

Water Filter Operating on Solar System

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Abstract: *In this paper, we highlight the effects of contaminated water on humans as well as the crisis of water supply and distribution of potable water in many areas of developing countries. While water is the most important substance on earth and a primary human need, contaminated water can cause and spread diseases. It is, therefore, necessary to ensure that water is purified and decontaminated for daily use at a low cost. The design of solar-powered water purification systems is thus regarded as an important means of producing clean water. Solar energy poses no polluting effect and has become a dependable energy source for usage. The design of a solar-powered water purification system is based totally on the thermal method by using the thermal heating system principle which converts sunlight rays into heat. The most vital aspect is the absorption of heat to induce evaporation of water. Research shows that flat plate collectors produce heat at relatively low temperatures (27°C to 60°C) and are commonly used to heat liquids. A solar-powered water purification system consists of a solar collector that absorbs sunlight to ensure vaporisation, which is the first stage of purifying and a filter that removes contaminants. Four different concepts have been developed. A detailed description of the components and the operation of the systems constitute the main contribution of this paper.*

Keywords: Water filter

I. INTRODUCTION

The earth's climate has changed throughout history. Over the years there have been seven cycles of glacial advance and retreat, with the abrupt end of the last ice age about from years ago marking the beginning of the modern climate era and of human civilization. Average temperatures around the world have risen by 0.75 degree Celsius over the last century and about two thirds of this increase have occurred since 1975, this phenomenon was the so-called global warming. Global warming is damaging the earth's climate as well as the physical environment. One of the most visible effects of global warming can be seen in the arctic as glaciers, sea ice is melting rapidly and unseasonal weather conditions. Here in Philippines, the unseasonal weather changes were experience. Devastating storms and extreme environmental heat can happen in no exact time and scenario. There are several remote areas in the Philippines that in need of safe drinking water. In Laguna within the first-class city of Calamba, there's a remote area called Sitio Runggot part of Brgy. Lecheria in Calamba City. The sitio is approximately 6 hectares with a vast agricultural land area, small community, and an open field area adjacent to Laguna Lake.

One of the major caused of floods in the area was the location of its land which is proximate to Laguna Lake. The residents of Sitio Runggot suffered from flood settlement in a period of time due to lake water splashing out during rainy season. One of the possible solutions for the potable water shortage was water purification. In today's market, there are several water purifier systems that purifies water according to type and volume of water being purified. This water purifier includes reverse osmosis machinerics and other manufactured industrial and household water purifiers.

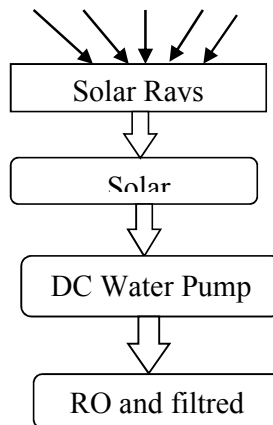
India Solar water purification involves purifying water for drinking and household purposes through the usage of solar energy in many different ways. Using solar energy for water treatment has become more common as it is a usually low-technology solution that works to capture the heat and energy from the sun to make water cleaner and healthier for human use and consumption. Solar water treatment is particularly beneficial for rural communities, as they do not have other forms of water purification infrastructure and more importantly, electricity to run such structures. The most positive feature about solar water purification is that there is no requirement of fuel. It's precisely due to the lack of fuel that makes solar applications relatively superior than conventional sources of energy as it does not cause pollution (global warming, acid rain, ozone depletion) or health hazards associated with pollution. There are four main types of solar water treatment: solar water disinfection (SODIS), solar distillation, solar water

pasteurization, and solar water treatment systems. Some of these technologies have been around for a very long time, but most are new adaptations to the concept of solar energy. These technologies are quite simple and easy to understand, usually require low financial input, and are proven effective.

Pure drinking water is essential to ensure good health. Contaminated water hampers health by causing several water borne diseases such as Diarrhea, Cholera, Guinea worm disease, Typhoid and Dysentery. In developing countries like Bangladesh, scarcity of pure drinking water is a big issue till now. Diarrheal disease is the country's biggest killer, taking the lives of 62 in 1000 under fives [1]. Besides, dependency on limited energy resources indicate future problem for these countries. During flood and other calamities, intensive public service campaigns alert people to boil their drinking water, but fuel is limited and costly [1]. Leaning towards renewable energy might solve the energy crisis. A water resource should be safe and reliable but also affordable to people. In order to provide a safe and affordable water supply, solar water purifier is a potential solution.

Other water purification systems are inefficient. Existing water purification systems using solar power are very time consuming and complex in design. The Krystall, by SwissINSO Holdings, Inc., is able to produce up to 98,421 liters (26,000 gallons) of purified water per day, the system is bulky, immobile, and it comes at a price tag of \$1,200,000. H2All Mobile, by Trident Device system can purify up to 567 liters (150 gallons) per day for \$9,000. At \$25,000, the E3 Direct Solar Distillation System is able to produce 379 liters (100 gallons) of clean water per day using only solar power. These all are very expensive. So, finding an economic solution which is affordable to people is compulsory. In this paper, economic design and construction of solar water purifier is presented.

Working principle



A solar panel is a device that collects and converts solar energy into electricity or heat. It known as Photovoltaic panels, used to generate electricity directly from sunlight.

Solar panel consists of number of silicon cells, when sun light falls on this panel it generate the voltage signals then these voltage signals are given to charging circuit. Depending on the panel board size the generated voltage amount is increased. In charging circuit the voltage signal from the board is gathered together and stored in the battery.

As shown in the figure the basic layout of our project the main thing is that to all the system gets work by using solar panel and the lead acid battery. As shown in figure when the solar rays falling on the solar plate then the dc current generated in the system and this is then stored into the lead acid battery.

The water sump is fullfill with water so that when we press the motorbutton ON then The 12v water pump run by the battery in which the dc current stored in battery and water pump lift up the water from water of sump and flows the water through mermen and water gets filtered.

1.1 Need of System

Solar water distillation uses a solar still to condense pure water vapour and settle out harmful substances to make clean, pure drinking water. This process is used when the water is brackish containing harmful bacteria, or for settling out heavy metals and also for desalination of sea water.



Water purification system



Solar plate

II. LITERATURE REVIEW

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III. MERITS AND APPLICATI

3.1 Merits

- It is real time operating system.
- The system is non-programmable.
- Light in weight, and easy operating.
- Purchase and operating is very less.



- Can be operated by unskilled person.
- It does not require high maintenance cost.

3.2 Applications

- It can be used in Houses, Industries