.

Power Grid received a commission of 8–10 per cent (based on district) on the cost incurred (Power Grid Corporation of India Ltd; RGGVY, 2012). Thus, from Power Grid's point of view it is beneficial for them, that is, for a cost incurred of ₹100, ₹8 is the profit.

Objective 2

Economic (Efficiency) Pricing

Assigning of Shadow Prices to Various Cost Components: Under the UNIDO approach, for the tradable goods the import price is considered as shadow price and for non-tradable goods cost of production is treated as shadow price for that item. As the project is related to infrastructure which in turn does not lead to increase or decrease of consumption in the economy, consumer willingness to pay is not taken into account (Prasanna Chandra, 7th edition, Project Management). The details of shadow price of cost component based on Border price and cost of production is provided in Table 4 and 5 respectively.

Net value of the project in economic price is ₹55,369,048.29.

Net Social Benefit Obtained by the Villagers of Sonitpur District: The implementation of the RGGVY leads to drastic change in the level of education and in standard of living of the villagers.

There was a significant growth in the literacy rate as this scheme provided basic light for education and the people also developed a tendency to send their children to school as various schemes and missions of rural areas were communicated to the masses effectively through various electronic modes.

The standard of living of a family is judged based on various aspects, such as per month spending, quality of food they have, access to various electronic appliances and various items they use in their daily life.

The survey gives the report about the changes in their lifestyle and the impact of the project on the level of education of the villagers.

Table 4. Shadow Price of the Cost Component Based on Border Price

Cost Component	Basis of Shadow Pricing	Rate Per Metric Ton	Quantity (MT)	Total (₹)
Aluminium	Border price	108,554.74	73.27	7,953,805.80
Copper	Border price	429,889	63.33	27,224,870.37
Steel	Border price	42,000	130	5,460,000
Nichrome	Border price	250,000	7.04	1,760,000
Zinc	Border price	106,927	48.60	5,196,652.2
Total Economic Price				47,595,328.37

Source: Current Primary and Scrap Metal (2012).

Table 5. Shadow Prices of Cost Component Based on Cost of Production

Cost Component	Basis of Shadow Pricing	Rate Per Metric Ton	Quantity (MT)	Total (₹)
Iron	Cost of production	11,234	26.88	301,969.92
Cement	Cost of production	25,000	106.87	2,671,750
Rubber	Cost of production	48,000	80	3,840,000
Plastic	Cost of production	12,000	80	960,000
Total				7,773,719.92

Source: Current Primary and Scrap Metal (2012).

The various benefits of the scheme are as follows (descriptive analysis):

1. *Change in Per Month Spending:* As a result of various programmes and advertisements on television, the per month spending of the villagers increased considerably. Majority of the villagers, that is, 60 per cent, spend ₹3,000 on various items, such as food, electricity bill, recharge for TV and mobiles, water filter, clothing and other items, which in turn has an impact on positive living standards. The details of per month spending of surveyed household is given in Table 6.
2. *Electronic Appliances Used:* In the survey, it was found that majority of the households have some kind of electronic appliances. Due to electrification, the villagers have access to television, motors, computer, mobile phone, etc. which improves the standard of living of the villagers.

Mobile phones help the villagers to have a better connectivity with the outer world. The state governments introduce various emergency services for health, fire, police, etc., and villagers avail the same by dialling the number from their homes. Because of televisions, villagers are much more aware about the happenings in the outside world, such as government schemes, economic and political condition and state of unemployment. Earlier, majority of the villagers used tube well and well but with rural electrification, villagers have water motor which reduces their time and energy in extracting from the sub-surface. Computers and refrigerators are used by some households and most of them belong to the salaried class. The details of electronic appliance used by the villagers are given in the Table 7.

3. *Decrease in Harmful Effects of Kerosene:* Kerosene-based lighting causes indoor pollution and poses fire risk. As per the report published by the World Health Organization, kerosene lamps are responsible for 70 per cent of fire incidents and 80 per cent of burn injuries (Kerosene Poisoning, 2012). Using kerosene as a source of lightning for studying leads to various air quality-related health (AQRH) symptoms, such as coughing, chest pain and difficulty in breathing. Rural electrification

Table 6. Per Month Spending

Per Month Spending	Number of Households	Percentage of Households
More than 3,001	72	60
2,501–3,000	30	25
2,001–2,500	12	10
Less than 2,000	6	5

Source: Primary data.

Table 7. Electronic Appliances Used by the Households

Electronic Appliances	Number of Households	Percentage of Households
Television	90	75
Mobile	117	97.5
Motor	34	28.33
Inverter	13	10.83
Computer	9	7.5
Refrigerator	10	8.3
Others	8	6.66

Source: Primary data.

Table 8. Impact of the Project on Various Social and Economic Variables

Social and Economic Variables	To a Lower Extent		To Some Extent		To a Greater Extent	
	No. of Households	Percentage	No. of Households	Percentage	No. of Households	Percentage
Impact on education	8	6.66	21	17.5	91	75.83
Impact on employment	75	62.5	40	33.33	5	4.16
Impact on income	65	54.16	42	35	13	10.83
Impact on women empowerment	18	15	38	31.66	64	53.33

Source: Primary data.

considerably decreases use of kerosene which in turn decreases the harmful effects of kerosene. But from the general point of view, it is worth mentioning that even though all the villages are electrified, kerosene is still used because of erratic and irregular power supply.

4. *Impact on Various Socio-economic Conditions:* In the survey, it was found that Rural Electrification Corporation has an impact on the various aspects of social and economic conditions of the villagers. The details of impact of the RGGVY on various social and economic variables are provided in Table 8.

Impact on education: In the survey, 75.83 per cent of the households agreed that rural electrification led to a drastic change in the level of education of their children. Prior to this, kerosene and candlelight were the only sources of lighting. With RGGVY scheme, students enjoy better study hours, mainly in the evenings, which in turn has an impact on education. Through televisions, villagers have better access to government schemes, such as Sarba Siksha Abhiyan and others, which motivate them to send their children to school.

Impact on employment: Majority of the households are of the view that rural electrification has a very low impact on their employment and they are continuing with the same occupation; 33.33 per cent of the households agreed that electricity indirectly helps in their occupation, for example, farmers have greater access to government schemes through TV and households engaged in handicraft activity can spend more time during the evening which in turn strengthens their business. However, it was found that five households' occupation changed completely as they started new business where electricity plays a vital role, such as Internet cafe, photocopy, scan and photo house.

Impact on income: Through an informal discussion with the villagers, it was found that electricity is used mainly for entertainment purposes. However, very few respondents use the same for productive purposes, such as using electric pump set to irrigate small croplands. In the survey, it was found that 35 per cent of the respondents agreed that rural electrification increases their income to some extent; villagers are aware about various employment generation schemes, such as the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), which increased the number of working days of the villagers and in turn increased the income level.

Impact on women empowerment: Rural electrification has brought about significant women empowerment. Women have better knowledge on the various women empowerment schemes of the government, and they are aware about health, beatification, education of children through various TV programmes: news channel, movies, serials, etc.

Burden of women's work such as lighting kerosene lamp and time and energy for extracting sub-surface water for domestic purpose reduced considerably.

Table 9. Dependent on Various Means for Cultivation

Source for Cultivation	Number of Households	Percentage of Households
Manual	86	70.85
Diesel generator	20	16.66
Electricity pump set	10	8.33
Combination of both (diesel and electricity)	4	4.16

Source: Primary data.

Table 10. Villages and Households under RGGVY in Sonitpur District

Name of the Block	Total No. of Villages	No. of Villages	No. of Villages (Proposed to be Electrified)	No. of Households
Dhekiajuli	344	252	92	27,170
Chariduar	314	194	120	20,895
Gohpur	210	80	130	13,520
Helem	199	139	60	10,812
Na duar	183	161	22	19,730
Tezpur	120	104	16	6,193
Biswanath Chariali	326	205	121	2,203
Total		1,135		102,883

Source: Primary data.

5. *Energy Source for Irrigation Purpose:* In the survey, it was found that majority of the villagers of Sonitpur district depend on monsoon for cultivating their fields. Out of 120 households, only 20 people used diesel pump set and 10 used electric pump sets. Only five households used both sources of energy, that is, diesel and electricity, for irrigation. The details of various source of cultivation is provided in Table 9.

Objective 3

Impact of the Project on Savings and Distribution: Impact of the project on savings and distribution analyses the income distribution impact of the project, that is, RGGVY, and amount of kerosene saved because of electrification of such villages. It also gives the value of such savings to the society.

Total Amount of Kerosene Saved for RGGVY Scheme: The total number of rural households in Sonitpur district as per the detailed project report of Power Grid is 102,883, and the total number of villages as per the DPR of Power Grid is 1,135. This only includes the list of households and villages that were already electrified and does not cover the villages that are proposed to be electrified. The details of amount of kerosene saved per month by household and kerosene saved in Sonitpur districts is provided in Table 11 and 12 respectively.

Total Household under RGGVY in Sonitpur district was 1,02,883 and proportion of sample survey was taken as base to find out the kerosene saved by the household for the year 2011. The details of

Table 11. Amount of Kerosene Saved Per Month by Households

Litres	Percentage of Households
Less than 2	10
2.01–4	38.23
4.01–6	31.42
6.01–8	20.35
More than 8.01	None

Source: Primary data.

Table 11.1. Calculation of Kerosene Saved for the Year 2011 in Sonitpur District

Kerosene Saved (in litres)	Percentage of Sample	No. of Households Based on Sample	Kerosene Saved Per Month (in litres)
2	10	10,288	102,880
4	38.23	39,332	157,328
6	31.42	32,325	193,950
8	20.35	20,937	167,496
Total litres of kerosene saved			621,654

Source: Primary data.

amount of kerosene saved per month by household and kerosene saved in Sonitpur districts is provided in Table 11 and 12 respectively.

$$\begin{aligned} \text{Therefore, total kerosene saved annually} &= 621,654 \text{ litres} \times 12 \text{ month.} \\ &= 7,459,848 \text{ litres} \end{aligned}$$

Actual Amount of Savings by Households of Sonitpur District: Actual amount of money saved is calculated by adding the average per month electricity bill paid with the amount spent on actual consumption of kerosene and deducting the average monthly savings in kerosene by the households.

$$\text{Actual saving} = \text{Amount of kerosene saved} - (\text{Electricity bill paid} + \text{Kerosene used for lighting}).$$

The details of money spent on electricity (per month) and calculation of total amount spent on electricity in Sonitpur district is shown in table 12 and 12.1 respectively.

Table 12. Money Spent on Electricity (per month)

Bill Per Month (₹)	Percentage of Households
Less than 80	13.33
81–120	50
121–160	26.67
161–200	10
More than 201	None

Source: Primary data.

Table 12.1. Calculation of Amount of Paid as Electricity Bills

Amount (₹)	Percentage of Sample	No. of Households Based on Sample	Total Amount (₹)
80	13.33	13,714	1,097,120
120	50	51,441	6,172,920
160	26.67	27,438	4,390,080
200	10	10,288	2,057,600
Total amount paid			13,717,720

Source: Primary data.

Table 13. Kerosene Actually Used for Lighting

Actual Litres of Kerosene Consumed	Percentage of Sample
No consumption	15.33
2	54.26
4	26.67
6	3.74
More than 6	None

Source: Primary data.

Table 13.1. Calculation of Kerosene Actually Consumed

Actual Litres of Kerosene Consumed	Percentage of Sample	No. of Households Based on Sample	Total Kerosene Consumed (litres)
No consumption	15.33	15,772	—
2	54.26	55,824	110,568
4	26.67	27,438	109,752
6	3.74	3,847	23,082
Total kerosene consumed			243,402

Source: Primary data.

$$\begin{aligned}
 \text{The annual expanses on electricity} &= ₹13,717,720 \times 12 \\
 &= ₹164,612,640 \\
 &= ₹16.46 \text{ crore}
 \end{aligned}$$

Kerosene for lightening purpose: Majority of the respondents i.e. 54.26 percent consumed 2 liter kerosene per month. The details of the kerosene used for lighting of the respondents and for the Sonitpur district is given in Table 13 and 13.1 respectively.

$$\begin{aligned}
 \text{Market value of the kerosene consumed per annum} &= 243,402 \times 12 \times \text{Market price per litre} \\
 &= 243,402 \times 12 \times ₹43 \\
 &= ₹125,595,432 \\
 &= ₹12.55 \text{ crore}
 \end{aligned}$$

$$\begin{aligned}
 \text{Cost of kerosene saved annually} &= \text{Annual kerosene saved in litres} \times \text{Market price of kerosene} \\
 &= 7,459,848 \text{ litre} \times ₹43 \\
 &= ₹320,773,464 \\
 &= ₹32.07 \text{ crore}
 \end{aligned}$$

$$\begin{aligned}
 \text{Therefore, amount saved} &= \text{Amount saved} - (\text{Amount spent on electricity} + \text{Amount spent on kerosene}) \\
 &= ₹32.07 \text{ crore} - (₹16.46 \text{ crore} + 12.55 \text{ crore}) \\
 &= ₹3.06 \text{ crore}
 \end{aligned}$$

With the implementation of RGGVY, the annual savings on lighting in Sonitpur district are ₹3.06 crore. It was found that all villagers are provided with subsidised kerosene, the rate of which is ₹14.43 per litre. For the actual amount saved, the market price of kerosene is taken rather than the subsidised price.

Comparison of Economic Price of RGGVY with Net Amount of Saving The net economic price of the RGGVY in relation with the infrastructure is 5.53 crore and the net benefit received by the government by minimised subsidies is about 32.07 crore. The value of the benefit in comparison to the economic price of infrastructure is exceeding by six times. Thus, we can conclude that the value of the RGGVY project is more than its cost.

Further Study

As the article includes only three initial steps of SCBA under UNIDO approach, further study can be done covering the last two steps and environmental aspects of project analysis.

6. Conclusion

The SCBA gives the benefit of the project in terms of economic prices and gives the impact of the project on savings and investments. Through this study, it was found that rural electrification has a significant impact on changes in the standard of living of the villagers. RGGVY project has a positive impact on health, education, women empowerment, income level, etc. It can be concluded that social benefit of the project is more and in future, the government can save the amount spent on subsidised kerosene and can reinvest the amount in some other productive schemes.

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Annexure I

Questionnaire

I am doing a brief survey to find out the income and redistribution impact of Rajiv Gandhi Grameen Vidyutikaran Yojana on the people of Sonitpur district. I would be grateful to you if you could spare a few minutes to participate in it. Thank you for your cooperation.

1. Name of the respondent:
2. Occupation:
3. Whether continue with the same occupation or changed after electrification:
 - (a) Yes
 - (b) No
4. Please state the impact of rural electrification on your social and economic aspects:

Social and Economic Variables	To a Lower Extent	To Some Extent	To a Greater Extent
Impact on education			
Impact on employment			
Impact on income			
Impact on women empowerment			

5. Electronic appliances used by household:
 - Inverter
 - Motor
 - Mobile
 - Television
 - Computer
 - Refrigerator
 - Others
6. What are the energy sources for cultivation?
 - Manual method
 - Diesel generator

- Electricity
 - Combination of both (diesel and electricity)
7. Per month spending by the household on various items:
- Less than ₹2,000
 - ₹2,001–2,500
 - ₹2,501–3,000
 - More than ₹3,001
8. Normal hours of electricity provided:
- Less than 5 hours
 - 5–7 hours
 - 7–10 hours
 - 10–12 hours
 - More than 12 hours
9. Are you the holder of a ration card?
- Yes No
10. Kerosene provided to villagers through public distribution system:
- Less than 6 litres
 - 6.01–8 litres
 - 8.01–10 litres
 - More than 10.01 litres
11. Amount of kerosene saved monthly:
- Less than 2 litres
 - 2.01–4 litres
 - 4.01–6 litres
 - More than 6.01 litres
12. Kerosene actually used for lighting:
- No consumption
 - 2 litres
 - 4 litres
 - 6 litres
 - More than 6 litres
13. Electricity bill paid by each household on a monthly basis:
- Less than ₹80
 - ₹81–120
 - ₹121–160
 - ₹161–200
 - More than ₹201

14. What is the amount of kerosene saved for the RGGVY scheme in terms of rupees?

- Less than ₹40
- ₹41–60
- ₹61–80
- ₹81–100
- More than ₹101