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INSTALLATION OF SOLAR-POWERED LIGHTING IN CIRUMPUT VILLAGE, CUGENANG DISTRICT, CIANJUR REGENCY

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Abstract

the earthquake that occurred in Cianjur West Java on november 21 resulting in 327 deaths. One of the problems in Kampung Nagrog after the earthquake was lighting. Some places do not have lighting such as toilets, prayer rooms and roads. Lighting is needed because the mobility of residents and volunteers is very high after the earthquake both during the day and at night. Therefore we need a lighting source that stays on if there is a disturbance in the PLN electricity network, is environmentally friendly, and economical. The solution to the problems of Kampung Nagrog after the earthquake disaster is to install solar cell lights. Solar cell lights do not need a PLN electricity network, are environmentally friendly and economical. Solar cell lights are moveable or can be moved easily.

Keywords: Community assistance, Natural disasters, Solar lights.

INTRODUCTION

An earthquake with a magnitude of 5.6 occurred at a depth of 10 kilometers on Monday, 21 November 2022 at 13:21:10 WIB with the epicenter around Sukabumi, Cianjur, West Java resulting in 327 deaths and 327 people being seriously injured. Apart from causing casualties, the Cianjur earthquake also caused considerable economic losses. Post-disaster recovery is carried out in all aspects, so that post-disaster life can quickly run normally. Various efforts were made by many parties to work hand in hand to help, work together to carry out an emergency response to be able to reduce further victims and speed up recovery from the earthquake both physically and psychologically (trauma healing). Figure 1 shows the condition of Cigrass Village after the earthquake.

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Figure 1. The current condition of the Cianjur Earthquake in the village of Nagrak, Cugenang District, Cianjur Regency

Solar voltage lighting is more energy efficient than diesel engines. Diesel energy is very wasteful for general lighting and runs out of gas because the location is far from filling. Candles and torches are very dangerous for evacuees due to the exposure of personal belongings that do not have safety boxes which are feared to cause a fire that spreads quickly [1]. A very large solar radiation can be utilized to become electrical energy. The solar cell is one of the photovoltaic light sensors, which are sensors that can change light intensity into changes in output voltage[2].

In clear weather conditions, the earth's surface receives about 1000 watts of solar energy per square meter. Less than 30% of this energy is reflected back into space, 47% is converted into heat, 23% is used for the entire working circulation above the earth's surface, a small portion of 0.25% is accommodated by wind, waves and currents and there is still a very small part. 0.025% is stored through the process of photosynthesis in plants [3]. As the mobility of the earthquake-affected areas increases for the recovery process, many activities require additional lighting. Lighting lamps which are for the common good, their needs increase when people's mobility increases [4].

The purpose of this service is to provide assistance to the people of Cigrass Village who were affected by the Cianjur earthquake in the form of installing solar lights at several village strategic points.

IMPLEMENTATION METHOD

One of the problems faced by the community in several villages in the Cianjur Regency area after the earthquake was lighting. Some places do not have lighting such as toilets, prayer rooms and roads. Lighting is needed because the mobility of residents and volunteers is very high after the earthquake both during the day and at night. Therefore we need a lighting source that stays on if there is a disturbance in the PLN electricity network, is environmentally friendly, and economical. The solution to this problem is to install solar cell lights. Solar cell lights do not need a PLN electricity network, are environmentally friendly and economical. Solar cell lights are moveable or can be moved easily. Solutions, outcomes, and problem indicators in Kampung Nagrog after the earthquake can be seen in Figure 2.

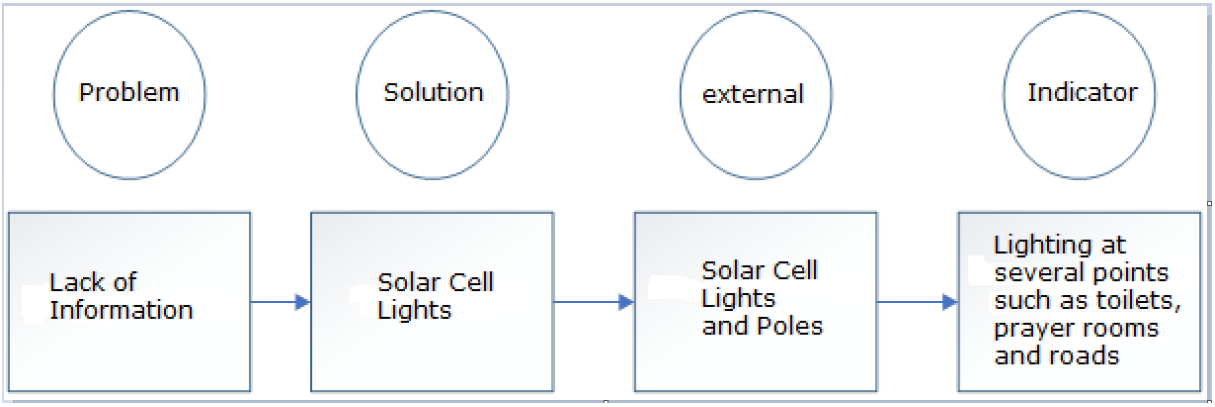

Figure 2. Schematic diagrams of problems, solutions, outputs, and indicators

The expected output of the chosen solution is to install solar powered lights to illuminate strategic points and roads. Strategic points include toilets, prayer rooms, public kitchens, places for volunteers and others. Mobility and activities of residents and volunteers at night are easier with solar powered lights. The indicators of this program are the comfort of residents and volunteers when doing activities at night such as worship, traveling at night, defecating and others. Figure 4 is a design of solar-powered lamps that will be installed at 20 points in several sub-districts in the Cianjur Regency area. The lamp to be installed is 400 W and the pole has a height of 500 cm and 50 cm for the foundation. There are 20 installation points spread across several villages in the Cianjur Regency area (Table 1). The solar-powered lamps are purchased in Jakarta while the manufacture and assembly is carried out in Cigrass Village. The community participated in helping to install lights in each village.

Table 1. Solar cell distribution point

District name	Village name	Village name	Number of solar cell
Cugenang	Cirumput	Nagrog	3
		Cirumput	3
		Tugu	3
		Babakan	3
		Barulega	3
Cilaku	Sirnagalih	Bonceret	1
Sindangbarang	Mekarlaksana	Cihampelas	4

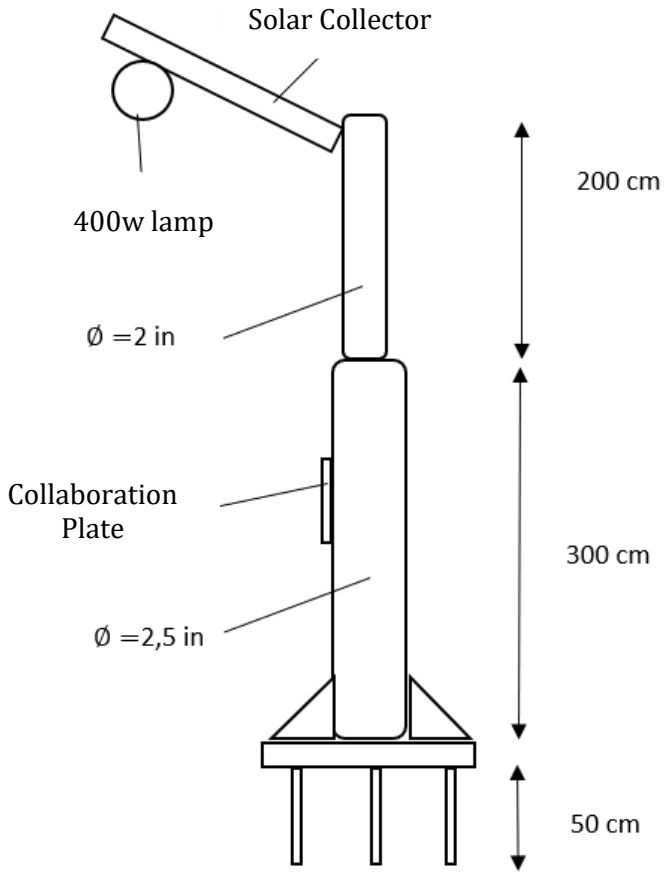

Figure 3. Solar cell lamp along with the pole

The partners involved were the Head of Cigrass Village, Mr. Beni Irawan, SH, who is also the Chair of the Association of Village Heads in the Cianjur Regency Area (APDESI), Karang Taruna, Cianjur Regency, which was chaired by Mr. Mudrik. Forms of partner participation include::

1. Directing the team of field assistants in determining the location of the installation of solar cell lights.
2. Mobilizing the community in assembling and installing solar cell lights at predetermined points.

RESULTS AND DISCUSSION

Community service activities Bangkit Village (KKB) activities include several stages of activity, including; survey and analysis of community needs, socialization of the solar-powered lighting installation development program, implementation including, pole assembly, and installation of solar cells in Cigrass Village.

Surveys are carried out to ensure that the programs to be implemented are in accordance with the needs of the community. The survey was conducted on Sunday 11 December 2022 which was attended by the chief proposer and one of the proposing members along with four students. In addition to ensuring compatibility between the proposed program plans and the needs of the community, the initial visit to the earthquake site also took time to coordinate with the head of Cigrass Village, Mr. Beni Irawan, S.H. At the meeting, the team presented the

program plan for installing fifteen powered lighting lamps in Cigrass Village to the Village Chief and the Head of People's Welfare Section. The village head gave directions on the installation points as needed. Fifteen solar powered lighting lamps will be installed in five villages, namely Kp. Monument, Kp. Cigrass, Kp. Barulega, kp. Babakan and Kp. Nagrog each village gets 3 solar powered lights which will be installed at predetermined points. In Figure 4 shows a photo of the visit and coordination with the Head of Cigrass Village. During this coordination, a socialization plan was also conveyed to village apparatus, community leaders, heads of neighborhood associations and heads of youth organizations in Cianjur regency.

Figure 4. Visits and Coordination with the Head of Cigrass Village.

The socialization stage for the solar-powered lamp installation program will be held on Tuesday, 13 December 2022 at 14.00 s.d. done. The socialization was attended by Village Officials, Community Leaders, Heads of RTs and Heads of Karang Taruna, Cianjur Regency. The meeting was opened by delivering remarks by the Chief Researcher and remarks from the Head of Cigrass Village as well as conveying directions regarding the program to be implemented. Figure 5 shows the program socialization activities.

Figure 5. Socialization of Solar Lighting Installation Program

The Implementation Phase includes the procurement of solar cells and the procurement of poles. Procurement of 2 in 1 type solar cell lamps with a capacity of 400 watts SMD Automatic equipped with 20 units of remote. The pole to be used for installing public street lighting (PJU) is made of 2.5 inches of iron with a height of 500 cm above the ground and planted 50 cm high. Procurement of the poles was carried out in cooperation with the Surya Abadi Las welding workshop, which is located near the Cianjur area, Cigrass Village, Cugenang District. Figure 6 below shows the pole manufacturing process.

Figure 6. Pole manufacturing process

The pole assembly was carried out in collaboration with the Surya Abadi Las welding workshop, which is located near the Cianjur area, Cigrass Village, Cugenang District. Apart from being carried out by the workshop, the pole assembly process is assisted by three students from the Mechanical Engineering study program. At this stage, solar cell PJU lamps are attached to the ends of the poles. Figure 7 below shows the process of installing solar cell lights.

Figure 7. The process of installing solar cell light

After the assembly process is complete, the PJU poles and solar cell lights are ready to be installed. The installation process was carried out in mutual cooperation involving students and local residents. PJU solar cell lights are placed in dark spots, there is no lighting at all where there are public facilities in accordance with the directions of the Village Head and coordinated

by the Head of People's Welfare Section. Figure 7 below documents the process of mobilizing tools and materials to the installation point and the installation process.

Figure 7. The process of mobilizing and installing solar cell PJU lights

The final stage is testing the solar cells that have been installed. Figure 8 shows an image of a solar cell that is lit at night. Solar cell lamps have illuminated strategic points in Cigrass Village such as roads, toilets, schools and relocation tents

Figure 8 shows the PJU Solar Cell lights that have been installed and illuminate the surrounding area.

CONCLUSION

Community service activities are carried out in three districts, namely in Cugenang District, Cilaku District and Sindangbarang District. Community service activities which are the implementation of the Kampung Cekattan Program initiated by KEMENDIKBUDRISTEK DIKTI are focused on providing solutions to overcome the problems faced by residents and providing benefits, among others.

1. Increasing people's mobility at night
2. Adequate information can provide a sense of security and comfort to the public.
3. Reducing the burden of paying for public electricity

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