



## Research Article

# SOLAR POWERED STREET LIGHT FOR SAPANG PATAY

**Dexter S. Faustino**<sup>1</sup>

<sup>1</sup>Electrical, Industrial Automation, HVAC-R Technology Department College of Industrial Technology Bulacan State University, City of Malolos, Bulacan, Philippines

Correspondence should be addressed to **Dexter S. Faustino**

Received February 13, 2017; Accepted February 24, 2017; Published March 16, 2017;

Copyright: © 2017 **Dexter S. Faustino** et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

**Cite This Article:** Faustino, D. (2017). Solar powered street light for Sapang Patay. *Advances in Engineering & Scientific Research*, 3(1). 1-4

## ABSTRACT

An imperative piece of equipment that is vital to a community is a Street Light. It will provide illumination and safety for the people of the community. However, most of the street lights are powered by the local electric company and are somehow not possible for remote locations. The Solar powered street light is an agreeable solution for the problem.

The primary concern of the project is to design and construct a solar- powered street lamp that will be used in Sapang Patay, San Isidro II, Paombong, Bulacan, a remote location of mostly fishponds.

The project aims to illuminate the streets of Sapang Patay through the installation of solar powered street light and provide its residents a sense of being safe throughout the night. An experiment and constant monitoring was conducted to check if the solar panel is charging.

The result of the project has a positive response from the community of Sapang Patay. They now enjoy the street light and can now freely walk at night without any worries. The solar powered street lamp is a self- sustaining device. The device provides a reliable and enhanced alternative to a current street lighting system.

**KEYWORDS:** Solar Powered, Solar Panel, Street Light, Illumination, Charging.

## INTRODUCTION

According to A. Hurst of SOL Inc., “without access to electricity, nearly 1.6 billion people, or 30% of the world’s population, do not have reliable street lighting”. A Street light is a proven piece of equipment to enhance the safety, comfort, educational capability, commercial and social life of a community. A monumental demand for electrical power for industrial use serves as a big hindrance to the propagation of the street light especially in the Philippines. An acceptable solution to this problem is the provision of a reliable and low-cost type of lighting system that does not require power from the local power companies.

A Solar powered street light is the best solution for providing outdoor light that does not require power from the local power generators. The solar powered street light does not require an overhead or underground electrical wiring, does economical. Furthermore, it will not necessitate any additional power from the grid line avoiding the use of electrical distribution equipment which are sometimes unreliable and unavailable.

Solar powered street lights will be relied upon to provide illumination every night. With the installation of a battery or a “power bank” as we now call it, properly designed solar lights will be illuminating the night for at least five nights even if there is inadequate sunlight during day time. There is no doubt that the solar

powered street light is a versatile form of a lighting system. It will illuminate roads, villages, barangays, school, and will help improve our day to day life.

It is very clear that the solar power street lighting system packs a number of advantages to the community. Productivity will surely increase because working days are lengthened. This piece of equipment will extend the number of hour on commercial activity thereby increasing the economic stability of a rural community. Students will be safe at night, and creates opportunities for further educational activities. A community that has an effective and reliable type of illumination decreases urban migration, because the community will have the same comfort of safety and security as in the urban areas. Crime is also bound to decrease because the community police can now see any criminal activity which may have been covered in darkness in the past.

The Solar powered lighting system is readily available, proven and economically viable. If only our nation can dedicate a portion of its budget to enhancing the technology. One issue commonly cited is the lack confidence in solar lighting as a reliable means of providing outdoor lighting. Though there have been stories of success and failure on solar projects in the Philippines, but with considerable vigilance and a good amount of focus, the solar powered lighting can be successfully introduced in all of the community.

**OBJECTIVES OF THE STUDY**

The primary concern of the study is to install a Solar Powered Street Lighting system in Sapang Patay, San Isidro II, Paombong, Bulacan.

**CONCEPTUAL MODEL OF THE STUDY**

**SPECIFIC OBJECTIVES**

- i. Determine the most efficient utility design for a solar powered street lighting system suitable for Sapang Patay St. San Isidro II, Paombong, Bulacan.
- ii. Develop a lamp post design that is uniquely made for the worst conditions of a fishpond area.
- iii. Assemble and fabricate a solar powered street light system and conduct experiments and modifications.
- iv. Conduct monitoring activities to test the efficiency of the system.

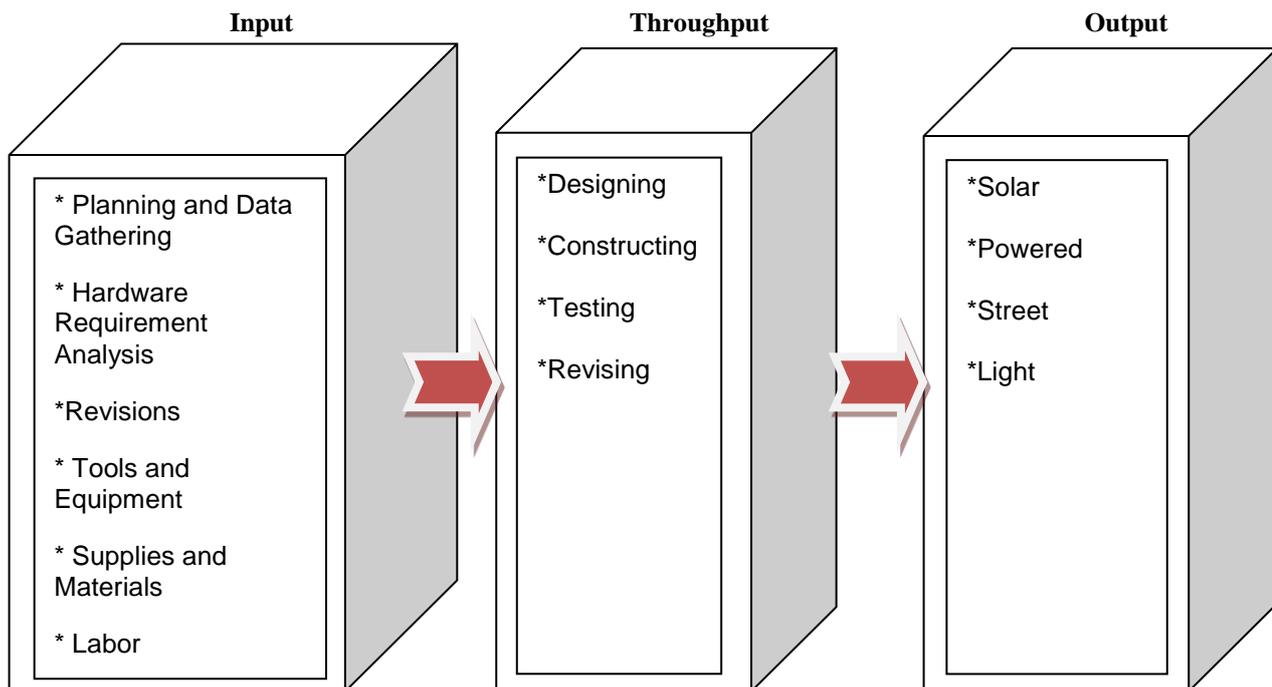
**SIGNIFICANCE OF THE STUDY**

This study shall benefit the residents of Sapang Patay St. in San Isidro II, Paombong, Bulacan. It has been foreseen that more residents shall feel free to walk at night due to the illumination provided by the project. It has been arranged through a Memorandum of Agreement with the Barangay Council of San Isidro that the officials shall exert extra effort to ensure the equipment will be protected from thieves and alike.

**SCOPE AND DELIMITATION**

The study will deal with the development of a solar powered street lighting system that will be used to illuminate Sapang Patay st., in San Isidro II, Paombong Bulacan. The system will be installed along the road leading to the center of the residential area. The study will also deal with the monitoring and data gathering activities that will determine the efficiency of the system.

Figure 1: Conceptual Model for the Solar Powered Street Light for Sapang Patay.



The model in figure 1 consists of three major components which include the input, the throughput and the output. The input consists of planning and data gathering, hardware requirement analysis, revisions, tools and equipment, supplies and materials and labor. The throughput includes the designing, constructing, testing and revising. The output of the study is Solar Powered Street Light for Sapang Patay.

**METHODOLOGY OF THE STUDY**

The descriptive and developmental method of research was used in this study. The descriptive method of research involves a gathering of information about the present existing conditions. This method, basically involves identifying and defining the problem, selecting appropriate sources of data, adopting appropriate techniques for data gathering, procedures, analyzing, describing and interpreting the data.

Developmental research, on the other hand, is a research method that can provide practitioners with important data. It is mainly focused on the design, development and evaluation of products and processes. This study could be described specifically as a project development because it is a creative development of a project based on a thorough determination of the present situation and the goals at hand.

**RESPONDENTS**

Purok Sapang Patay in the Municipality of Paombong Bulacan will serve as the project’s respondents. It is an area of mainly fishpond within its vicinity.

A 40% sample size shall be chosen using stratified random sampling procedure.

The sampling shall involve a 30 head of the family in the area together with the 10 barangay leaders. Table 1 will show the respondents together with its total population and sample size.

**Table 1:** Respondents of the study

Respondents	Population	Sample Size
Head of the Family	30	12
Barangay leaders	10	4
Total	40	16

**DATA INSTRUMENT**

The instrument used in the study was a survey-questionnaire. The questionnaire was divided into two parts. Part one is the profile of the respondents. The second part is the respondent’s perception regarding the functionality, durability, physical features, cost and safety of the solar powered street light.

The questionnaire uses the Likert- type scale of 1-5. Five (5) being excellent and one (1) is poor.

**DATA ANALYSIS**

The data gathered from the respondents were tabulated and analyzed to determine the functionality, durability, safety and physical features of the project.

The weighted mean for each criterion in the instrument was computed to determine the functionality, durability, physical features, cost and safety of the project. Table 2 shows the interpretation of the computed weighted mean for each indicator.

**Table 2:** Interpretation of the weighted mean

Scale	Verbal Description
4.21 – 5.0	Excellent
3.41 – 4.20	Very Good
2.61- 3.40	Good
1.81- 2.60	Fair
1.0 – 1.80	Poor

**RESULT AND DISCUSSIONS**

Table 3 shows the summary of the evaluation and the mean on each criterion on the functionality, durability, physical features, cost and safety of the solar powered street light.

**Table 3:** Summary of the ratings given by the respondents.

Criteria		Mean	Interpretation
Functionality	Easy to operate/ user-friendly	4.87	Excellent
	Low maintenance	4.7	Excellent
	Average	4.78	Excellent
Durability	Quality of Materials used	4.33	Excellent
	Rigidity of the construction	4.53	Excellent
	Average	4.43	Excellent
Physical Features	Workmanship	4.81	Excellent
	Appearance of the project	4.72	Excellent
	Average	4.76	Excellent
Cost	Material cost	4.57	Excellent
	Development cost	4.53	Excellent
	Average	4.55	Excellent
Safety	Low risk of electrical shock	4.52	Excellent
	Safety features are installed	4.45	Excellent
	Average	4.48	Excellent
Overall Mean		4.6	Excellent

The computation reveals that the different criteria got an average score of 4.78, 4.53, 4.76, 4.55, and 4.48 respectively. It has an overall mean of 4.6. These numbers implies that the respondents have an excellent perception of the solar powered street light.

## REFERENCES

- [1]. Calderon J.F. and Gonzales, E.C. (2008). *Methods of Research and Thesis Writing*. Manila, Philippines: NBS.
- [2]. G. Ayorkor Korsah, Ken Goldberg, *The African Robotics Network and the 10 Dollar Robot Design Challenge*. IEEE Robotics & Automation Magazine, Volume 20, Issue 1, March 2013.
- [3]. Chang, JinYi (1990). Teachers College Students' Conceptions about Evaporation, Condensation, and Boiling. *Science Education* ,83,511526
- [4]. Kesiduo and Duit, R. (1993). Students Conceptions of the Second Law of Thermodynamics An Interpretative Study. *Science Education*,43, 85105.
- [5]. Reif, F. (1986). Scientific approaches to science education. *Physics Today*. 39, 4854.