

# Socio-Economic Impact Assessment of Implementation of the Sitio Electrification Program (SEP) of the Batangas II Electric Cooperative, Inc. (BATELEC II)

Jaydel A. Lique<sup>a</sup> and Nickie Boy A. Manalo<sup>b</sup>

*Batangas State University*

## ABSTRACT

This study assesses the socio-economic impact of the Sitio Electrification Program (SEP) within the coverage area of the Batangas II Electric Cooperative, Inc. (BATELEC II), a program that intends to bring sound development to the people in the rural areas. In this study it aims to evaluate the profile of the SEP beneficiaries and the impact of the implementation of the program to the people and community living in the sitios in terms of social, economic, cultural and health. It also seeks to determine the out and outcome of the SEP including the challenges encountered during the implementation of SEP. Moreover, it aims to determine the significant difference on the assessment of SEP when respondents are grouped into profile. Descriptive method of research is used in the conduct of the study with 329 respondents from the SEP beneficiaries and 15 from BATELEC II personnel. Survey and Key Informant Interview (KII) were used in gathering necessary data. Frequency, rank & percentage, weighted mean, one-way analysis of variance and multiple comparison of means are the statistical treatment employed by the researcher.

Study revealed that the implementation of SEP provided high positive impact to it beneficiaries, however, it showed that there is no standard ratio between the SEP output and outcome due to several factors. Right of Way (ROW) problem came out to be the most encountered challenges in the implementation of SEP. Sustainable Action Plan was proposed as the final output of the study which is deemed to be beneficial both for the SEP beneficiaries in providing them better quality of life and for BATELEC II in the improvement and growth of its business operations.

**Keywords:** *socio-economic, assessment, impact, electrification and sitio*

## 1. INTRODUCTION

Electrification in the rural areas was initially aimed for irrigation pumps and tube-wells, agro-based industries and serving domestic and commercial loads of only those residents, which fall right alongside the electrical distribution facilities built for irrigation purposes. To date, electricity made available through different areas, is intended to use for all possible applications that serve the purpose of improved living conditions of rural populace. The Sitio/rural electrification has been identified as one of the four priority areas in order to ensure increasing growth and bringing of pro-poor orientation in the growth process, as has been mentioned in the National Poverty Reduction Strategy Report, 2002. Introducing electricity into different consumers - domestic/household, industrial, irrigation equipment, commercial, street light and office use, provides the necessary infrastructure for accelerated economic activities as well as creating environment for realizing human capabilities. Since 1978 more than a thousand-fold increase (1237 times) in terms of number of services connected reveals as an annual average growth rate

of 40%. (hrdc-bd.com)

Likewise, in many studies conducted in different countries about rural electrification, it appeared that electricity has brought significant impact to the different facets of people's life. This is the reason why even the most developed country, the United States of America has currently an existing organization that represent more than 900 electric cooperatives known as the National Rural Electric Cooperatives (NRECA) because they are the one responsible to pave the way for the development of the rural areas in their country.

Moreover, electricity also generates employment. The impact on employment was both direct and indirect. In agriculture, an estimated 1.1 million persons are directly involved in farmlands using rural electricity connected irrigation equipment. Currently, 63,220 industries using rural electricity employ 983,829 persons; and electrified industries, on average, generate 11 times more employment than the non-electrified industries. Rural and wholesale shops using rural electricity employ 848,630 persons. There has been direct employment of 16,223 persons in the

PBSs. More so, women in the electrified compared to those in the non-electrified households are involved more in household level income-generation activities and depict better re-allocation of time for remunerative employment; unemployment rate is relatively low in the electrified households; and relatively higher share of non-agricultural employment in the electrified households indicates modernization effect of electricity on occupation. On the top of all these, there has been an enormous spill-over effect of rural electrification on employment in various support-services. (hdrc-bd.com)

For many years in the past, different private distribution utilities in the Philippines have ignored the rural areas. This attributed the very low progress and development of the rural folks since business hubs and other economic activities preferred to locate in urban areas where electricity can be easily accessed while the unavailability of electricity in rural areas kept the economies entirely and exclusively dependent on agriculture.

While this endeavor posts significant challenges, the Philippine government fully supported the rural electrification initiatives by allocating huge funds thru the Department of Energy (DOE) and NEA. The ECs on the other hand have implemented this electrification program based on their coverage areas which intended not only to energize the barangay level but also the sitios which are considerably the remotest in their respective area.

BATELEC II, thru the Sitio Electrification Program (SEP) has fulfilled its mission of electrifying the remote and unviable places in different cities and municipalities in the province Batangas under its franchise area which were identified by the local government thru barangay officials. These sites and localities are those that previously suffered from the feeling of both isolation and desolation because they were deprived of the benefits and privileges that electricity could offer.

For the past years of BATELEC II's implementation of SEP and for the enormous amount of support that the government spent for this effort, it is indeed necessary to assess whether the program has really served its purpose of bringing sound development and recognizable welfare to the beneficiaries of the Sitio Electrification Program.

## 2. OBJECTIVES

This research determined the profile of the SEP beneficiaries in terms of household type, annual family income, source of income, home ownership classification, housing type characteristics and geographical location; the output and outcome of SEP, the socio-economic impact of SEP in terms of social, economic, cultural and health; and the

challenges encountered during the SEP implementation which led to the formulation of the proposed Sustainability Action Plan.

## 3. MATERIALS AND METHODS

Descriptive quantitative research was employed in conducting the research where the respondents are identified through random sampling fishbowl technique. Respondents are the 329 SEP beneficiaries and 15 BATELEC II employees. In gathering the data, both survey and Key Informant Interview (KII) were done. The questionnaires were validated by the adviser and the panel of evaluators. To test the reliability of the questionnaires as measured by Cronbach Alpha, pilot test was conducted to 50 beneficiaries of the nearest and most accessible SEP in Lipa City.

Frequency-percentage distribution was used to describe the respondent's profile and the challenges encountered during the implementation of SEP. Mean was applied to determine the impact of SEP on social, economic, cultural and health of the respondents while analysis of variance (ANOVA) to find out the differences between the profile of the SEP beneficiaries in relation to the assessment of the socio-economic impact of SEP.

## 4. RESULTS AND DISCUSSIONS

### 4.1. Profile of SEP beneficiaries

Table 1 presents the distribution of respondents in terms of household type.

**Table 1. Distribution of Respondents in Terms of Household Type**

Household Type	Frequency	Percentage
One person	16	4.9
Couple without children	26	7.9
Couple with children	206	62.6
Lone parent	38	11.6
Extended family	43	13.1
Total	329	100

As shown in table 1, more than half of the household type of the respondents that represent the SEP beneficiaries of BATELEC II are couple with children. It accounted for 62.6 percent of the total population, outnumbering the other four groups of household type. On the other hand, with just 4.9 percent of the population, one-person households account for the lowest proportion of SEP recipients.

Table 2 presents the distribution of respondents in terms of annual family income.

**Table 2. Distribution of Respondents in Terms of Annual Family Income**

Annual Family Income	Frequency	Percentage
P40,000.00 and below	201	61.1
P40,001.00 – 59,999.00	30	9.1
P60,000.00 – P99,999.00	45	13.7
P100,000.00 – P249,999.00	37	11.2
P250,000.00 and above	16	4.9
<b>Total</b>	<b>329</b>	<b>100</b>

Table 2 shows that majority of the respondents belong to annual family income bracket of P40,000.00 with 61.1 percent equivalent to 201 respondents. Despite the fact that the average annual family income in CALABARZON is estimated to be Php384, 000.00, the majority of SEP beneficiaries are in the lowest bracket of P40, 000.00 and below. However, the result is not surprising, given that SEP recipients were mostly from marginalized sector in the coverage area of BATLEC II.

Table 3 presents the distribution of respondents in terms of source of income.

**Table 3. Distribution of Respondents in Terms of Source of income**

Source of Income	Frequency	Percentage
Agriculture	107	32.5
Fishing	11	3.3
Construction	48	14.6
Transportation	35	10.6
Manufacturing	13	4.0
Trading	16	4.9
Other Services/ Business activities	99	30.1
<b>Total</b>	<b>329</b>	<b>100</b>

Agriculture provides the majority of the respondents' source income (32.5%) while fishing is the least respondents' source income (3.3%).

Agricultural labor is normally concentrated in remote areas such as sitios, which explains the outcome. Surprisingly, other services/business activities is the second highest source of income for

SEP recipients which based on the result is composed sari-sari stores, barangay officials and functionaries and local employment within and outside their respective municipalities, among others. Aside from fishing with the lowest percentage as the source of income, manufacturing with just 4.0 percent and trading with 4.9 per cent seemed to be not the ideal yet of source of living of the residents in the sitios subject of this study. While the location of sitios under SEP are usually viable for certain kinds of business, it can be presumed that the number of years after SEP has been introduced, such period of time is still insufficient to provide much manufacturing and trading businesses in the area.

Table 4 presents the distribution of respondents in terms of home ownership classification.

**Table 4. Distribution of Respondents in Terms of Home Ownership Classification**

Home Ownership Classification	Frequency	Percentage
Full Ownership	260	79
Partial Ownership	58	17.6
Rented	11	3.3
<b>Total</b>	<b>329</b>	<b>100</b>

As shown, majority of the respondents have the full ownership of their house comprising of 79 per cent or 260 out of 329 respondents. While 61.1 percent of the respondents have an annual family income of P40,000.00 or less, as shown in Table 2, majority of their income is derived from agricultural jobs, as shown in Table 3, the study revealed a rather positive result, suggesting that low-income earner families in the sitios are not deprived with the opportunity to own a house. This also suggests the inherent resourcefulness and ingenuity of the people from the sitios to have their own house. It was also a good result that only 3.3 per cent or 11 of the 329 respondents are renting a house.

Table 5 presents the distribution of respondents in terms of housing type characteristics.

**Table 5. Distribution of Respondents in Terms of Housing Type Characteristics**

Housing Type Characteristics	Frequency	Percentage
Bungalow	297	90.3
Multi-storey	11	3.3
Apartment	5	1.5
Single Attached	15	4.6
Townhouse	1	0.3
<b>Total</b>	<b>239</b>	<b>100</b>

As illustrated above, 90.3 per cent of the respondents are living in bungalow. Only 4.6 per cent are living in single attached, 3.3 percent in multi-storey, 1.5 per cent in apartment. Remarkably, there is one respondent in townhouse.

Based on the result of the study, majority of the respondents have bungalow type of housing. It implies that it is the most common form of housing in their area because of the very low income that prevented them from building a multi-story or more luxurious dwelling house. Only those who fall into the highest annual family income class, as seen in Table 4, are likely to live in multi-storey and townhouse housing.

Table 6 presents the distribution of respondents in terms of geographical location.

**Table 6. Distribution of Respondents in Terms of Geographical Location**

Geographical Location	Frequency	Percentage
District 2 ( <i>Lobo, Mabini, Tingloy</i> )	77	23.4
District 3 ( <i>Alitagtag, Cuenca, Laurel, Malvar, Mataasnakahoy, Tanauan City</i> )	49	14.9
District 4 ( <i>Padre Garcia, Rosario, San Jose, San Juan, Taysan</i> )	158	48
District 6 ( <i>Lipa City</i> )	45	13.7
<b>Total</b>	<b>329</b>	<b>100</b>

District 4 has the highest percentage because aside from the fact that it is composed of 5 municipalities, the combination alone of the municipalities San Juan with 666 household connections corresponding to 98 respondents and Rosario with 301 household connections corresponding to 44 respondents, has already constituted 43.4 percent of household connections of the total SEP beneficiaries as shown in Table 1.

Since District 6 is marked by Lipa City alone with only 304 SEP beneficiaries, consequently, it represented the lowest number of respondents with only 13.7 percent or 45 out of the total 329 respondents compared with Districts 2 composing of 3 municipalities, District 3 composing of 5 municipalities and 1 city and District 4 composing of 5 municipalities.

#### 4.2. Output and Outcome of SEP

Table 7 presents the output and outcome of the implementation of SEP

**Table 7. Output and Outcome of the Implementation of SEP**

Municipality	Output			Outcome
	Installed Transformer (pcs)	Erected Pole (pcs)	Installed Conductor (m)	Energized Households
Alitagtag	3	56	5,821	5
Cuenca	11	105	11,532	64
Laurel	0	4	382	9
Lipa City	7	83	8,189	304
Lobo	11	216	36,592	323
Mabini	5	73	10,205	78
Malvar	1	10	804	20
Mataasnakahoy	1	57	4,736	95
Padre Garcia	3	50	7,225	6
Rosario	25	483	77,599	301
San Jose	4	59	7,281	5
San Juan	65	1,244	168,952	666
Talisay	0	8	924	0
Tanauan City	7	165	21,398	138
Taysan	17	319	39,607	97
Tingloy	4	131	21,543	116
<b>Total</b>	<b>164</b>	<b>3,063</b>	<b>422,790</b>	<b>2,227</b>

The output and outcome of SEP showed that the municipality of San Juan that has the highest output with 65 units of installed transformer, 1,244 erected poles and 168,952 meters of mounted conductors. Consequently, it was in this area that has also the highest outcome of 666 household connections. While the municipality of Rosario is second with regards to the highest output with 25 units of installed transformer, 483 pieces of erected poles and 77,599 meters of mounted conductors, it only ranked no. 4 in terms of outcome with a total of 301 household connections next to Lobo and Lipa City which comparably have the lesser number of installed, erected and mounted electrical materials. Same is true with the municipality of Taysan which is ranked no. 3 in terms of output with 17 units of installed transformer, 319 pieces of erected poles and 39,607 meters of mounted conductors, but it only fell no. 7 in terms of outcome with a total of just 97 household connections.

Moreover, it was assessed in the study that the municipality of Laurel has the least output with no installed transformer, only 4 pieces of erected poles and 382 meters of mounted conductors but has 9 household connections higher than of Padre Garcia with 6, San Jose and Alitagtag with both 5 household connections respectively. Apparently, it shows that there is no common ratio between the number of installed transformers / erected poles/ installed, conductors and the number of energized households.

#### 4.3. Socio-economic Impact of SEP

Table 8 presents the assessment on the social impact of SEP of BATELEC II

**Table 8. Assessment on the Social Impact of SEP of BATELEC II**

	Indicators	Weighted Mean	Verbal Interpretation
1	Improved the way people live on a day to day basis.	4.45	High Impact
2	Improve the way people work on a day to day basis.	4.40	High Impact
3	Enhanced the freedom and capacity of the youth play.	4.32	High Impact
4	Improved how people interact with one another.	4.38	High Impact
5	Strengthened the cohesion of the community.	4.25	High Impact
6	Increased the services provided to community.	4.26	High Impact
7	Ensured the availability of food.	4.16	High Impact
8	Kept a serene environment.	4.22	High Impact
9	Increased the opportunity for physical safety.	4.30	High Impact
10	Maintained access and control over resources.	4.29	High Impact
11	Increased the opportunity to improve participation in political system especially for the decisions that may affect their lives.	4.14	High Impact
12	Widened perception about security and safety.	4.29	High Impact
13	Provided clarity of perception about fears and anxiety.	4.23	High Impact
14	Developed aspiration about the future of the community.	4.25	High Impact
15	Developed aspiration for the future of the youth.	4.31	High Impact
	<b>COMPOSITE MEAN</b>	<b>4.10</b>	High Impact

(Legend: 4.50 – 5.0 Very High Impact, 3.50 – 4.49 High Impact, 2.50 – 3.49 Moderate Impact, 1.50 – 2.49 Minimal Impact, 1.0 – 1.49 Very Low Impact)

Result showed that the implementation of SEP has high positive impact on all indicators of social aspect with a composite mean of 4.10 which was influenced by indicator 1 pertaining to the improvement on the way people live on a day to day basis with a highest weighted mean of 4.45 and indicator 11 pertaining to increase in the opportunity to improve participation in political system especially for the decision that may affect their lives with the lowest weighted mean of 4.14.

The result of the survey on the social impact of the sitio electrification is consistent with the outcome of different studies which can be concluded that the objectives of SEP have been met and yielded more opportunities for improved quality of life of the beneficiaries.

Table 9 presents the assessment on the economic impact of SEP of BATELEC II

**Table 9. Assessment on the Economic Impact of SEP of BATELEC II**

	Indicators	Weighted Mean	Verbal Interpretation
1	Created business opportunities.	4.40	High Impact
2	Created job/employment opportunities.	4.34	High Impact
3	Increased the level/quantity of workload.	4.19	High Impact
4	Increased the amount of income in business.	4.24	High Impact
5	Increased the amount salary in employment.	4.12	High Impact
6	Increased the amount of savings.	3.98	High Impact
7	Increased the amount of disposable income.	4.09	High Impact
8	Increased the construction of business facility.	4.26	High Impact
9	Made the availability of machineries/equipment for business.	4.20	High Impact
10	Made the availability of vehicles.	4.09	High Impact
11	Increased the value of properties like house and land.	4.12	High Impact
12	Provided opportunity for advancement to create new and better products.	4.17	High Impact
13	Increased opportunity for advancement to create new and better services.	4.18	High Impact
14	Increased opportunity for advancement to do things in easier ways.	4.28	High Impact
	<b>COMPOSITE MEAN</b>	<b>3.96</b>	High Impact

(Legend: 4.50 – 5.0 Very High Impact, 3.50 – 4.49 High Impact, 2.50 – 3.49 Moderate Impact, 1.50 – 2.49 Minimal Impact, 1.0 – 1.49 Very Low Impact)

As shown in the above table that the implementation of SEP has high positive impact on all indicators of economic aspect with a composite mean of 3.96 which was influenced by indicator 1 pertaining to creation of business opportunities with a highest weighted mean of 4.40 and by indicator pertaining to the increased amount of saving with the lowest weighted mean 3.98.

The result of the survey on economic impact is also consistent with the objective of R.A 10531 (2013) which promotes the sustainable development in the rural areas through rural electrification that is why SEP has been constantly included in the economic and development framework of the government as one among priority programs because of the government's strong conviction that it will give

equal opportunity for both urban and rural dwellers.

Table 10 presents the assessment on the cultural impact of SEP of BATELEC II

**Table 10. Assessment on the Cultural Impact of SEP of BATELEC II**

	<b>Indicators</b>	<b>Weighted Mean</b>	<b>Verbal Interpretation</b>
1	Maintained the custom about close family ties.	4.43	High Impact
2	Maintained the custom about respect for elders.	4.31	High Impact
3	Maintained the custom about respect for women.	4.34	High Impact
4	Maintained the native language/dialect.	4.21	High Impact
5	Provided opportunity to increase choices on hobbies.	4.23	High Impact
6	Provided opportunity to increase choices on fashions.	4.22	High Impact
7	Increased level of awareness to gender equity.	4.26	High Impact
8	Offered opportunity for conversion of agricultural land to residential area.	4.18	High Impact
9	Offered opportunity for conversion of agricultural land to business/ commercial area.	4.13	High Impact
10	Offered opportunity for conversion of agricultural land to a tourist destination area.	4.16	High Impact
	<b>COMPOSITE MEAN</b>	<b>4.08</b>	High Impact

(Legend: 4.50 – 5.0 Very High Impact, 3.50 – 4.49 High Impact, 2.50 – 3.49 Moderate Impact, 1.50 – 2.49 Minimal Impact, 1.0 – 1.49 Very Low Impact)

As reflected in table 10, the SEP beneficiaries of agreed that sitio electrification has a high positive impact in their culture as it has a result of 4.08 composite mean which was influenced by indicator 1 which pertains to maintaining the custom about family ties having the highest weighted mean of 4.43. Accordingly, the beneficiaries of SEP are very vocal with their appreciation to the rural electrification because even if some of their immediate family members and relatives have migrated to other places or working abroad, their constant communication with them through the use of cellular phone, internet and social media kept their close family ties intact.

On the other hand, the indicator with the lowest weighted mean pertains to offered opportunity for the conversion of agricultural land to business/ commercial area. While SEP has introduced development in some sitios, it is safe to assume that conversion of agricultural land to

commercial and tourist destination of other sitios would still require quite some time especially those in the remotest mountainous area.

Table 11 presents the assessment on the health impact of SEP of BATELEC II

**Table 11. Assessment on the Health Impact of SEP of BATELEC II**

	<b>Indicators</b>	<b>Weighted Mean</b>	<b>Verbal Interpretation</b>
1	Improved nutrition/health condition of every individuals.	4.27	High Impact
2	Decreased in number of infirmities.	4.11	High Impact
3	Offered opportunity to increase activities for physical fitness	4.28	High Impact
4	Offered opportunity to improve psychological stability.	4.22	High Impact
5	Offered opportunity to improve sound judgement.	4.13	High Impact
6	Maintained peace and order within the community.	4.24	High Impact
7	Provided accessibility to social services in health program.	4.24	High Impact
8	Provided accessibility to social services in education program.	4.31	High Impact
9	Provided freedom to exercise of religious faith and belief.	4.34	High Impact
10	Uplifted the spiritual wellbeing.	4.33	High Impact
	<b>COMPOSITE MEAN</b>	<b>4.0</b>	High Impact

(Legend: 4.50 – 5.0 Very High Impact, 3.50 – 4.49 High Impact, 2.50 – 3.49 Moderate Impact, 1.50 – 2.49 Minimal Impact, 1.0 – 1.49 Very Low Impact)

Manifested in table 11 that SEP has high positive impact in the health aspects the SEP beneficiaries of BATELEC II with a composite mean of 4.0. Indicator 9 which pertains to provision of freedom to exercise religious faith and belief has the highest weighted mean of 4.34 while indicator 2 that concerns the decreased in number of infirmities has the lowest weighted mean of 4.11.

Based on the conducted Key Informant Interview (KII) the presence of electricity has brought huge impact to the lives of SEP beneficiaries in terms of their freedom to exercise their religious faith and belief since the conduct of different religious activities is not limited during day time alone. The Flores the Mayo, the Novena Masses during barangay Fiesta, the Simbang Gabi during Christmas season for the Catholic Christians and other Worship activities of other different sects can be done even in the remotest barangay and sitios during nighttime through the entrance of electricity under SEP. He said that the celebration and conduct of all those religious activities were even improved through the use better lightings, good sound system and visual aids like screen projectors or tv monitor and that may not be

possible without electricity.

#### 4.4. Difference the in Socio-economic Impact Assessment

Table 12 presents significant difference in socio-economic impact assessment of SEP when respondents are grouped according to profile.

**Table 12. Difference on the assessment of the respondents on the socio-economic impact assessment in terms of household type**

Variables	p-values	Computed f-values	Decision on Ho	Verbal Interpretation
Social Impact	.158	1.67	Failed to Reject	Not Significant
Economic Impact	.122	1.84	Failed to Reject	Not Significant
Cultural Impact	.272	1.29	Failed to Reject	Not Significant
Health Impact	.181	1.57	Failed to Reject	Not Significant

It can be seen that the p-values of all indicators are greater than .05 level of significance. This indicates the decision of failed to reject the null hypothesis which means that there is no significant difference on the assessment of the respondents when they are grouped according to household type. This implies that the responses would not differ regardless of the household type of the respondents.

Based on the classification of the household type, most of the respondents are couple with children which comprised 62.6% of the total sample size. The other classification comprises the remaining 37.4%. These merely signify that the responses are dominated by the respondents with household type classification of couple with children. This segment clearly states almost the same perspective towards the socio-economic impact of the SEP project in terms of social, economic, cultural and health factors.

Table 13 presents significant difference in socio-economic impact assessment of SEP when respondents are grouped according to profile.

**Table 13. Difference on the assessment of the respondents on the socio-economic impact assessment in terms of annual family income**

Variables	p-values	Computed f-values	Decision on Ho	Verbal Interpretation
Social Impact	.037	2.59	Reject	Significant
Economic Impact	.001	4.51	Reject	Significant
Cultural Impact	.014	3.18	Reject	Significant
Health Impact	.034	2.63	Reject	Significant

Table 13 has shown that all the variables of the socio-economic impact have p-values of less than 0.05 level of significance which point out the

decision of rejecting the hypothesis.

Access to electricity has a significant impact on household consumption patterns and it implies that there is a causal relationship between electricity and household consumption which equate to income. Electricity is now a necessity which creates demand to household with different income classification. The income is force to reclassify to things which are part of the strings of socialization. The changes in people behavior classification makes the assumption that the diversification of perspectives is a result of shifting individuals' behavior with regard to their own electricity consumption. Moreover, With the presence of electricity and with the capacity to pay through the generated income of the family, the purchase of equipment operated by electricity and materials that provide comfort and convenience creates positive health impact to beneficiaries. The diversity of the responses was generated through the differences in terms of annual family income.

Table 14 presents significant difference in socio-economic impact assessment of SEP when respondents are grouped according to profile.

**Table 14. Difference on the assessment of the respondents on the socio-economic impact assessment in terms source of income**

Variables	p-values	Computed f-values	Decision on Ho	Verbal Interpretation
Social Impact	.383	1.065	Failed to Reject	Not Significant
Economic Impact	.019	2.579	Reject	Significant
Cultural Impact	.059	2.049	Failed to Reject	Not Significant
Health Impact	.003	3.352	Reject	Significant

It can be seen that the indicators of social and cultural impact pertaining to socio-economic impact resulted to p-values greater than .05 level of significance. This indicates the decision of failed to reject the null hypothesis which means that there is no significant difference on the assessment of the respondents when they are grouped according to source of income of the respondents. This may imply that the responses would not differ regardless of the household type of the respondents.

The idea behind the findings that there is no variation in the responses towards social and cultural impact when respondents are grouped according to source of income is that the respondents do have common sharing of the same socialization structure and common cultural practices, which creates homogenous perspective to commonly aware stimuli. This creates an implication to the organization to not prioritize these indicators in performing action-driven strategies to create better services to beneficiaries.

On the other hand, the indicators of economic and health impact pertaining to socio-economic impact resulted to p-values which are all lesser than .05 level of significance having the decision of failed to reject the null hypothesis which means that there is no significant difference on the assessment of the respondents when they are grouped according to source of income of the respondents.

The variation of the responses happens due to diverse groupings of the respondents in terms of source of income which have significant and direct correlation to individual earnings. Furthermore, the acquisition of goods that provide comfort and convenience and equipment that runs on electricity has a favorable impact on recipients' health since they are available and the family has the financial means to pay for them. The variations in annual family income were what led to the variety of responses.

Table 15 presents significant difference in socio-economic impact assessment of SEP when respondents are grouped according to profile.

**Table 15. Difference on the assessment of the respondents on the socio-economic impact assessment in terms of home ownership classification**

Variables	p-values	Computed f-values	Decision on Ho	Verbal Interpretation
Social Impact	.151	1.90	Failed to Reject	Not Significant
Economic Impact	.13	2.05	Failed to Reject	Not Significant
Cultural Impact	.642	.443	Failed to Reject	Not Significant
Health Impact	.627	.468	Failed to Reject	Not Significant

It can be seen that all indicators pertaining to socio-economic impact resulted to p-values which are all greater than .05 level of significance. This signifies that there is no substantial difference in the respondents' ratings when they are categorized according to home ownership classification, indicating that the decision to reject the null hypothesis was unsuccessful. This would imply that the results wouldn't change depending on the respondents' home ownership classification. The result merely indicates that respondents who fall under the category of couple with children are the ones who react most frequently. Additionally, respondents who fell under the category of full ownership dominated the house ownership category.

Table 16 presents significant difference in socio-economic impact assessment of SEP when respondents are grouped according to profile.

**Table 16. Difference on the assessment of the respondents on the socio-economic impact assessment in terms housing type characteristics**

Variables	p-values	Computed f-values	Decision on Ho	Verbal Interpretation
Social Impact	.695	.556	Failed to Reject	Not Significant
Economic Impact	.851	.34	Failed to Reject	Not Significant
Cultural Impact	.553	.759	Failed to Reject	Not Significant
Health Impact	.56	.747	Failed to Reject	Not Significant

Based on the result, it can be seen that all indicators resulted to p-values which are all greater than .05 level of significance. This signifies that there is no substantial difference in the respondents' ratings when they are categorized according housing type characteristics, indicating that the decision to reject the null hypothesis was unsuccessful. This would imply that the results wouldn't change depending on the respondents' home ownership classification.

Similar to homeownership classification, most respondents assessing the socio-economic impact of SEP when grouped into housing type characteristics may merely indicate that respondents are also those who fall under the category of couple with children who react most frequently. Thus, it is not surprising that there is no significant difference in the assessment of socio-economic impact in terms of social, economic, cultural, and health concerns when they are grouped in housing type. Further, the bungalow home type features have the highest frequency of 297 and an equivalent proportion of 90.3%.

Table 17 presents significant difference in socio-economic impact assessment of SEP when respondents are grouped according to profile.

**Table 17. Difference on the assessment of the respondents on the socio-economic impact assessment in terms geographical location**

Variables	p-values	Computed f-values	Decision on Ho	Verbal Interpretation
Social Impact	.001	5.543	Reject	Significant
Economic Impact	.002	5.096	Reject	Significant
Cultural Impact	.000	8.442	Reject	Significant
Health Impact	.000	12.933	Reject	Significant

Based on the findings indicated in the table, all indicators have a p-values of less than .05 significance level with the decision of rejecting the null hypothesis. This result illustrates that there is a



significant difference on the assessment on the socio-economic impact when respondents are grouped according to geographical location.

Based on the data reflected in the geographical classification of the respondents, most of them are situated in the upland, mountainous and coastal areas while others are located in the rural with geographically distant sitios. This denotes that the diversity on the perspectives arises due to the traditional socialization set-up of the respondents which are still bounded by religion, wealth, family lifestyle and life events involving community and society as a whole. There is also variation in SEP beneficiaries' works/job due to geographic setup that may result in diversity in responses on matters pertaining to the economic impact of the SEP project. SEP beneficiaries are also sharing common thread in their circle that is not shared with people outside the community. This creates an implication to the organization to develop a more culturally sensitive approaches to other monitoring program related to SEP project.

#### 4.5. Challenges Encountered

Table 18 presents the challenges encountered during the implementation of SEP.

**Table 18. Challenges encountered in the implementation of SEP**

Challenges	Frequency	Rank
Right of Way (ROW) problem	13	1
Difficulty of accessing the location of SEP	6	4
Difficulty of transportation of materials to the project site	12	2
Non-compliance of the beneficiaries to LGU requirements	10	3
Unavailability of housewiring installation	5	5.5
Non-standard housewiring installation	5	5.5
Unavailability of project materials	2	9
Insufficient number of manpower	4	7
Political intervention	2	9
Others	2	9

Result showed that ROW problem was ranked as No. 1 challenge encountered during the implementation of SEP followed by difficulty of transportation of materials to the project site with a frequency of 13 and 12 respectively. Non-compliance of the beneficiaries to LGU requirement was third among the top challenges in the implementation of SEP with a frequency of 10.

As explained during KII, Right of Way Problem and Difficulty of Transportation of Materials to the Project Site are normally the challenges that are expected to be the most frequently encountered by BATELEC II considering that the locations of SEP are in the remotest and non-viable farflung places in the coverage area of BATELEC II. Non-compliance of the beneficiaries to LGU requirement is similar to what has been mentioned in NEA Memorandum (2016) that while the housewiring materials, kWh meters, service drops, among others are already available and partially installed, the recipient consumers who were mostly marginalized cannot immediately secure the required compliances from the LGU prior to connection because securing them requires corresponding payments or fees.

#### 4.6. Proposed Sustainability Action Plan

As a result of the study, the researcher proposed a Sustainability Action Plan for Sitio Electrification Program based on the findings of this study. This action plan which is comprised of three main required components such as goals, actions and actions plan that can be useful to BATELEC II to improve its operational preparedness in its future implementation of SEP.

##### 4.6.1. Goals

This is the first component of the proposed Sustainability Action Plan which is the first explains the community or organization wants to achieve. The researcher has set four (4) goals which includes Continuous implementation of SEP, Expansion of SEP for sustainable livelihood program, Facilitation of timely household energization thru partnership with LGUs and other government agencies and lastly is the formulation of mitigation policy/plan to avert from/ minimize the chances of encountering the perennial challenges of SEP implementation. All of these for goals encompass the significant findings of the study that will be very significant to BATELEC II for a more organize and systematic implementation of SEP in the future.

##### 4.6.2. Actions

The second component are the actions which consist of specific projects or activities that will help to achieve the goals. In the case of the proposed Sustainability Action Plan, the four (4) set goals have corresponding sets of activities that are deemed necessary to realize the achievement of each goal. All the activities enumerated in the said proposed action plan is a result of a comprehensive discussion with BATELEC II SEP Focal Person and Area Managers of BATELEC II who are known to be expert in different facets of the implementation of SEP within the coverage area of BATELEC II. Each activity was scrutinized, evaluated and even consulted with the focal person and area managers to ensure that they are applicable and doable in facilitating a more

systematic implementation of SEP that would provide greater benefits to both SEP beneficiaries and BATELEC II in its future implementation of SEP.

#### *4.6.3. Action Plan*

The last component is the action plan which describes how the mitigation actions will be implemented including how those actions will be administered and incorporated in the planning mechanism. It is in this component that the researcher collected the ideas, suggestion and recommendation of the focal person and area managers and incorporated them in the action plan. The collective ideas out of the comprehensive discussion helped to identify who will be responsible in the execution of the set mitigation actions. The responsible units were identified which are represented by different departments of BATELEC II that will served as the actor or implementer of the actions to be taken in achieving the target goal. To be able to give a clearer and deeper understanding about the meaning of the action plan, the expected outcome for both beneficiaries and BATELEC II were also determined. These foreseen outcomes enumerated in the action plan would promote an ardent desire to the implementer of SEP to go beyond their normal activity as it lays down the noble benefits of the program not only for the beneficiaries of SEP but also for the growth of the business operations of BATELEC II

#### *4.6.4. Work Plan*

The work plan covers a 3-year activity for the Fiscal Year 2023-2025. Reflected are the actions/activities intended for the purpose the target deadlines and expected deliverables.

#### *4.6.5. Budgetary Requirement*

The estimated expense for the whole duration of activities is illustrated in the proposed Sustainability Action Plan which shall be charged in the Institutional Budget/Fund of BATELEC II.

## **5. CONCLUSION**

After the assessment, analysis and interpretation of variables, the following conclusions are drawn based on the findings of the study:

#### *5.1. Profile of the SEP beneficiaries*

Majority of the respondents are couple with children, with a family income of Php40,000 and below, with agricultural work, living in a fully

owned bungalow house from municipalities 4<sup>th</sup> District of Batangas.

#### *5.2. Outputs and Outcome of SEP*

The Outputs of SEP implementation are installed transformer, erected poles and installed conductors while the Outcome is the energized households.

#### *5.3. Assessment of the Socio-economic Impact of SEP*

The respondents agreed that the implementation of SEP has high impact on the socio-economic in terms of social, economic, cultural and health.

#### *5.4. Difference in the assessment of Socio-economic impact of SEP when grouped according to profile*

Significant differences were observed in the socio-economic impact assessment when respondents are grouped according to annual family income and geographic location but there is no significant difference when respondents are grouped according to household type, home ownership classification and housing type characteristics. However, when grouped according to source of income, there is significant difference in in terms of economic and health impact but there is no significant difference in terms of social and cultural impact.

#### *5.5. Challenges encountered*

The challenges encountered during the implementation of SEP are Right of Way (ROW) problem, difficulty of transportation of materials to the project site, non-compliance of the beneficiaries to LGU requirements, difficulty of accessing the location of SEP, unavailability of housewiring materials, non-standard housewiring installation, insufficient manpower, unavailability of projects materials and political intervention.

#### *5.6. Proposed Sustainable Mitigation Practices*

Based on findings, a Sustainability Action Plan was proposed.

## **6. RECOMMENDATION**

Based on the findings and conclusions of the study, presented are recommendations for better

implementation of SEP of BATELEC II in the future.

BATELEC II may expand the implementation of SEP by integrating the sustainable livelihood program as part of its Corporate Social Responsibility.

To maximize the number of household connections and to facilitate a quicker execution SEP activities and energization of the houses of the beneficiaries, BATELEC II may consider to initiate an inter-agency partnership and come up to an agreement to address the factors that delays the accomplishment of SEP.

To prevent or at least lessen the probability of encountering the perennial challenges in the execution of SEP, BATELEC II may develop strategic plan or internal policy using its available data from the past years of SEP implementation. Collaboration with different concerned government agencies may be done when necessary.

BATELEC II may consider the adoption of the researcher's proposed Sustainable Action to facilitate better implementation of SEP in the future and to maximize the benefits that the program would offer not only for the SEP beneficiaries but also for the growth of its business operations.

## REFERENCES

- Dhaka, 2022, Economic and Social Impact Evaluation Study of the Rural Electrification Program in Bangladesh. Retrieved from [13. Economic and Social Impact Evaluation Study of Rural Electrification Program in Bangladesh.pdf \(hdrc-bd.com\)](#)
- Navarro, Adoracion M. (2013). Cost Efficiency and Effectiveness of the Sitio and Household Electrification Program. Retrieved from URL <https://pidswebs.pids.gov.ph/CDN/PUBLICATIONS/pidsdps1332.pdf>
- Beyond the Basics. Best Practices in Local Mitigation Planning. Retrieved from URL <http://mitigationguide.org/>

## Acknowledgements

The researcher expresses his sincerest appreciation to the Batangas States University CABEIHM Graduate School panel of experts, **Bendalyn M. Landicho Ph.D., AFBE, Teodorica G. Ani, Ph.D., AFBE, Realiza M. Mame, Ph.D, Robert S. Dipasupil, DBA.** and **Ian Jim S, Laqui, MBA.**, for unselfishly guiding the researcher to come up with a quality research paper. An earnest and heartfelt gratitude is especially conveyed to the researcher's advisor, **Nickie Boy Manalo, DBA, CPME,** for showing his unceasing patience and understanding in providing the researcher the essential advice, valuable time, and constant guidance throughout the completion of this research. Thank you very much and God bless us all!