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THE PUBLIC AWARENESS LEVEL OF THE POTENTIAL OF DEVELOPING SOLAR ENERGY PROJECTS FOR SOLVING ENERGY ISSUES OF FLOOD AREAS IN KOTA BHARU, KELANTAN

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ABSTRACT

This research aims to assess public awareness of solar energy development in flood areas in Kota Bharu, Kelantan.. In cases like natural disaster, for instance flood disaster, solar energy is very significant during flooding in Kelantan 2014 it was created a devastating phenomenon for city dwellers. Energy consumption rises along with economic expansion since there is a proportionate relationship. Even though numerous methods for boosting energy production capacity have been suggested, many people in developing nations continue to live in places that lack electricity, especially during flood disaster that have issues on electricity supply .The research aims to measure public awareness levels towards solar energy development in flood areas. The primary data is a survey questionnaire with 200 respondents from flood areas in Kota Bharu, Kelantan, while secondary data is collected from various sources, including Google Scholar, research gate, research paper, book, official website, journal, and newspaper. The findings suggest that many respondents have a solid understanding of the solar system and are accepting of its use. The solar energy project is well-aware and widely accepted, particularly in aiding people in obtaining alternative energy during floods.

Keywords: *Solar energy, flood disaster in Kelantan, importance of solar*

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INTRODUCTION

The overall study for this research is concerned about the public awareness on solar energy development in solving energy issues for flood areas In Kota Bharu, Kelantan. Nowadays, energy demand and supply management has emerged as a global problem. Solar energy is being seriously considered for satisfying a significant part of energy demand in Malaysia, as is in the world (Majeed Muzathik et al., 2010). Natural disasters, like floods, earthquakes, and droughts, are unpredictable and uncontrollable. They threaten lives, property, agriculture, and ecosystems. Recent years have seen increased impact and frequency due to environmental deterioration, land use intensification, deforestation, and population growth (Mohammad, 2015).

LITERATURE REVIEW

Flood Events

Floods are a global natural disaster caused by weather, affecting metropolitan areas through direct and indirect repercussions. Direct effects involve harm from direct contact with floodwaters and commodities, causing physical deterioration (Muqtada et al, 2014). Floods, caused by flash, mud, and monsoon, cause significant hardship and loss in dry areas. This evaluation study assesses local adaptation to the monsoon flood disaster in Kota Bharu, Kelantan (Ang K. H. 2014).

Flood disasters have immediate and long-lasting negative consequences, including loss of life, damage to infrastructure, sewage system failure, and shortages of essential supplies. These direct impacts are less than the costs to society (Flood site 2015). There are many different forms of fast and slow floods, but only three flood disasters occur in Malaysia which is flash floods, mud floods, and monsoon floods. Flash floods are situations that occur unexpectedly as a result of persistent, heavy rain (National Weather Service, 2015).

In cases like natural disaster, for instance flood disaster, solar energy is very significant during flooding in Kelantan 2014 it was created a devastating phenomenon for city dwellers. On the east coast of Peninsular Malaysia, the state of Kelantan regularly experiences floods of various severity. They also have an impact on Terengganu and Pahang, two of its nearby states. Previous floods, including those in 1927 and 1967, were important in the history of Kelantan (Baharuddin, et al., 2015). The 1967 flood had a significant effect on the people of Kelantan; it is believed that 70% of the village in the state, or over half of its inhabitants, were impacted (Chan NW, 1995).

The 2014 flood was the most significant and largest recorded flood in the history of Kelantan. It was considered to be a “tsunami-like disaster” in which 202,000 victims were displaced. The goal of this study is to examine and analyse the flood effect that occurred in Kelantan during the course of the previous ten years (2001–2010) (Aminah Syakirah, 2016).



Figure 1: Flood event in Kelantan 2014



Figure 2: Flood in Kelantan

Solar Energy

Solar energy, produced by the sun's fusion reactor, is a renewable source that can supply the world's energy needs for a year. It is sent to Earth through solar collectors, which can convert it into useful energy. Assuming this renewable source can produce 650 barrels of oil's worth of power annually (Mohammad Bagher, 2015). Solar energy is the future's best choice due to its abundant, sun-emitting, and abundant renewable energy sources (Panwar N, Kaushik S, Kothari S. 2011).

The planet receives solar energy in a variety of ways, including heat and light. Most of this energy's part is lost throughout its journey due to clouds' scattering, reflection, and absorption. According to studies, solar energy can properly meet the world's energy needs because it is abundant in nature and a cost-free source of energy (Lewis NS.,2007).

A typical industrial energy system consists of power supply, production facility, energy recovery, and cooling systems. Power supply supplies energy for electrical, heat, gas, steam, or coal-based systems, while manufacturing plant operates valves, switches, solenoids, and subsystems. Solar energy systems can be used for both processes and power supply (S. Mekhilef R. Saidur A. Safari, 2011). There are 2 basic types of solar energy, according to numerous studies. Photovoltaic solar energy is the first kind and focuses on converting light into power (Mohammad Bagher, 2015). Solar thermal energy is the second kind of solar energy, according to the Global Energy

Network Institute (2014). The main goal of solar thermal energy is to directly use or transform the heat from the sun into mechanical energy (Silva & Andrade, 2021).

The photovoltaic effect was first identified in the 1830s, and the first solar PV panel was constructed in 1954 by Bell Laboratories in the US. Photovoltaic panels convert direct sunlight into alternating current, making them a widely used form of solar energy (TRVST, 2020). A solar cell system converts sunlight into electrical energy, with major nations like China, the US, and the EU building large solar farms. As populations grow, developing nations seek solar radiation energy (TRVST, 2020).

Concentrated solar power (CSP) is a type of energy that concentrates sunlight using mirrors and lenses. It originated in Archimedes' glass and was first developed by Alessandro Battaglia in 1886 and Dr. R.H. Goddard in 1929. The first solar steam engine was powered in 1866 (TRVST, 2020). Since Fresnel lenses have a high optical efficiency, are light, and are inexpensive, they are utilized as solar concentrators (Leutz R, Suzuki A, etc., 2000).

METHODOLOGY

Methods that will be used to prepare this research in order to accomplish the goals and objectives are described in Chapter 3. The aim for this research is to initiate the outcome of issues on the implementation of PFI towards the quality of construction product. Moreover, this chapter will also focus on the research objectives such as; measuring the level of awareness of people towards solar energy development in solving energy issues for flood areas in Kota Bharu, Kelantan.

Overview Of Research Methodology

Research methodology is crucial for achieving study objectives and connecting existing knowledge. Academics must prioritize accuracy in this endeavor, as the field of business research is fragmented and interdisciplinary, making it difficult to create accurate and relevant research (Hannah, 2019). Staying up-to-date with cutting-edge research is challenging, making literature reviews a useful research technique for compiling and synthesizing prior research in various fields (Baumeister, (1997). Reviews of the available literature serve as an essential starting point for all kinds of study. They can give evidence of an effect, set standards for policy and practice, serve as a foundation for knowledge development, and, if done correctly, have the potential to spark new ideas and directions for a particular field

Research Scope

This study's target respondents would be 200 people from each district in Kota Bharu, Kelantan in order to assess the current flood difficulties in this region. Due to the limitation of online questionnaire distribution, a sample size of 200 respondents have been delivered face-to face for this study. They were chosen as respondents because they were among those who experienced or were impacted by the energy problem during the flood monsoon.

Research Process

In conjunction with a literature study for direction, this method will serve as the primary data source. The responders will receive a set of questions to gather their comments, ideas, and suggestions. The questionnaire is designed for this study in such a way as to discover recurrent problems that arise during the flood monsoon and their preparation to ensure they won't lose the energy supply. There are several sections of the questionnaire, including both open-ended and closed-ended questions. Depending on the study's aims, goals, and scope, several types of data are collected. Due to the categorization of data into primary and secondary data, the two techniques of data collecting utilized in this study, a literature review, and a questionnaire survey. Each take a distinct approach and will lead to different outcomes. Furthermore, as it is a part of the research technique, the obtained data will be analyzed subsequently. Software called SPSS Version 28.0 will be used to analyze the data in this study.

DATA COLLECTION AND DATA ANALYSIS

This study conducts a literature review using primary sources from books, journal articles, and official websites, including Google Scholar, Scopus, and Science Direct, to analyze earlier research results. The questionnaire also will be used to collect the data from the case study.

Primary Data

Quantitative data analysis was used to assess the resident case study. This study observed in every district in Kota Bharu, Kelantan.

Secondary Data

The researcher collected secondary data when the primary data was unavailable. Secondary data sources include databases, journals, and internet publications.

Researchers use secondary data. Books, journals, and articles from previous studies. Perpustakaan Tunku Abdul Razak and the internet provide secondary data. Every journal, book, and excerpt are used in the literature review.

DISCUSSION

The researcher prepares a questionnaire to collect the data from the respondent in the case study. The focus aspect for the researcher is to measure the awareness of the people in Kota Bharu Kelantan about solar energy and their acceptance of solar energy. The respondent needs to rate from the least important (1) to the most important (5).

Table 1: How Much Do You Know About The Solar Energy

	Frequency	Percent	Valid percent	Cumulative percent
1	0	0%	0%	0%
2	43	21.5%	21.5%	21.5%
3	41	20.5%	20.5%	42%
4	113	56.5%	56.5%	98.5%
5	3	1.5%	1.5%	100%
Total	200	100%	100%	

The highest rate from the respondent is 4 with the value of the respondent is 133 respondents. Next is 43 respondents have chosen 2 for their knowledge about the solar energy. After that 41 respondent have choose 3. 3 respondents have chosen 5 for their knowledge about the solar system. The last one is no respondent choose for the value 1.

Table 2: Do You Aware On The Significant Of Solar Energy In Helping People To Provide Backup Power During Flood Disaster?

	Frequency	Percent	Valid percent	Cumulative percent
1	0	0%	0%	0%
2	20	10%	10%	10%
3	117	58.5%	58.5%	68.5%
4	47	23.5%	23.5%	92%
5	16	8%	8%	100%
Total	200	100%	100%	

The highest one the value three (3) where 117 respondents have chosen 3 for their awareness. Then 47 respondents have chosen 4. 20 respondents have chosen 2. Lastly 16 respondents have chosen 5. While no respondent chooses for the value 1.

Table 3: Do You Aware On The Significant Of Solar Energy In Avoiding Power Blackout Issues During Flood Disaster?

	Frequency	Percent	Valid percent	Cumulative percent
1	0	0%	0%	0%
2	38	19%	19%	19%
3	61	30.5%	30.5%	49.5%
4	101	50.5%	50.5%	100%
5	0	0%	0%	
Total	200	100%	100%	

The highest is 101 respondents have chosen 4 for their awareness. Then 61 respondents have chosen 3. Next is 38 respondents have chosen 2. While no respondent chooses 1 and 5.

Table 4: Do You Aware On The Significant Of Solar Energy In Securing Telecommunication System During Flood Disaster?

	Frequency	Percent	Valid percent	Cumulative percent
1	0	0%	0%	0%
2	34	17%	17%	17%
3	63	31.5%	31.5%	48.5%
4	103	51.5%	51.5%	100%
5	0	0%	0%	
Total	200	100%	100%	

The highest is 103 respondents have chosen 4, 63 respondents choose 3, and 34 respondents choose 2. While no respondent chooses for 1 and 5.

Table 5: Do You Aware About The Significant Of Solar Energy Project In Reducing Dependency On Centralized Energy Resources From The Government (Tenaga Nasional Berhad).

	Frequency	Percent	Valid percent	Cumulative percent
1	43	21.5%	21.5%	21.5%
2	19	9.5%	9.5%	31%
3	65	32.5%	32.5%	63.5%
4	73	36.5%	36.5%	100%
5	0	0%	0%	
Total	200	100%	100%	

The highest value that have been chosen by the respondent is 4 with the total respondent who have choose for this value is 73. Next is 65 respondents choose for 3. Then 43 respondents choose for 1. After that, 19 respondents choose for 2 and lastly no respondent choose for 5.

Table 6: How Much Do You Aware About The Significant Of Solar Energy Projects In Creating A Micro Power Supply During Emergency Situations, Like Flood Disaster?

	Frequency	Percent	Valid percent	Cumulative percent
1	13	6.5%	6.5%	6.5%
2	57	28.5%	28.5%	35%
3	59	29.5%	29.5%	64.5%
4	71	35.5%	35.5%	100%
5	0	0%	0%	
Total	200	100%	100%	

Based on the graph, for the question how much the respondent know about the solar energy can create the micro power supply during emergencies is 71 or same with 35.5% of the respondent choose 4. Next, 59 respondents choose 3 same with 29.5%. Then, 57 respondents choose 2 with the percentage is 28.5%. The lowest is 13 respondents choose for 1 with the percentage 6.65%.

RECOMMENDATIONS

From the findings shown in Table above, it is clearly indicated the level of public awareness on the significant of solar energy projects in helping the victim of flood disaster area in Kota Bharu, Kelantan. All data from Chapter 4 shows that there are potential in implementing the solar energy project for Kelantan, which is feasible for the future of government's action plan in mitigating issues during any flood disaster. It can be concluded that, the awareness level is good and there are huge acceptance from the people for this solar energy project, especially in helping the people to gain alternative energy during flood occurrence. However, the local government needs to be proactive in educating and increasing the knowledge level to all people in Kelantan through special program or campaigns. It is hope that, with the engagement from all stakeholders in Kelantan, it will solve the issue of power supply disruption during flood disaster for the future of this state.

CONCLUSION

In conclusion, the form that have been distributing was successful in distributing the questionnaire to the general public in Kota Bharu, Kelantan. This study directly engaged 200 individuals in total. To accomplish the study's objectives, including determining the level of people's awareness in Kelantan about solar system energy, this questionnaire has been separated into a number of sections. Overall, it indicates that many respondents have a solid understanding of the level of their knowledge about the solar system and their acceptance towards the solar energy system.

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