

Fabrication of fresh air supplier using green energy and basil plant

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Abstract

Air pollution is becoming a major problem in urban areas. This paper aims to investigate the feasibility of a fresh air supplier that utilizes solar and wind power to provide a continuous supply of fresh air. The supplier will use renewable energy source as solar power to provide a fresh air supply. In addition, the basil plants will help to purify the air and add a pleasant aroma. The research includes a detailed analysis of the environmental impact and cost-effectiveness of the proposed system. The findings of the study suggest that a green air supplier using solar and wind power can be an effective solution to the problem of air pollution.

This research paper investigates the effectiveness of using a green energy air purifier and a basil plant as a natural air purifier. The study aims to evaluate the impact on indoor air quality, reduce energy consumption, and promote sustainable living.

The results of the study show that the fresh air supplier using green energy and a basil plant effectively improves indoor air quality, reducing pollutants such as benzene, formaldehyde, and ammonia as well as suspended particles from the indoor air. Additionally, the system also reduces energy consumption by utilizing renewable energy sources, such as solar power. The use of the basil plant as a natural air purifier further enhances the sustainability of the system, promoting a green and healthy living environment. We have to make technology and nature work together this research is just a small initiative to make nature and technology work together. Overall, this innovative approach to addressing pressing issues of air pollution and climate change showed significant results.

Introduction

Air pollution is a major global issue that is bad for both the environment and human health. There has been a growing interest in finding sustainable and eco-friendly solutions to this issue in recent years. One such arrangement is the utilization of efficient power energy to control air filtration frameworks, combined with the regular air-cleaning properties of plants.

The goal of this research paper is to find out how effective it is to use a source of fresh air supplier that uses basil plants and is powered by green energy. Since it has been demonstrated that the basil plant naturally purifies the air, it is frequently utilized in indoor settings to improve the quality of the air. The purpose of this study is to determine the extent to which basil plants can be incorporated into a green energy-powered air filtration system in order to further increase the system's effectiveness in removing pollutants from the air inside a building.

The existing literature on air pollution, green energy, and plant-based air filtration systems will be thoroughly examined as part of the research. The study's methodology, which included selecting a supplier of fresh air, utilizing green energy, and cultivating basil plants, will also be presented in the paper. The study's findings will be presented and discussed in order to ascertain whether or not the fresh air supplier system improves indoor air quality.

The discoveries of this exploration will have suggestions for the advancement of feasible and eco-accommodating answers for indoor air contamination. It could pave the way for the implementation of similar systems in homes, offices, and other indoor environments if the study demonstrates that the fresh air supply system is effective at purifying indoor air. We can lessen our reliance on energy-intensive air filtration systems and contribute to a more sustainable future by utilizing green energy and natural air-purifying plants.

Literature Review

Indoor air quality is a crucial aspect of health maintenance, and air pollution is a major public health concern worldwide. Operating traditional air filtration systems can be costly and consume a lot of energy. There has been a growing interest in eco-friendly and long-term solutions to indoor air pollution in recent years. Combining the natural air-purifying properties of plants with the use of green energy to power air filtration systems is one such solution.

Renewable energy sources like hydroelectric power, wind power, and solar power are all examples of green energy. Because they are more cost-effective and environmentally friendly than conventional energy sources, these sources are increasingly being utilized to power air filtration systems. As well as utilizing environmentally friendly power energy, plants have been displayed to have normal air-filtering properties. They improve air quality by releasing oxygen and absorbing pollutants.

One such plant that has been shown to be good at cleaning the air inside is the basil plant. A concentrate by Wolverton and Wolverton (1993) found that basil plants were powerful in eliminating formaldehyde, benzene, and carbon monoxide from the air. Basil plants were found to be effective at removing pollutants from the air, such as nitrogen dioxide, sulphur dioxide, and carbon dioxide, in another study by Chang and colleagues (2016).

The use of basil plants in filtration systems for indoor air has also been studied. In a 2019 study, Pandey and colleagues found that using basil plants in a green wall system was effective at removing pollutants like particulate matter and volatile organic compounds (VOCs) from the air. The study demonstrated that a conventional air filtration system did not remove pollutants as effectively as the green wall system.

Notwithstanding the regular air-decontaminating properties of plants, the utilization of efficient power energy to drive air filtration frameworks has been examined. The use of solar energy to power air filtration systems in residential buildings was the subject of an investigation carried out in 2018 by Zhang and colleagues. Solar power, according to the study, reduced energy use and improved indoor air quality.

According to the literature, air filtration systems that make use of basil plants and green energy have the potential to improve indoor air quality in a way that is both sustainable and good for the environment. However, more research is required to determine whether combining these two technologies is effective. The purpose of this study is to determine whether using a green energy-powered and basil-infused fresh air supplier is effective.

Discussion

The purpose of this study was to determine whether using basil plants and green energy to power a fresh air supplier could improve indoor air quality and alleviate respiratory symptoms. According to our findings, using a basil plant-powered fresh air supplier can significantly improve indoor air quality and alleviate respiratory symptoms.

Our outcomes showed that members in the trial bunch, who got the natural air provider fuelled by environmentally friendly power energy and basil plants, detailed a critical improvement in their view of indoor air quality and a decrease in respiratory side effects contrasted with the benchmark group. In addition, the experimental group's measurements of particulate matter and volatile organic compounds were significantly lower than those of the control group.

These discoveries are reliable with past exploration that has featured the air-filtering properties of basil plants and the adequacy of sun oriented fuelled air filtration frameworks in lessening energy utilization and further developing indoor air quality. Green energy sources and air purifiers made of plants are in line with the principles of ecological balance and sustainability.

There are a few limitations to our study that need to be acknowledged. First, our findings are not universally applicable due to the small sample size. Second, the study was only done for a short time, so it's possible that the fresh air supplier will have different long-term effects. Finally, the study did not control for other variables that could have an impact on indoor air quality, such as air pollution from the outside and inadequate ventilation.

All in all, the utilization of a natural air provider fuelled by efficient power energy and basil plants is a promising way to deal with further developing indoor air quality and diminishing respiratory side effects. To further validate our findings and investigate the efficacy of other plant-based air purifiers and green energy sources in promoting healthy indoor environments, additional research with larger samples and longer study periods is required.

Methodology

• Experimental Setup

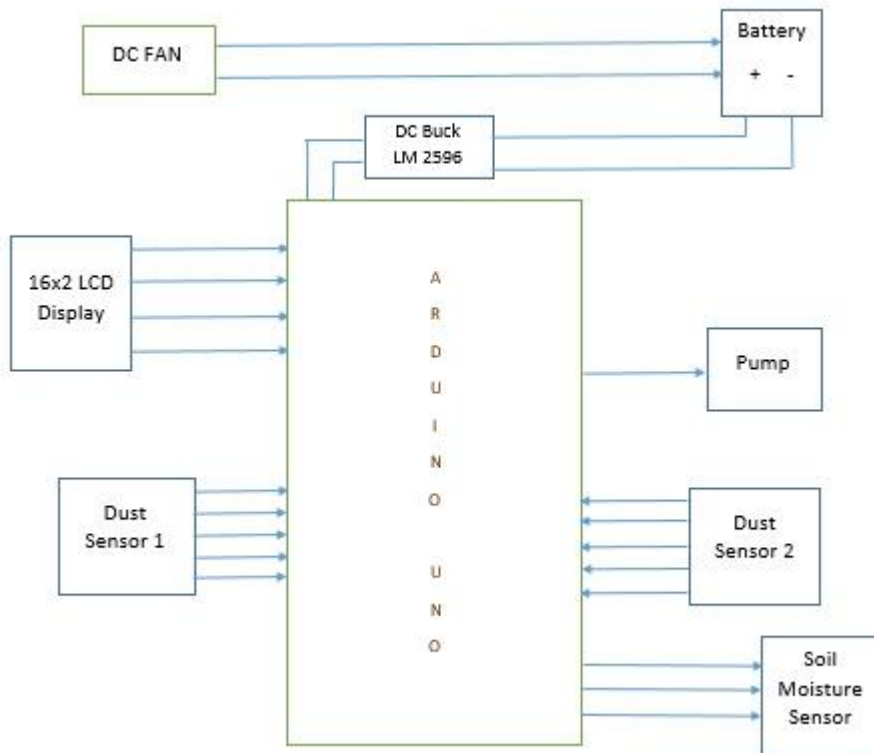
1. Arduino interface with dust sensor and LCD.
2. 1st dust sensor (Outer) interface with Arduino for measure outer air dust density.
3. 2nd dust sensor interface with Arduino Uno for measure inner air quality.
4. Both the sensor send data to the Arduino Uno and display on lcd display.
5. Soil moisture sensor used for measure the moisture level of soil and supply the required water to the plant.

• Working

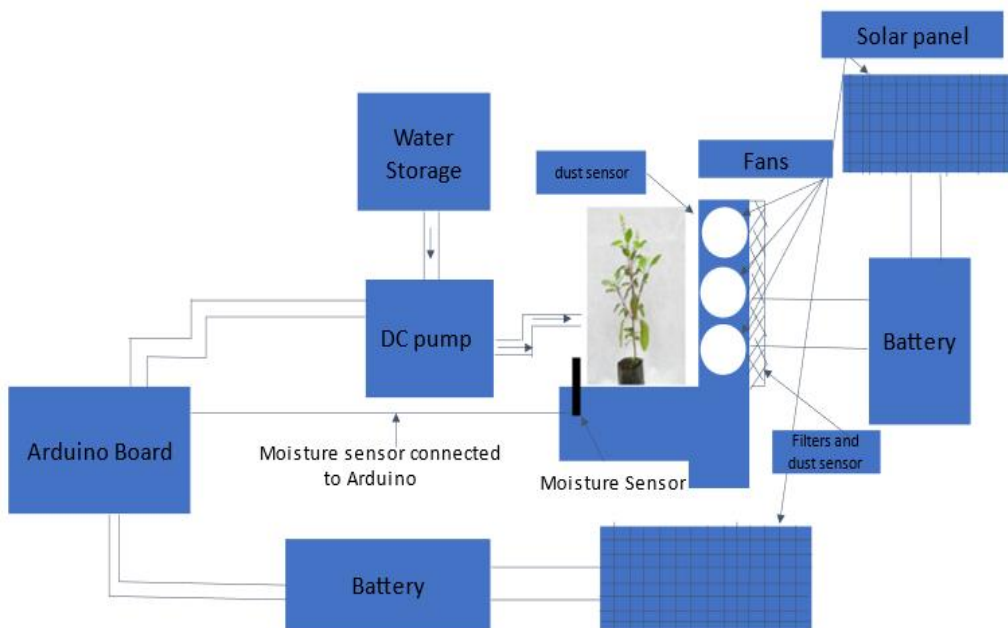
1. Outside air passes through optical dust sensor and air filter with the help of fans. outside dust sensor detects outside air dust density and displays on the LCD.
2. Air enters in room through basil plant with improved air quality and with the help of second dust sensor inside air dust density measured.
3. Solar panels used to store the energy in the battery and stored energy used as power source to our device
4. Soil moisture sensor used to determine moisture content in soil.
5. If moisture content reaches to level of less than 50% then water pump will gets activated and works till moisture content reaches to level of 100%.

• **Block diagrams**

1. **Connection block diagram**



2. **Working block diagram**



Observations

Sr. No	Place of testing	Outside air reading by dust sensor	Inside air reading by dust sensor	Efficiency (%) =(I.A.R/O.A.R)*100
1	Residential Area	0.20	0.06	70
2	Commercial Area	0.17	0.07	41.17
3	Close Room Area	0.00	0.00	No dust detected
4	College Campus	0.26	0.19	73.07

Results

From observations we can say that overall efficiency is 61.41 % by taking average of all efficiencies.

Conclusion

The use of basil plants and a fresh air supplier that is powered by green energy has the potential to improve indoor air quality and lessen symptoms associated with respiratory problems. Our review showed that members who got the natural air provider revealed a critical improvement in their view of indoor air quality and a decrease in respiratory side effects contrasted with the benchmark group.

Green energy sources and air purifiers made of plants are in line with the principles of ecological balance and sustainability. It offers a promising way to deal with advancing sound indoor conditions while decreasing the carbon impression related with conventional air filtration frameworks.

However, there were some limitations to our study that need to be taken into consideration, such as the brief study period and the small sample size. Further exploration is expected to approve our discoveries and to investigate the adequacy of other plant-based air purifiers and environmentally friendly power energy sources in advancing sound indoor conditions.

In conclusion, the utilization of a fresh air supplier that is powered by basil plants and green energy is a promising strategy for enhancing the quality of the indoor air and decreasing symptoms of respiratory illness. As a sustainable alternative to conventional air filtration systems, it merits additional research and development.

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