1.1 Introduction

The Solar-Enabled Rechargeable Fan (SERF) with Integrated Peripheral Functions is an innovative project that aims to provide a reliable, eco-friendly, and cost-effective solution for cooling and ventilation. This project helps ease the burden of limited access to electricity in many parts of the world, particularly in rural or off-grid areas, where traditional fans are rendered useless during power outages. The project's importance lies in its potential to improve indoor air quality by circulating air and reducing stagnation, thereby minimizing the risk of respiratory issues, reduce heat-related illnesses, particularly for vulnerable populations, it offers a reliable and independent cooling solution for areas with frequent power outages or limited access to electricity.

The recent power bands scheduled by the power utilities company and the hike in the general commodities in Nigeria has put to question, the financial status of every citizen on the continuous reliance of the conventional electrical fans system. Hence the citizen has sort means of cool air ventilation using solar renewable system. Similar initiatives have been ventured into developing solar-powered ventilation systems, but this particular project stands out with its integrated peripheral functions, such as a built-in power bank for charging small devices, LED lighting, and a battery status indicator. These features make the project more versatile and user-friendly, setting it apart from existing solar-powered fans.

The world's shift towards renewable energy and sustainable living makes our SERF a timely innovation. As the world's focus intensifies on reducing carbon footprints and promoting eco-friendly practices, our solution is perfectly positioned to meet this need. By utilizing the power of solar energy, we can help reduce our reliance on fossil fuels and create a more sustainable future. our innovative fan is an important step in the right direction, most especially if all domestic gadgets can be placed on the used of renewable energy, it will create and free more power supply system for industrial usage and this practice is envisioned to boost our power supply chain and lower the competitiveness and need for the mains power supply system.

The industries sort after the need of effective power supply system for productive purposes such as manufacturing, processing of raw materials, preservation etc. This has the tendency to increase and scale up our local economy, while the renewable energy system can take care of the need of the citizen in areas that are not as financially productive as the industries (e.g for entertainment purposes) but essential for human existence and survival from boredom. This is evident in the influx of recent technology devices and the social media space that has grown in recent years. In fact many Nigerians occupied the social media space more than their conventional offices and many of the small and medium business enterprises has flourished in advertisement using the social media space. Besides the aforementioned, event on the social media now create awareness of happening in the society space than

the convention main stream media. The act has made the world indeed a global village.

The use of the Close Circuit TeleVision (CCTV) cannot be left out and the camera of real time happening using the mobile phone has create awareness of virtually anything and everything happening in the society. This act has limited and curtail the excessiveness of many oppressors in the society. Therefore, power these gadget and technology using the solar renewable energy system will serve as a giant stride in the world of electronic system.

1.2 The Problem Statement.

Millions of people worldwide, especially in developing communities, face significant challenges in accessing reliable and sustainable cooling solutions. This leads to a range of issues, including increased discomfort and heat-related health risks, such as heat exhaustion and heatstroke, due to hot weather conditions, limited access to cooling solutions for vulnerable populations, including the elderly, young children, and those with pre-existing medical conditions. The absence of affordable, eco-friendly, and energy-efficient cooling solutions in these communities exacerbates these problems. In response to these challenges, the Solar-Enabled Rechargeable Fan project will be developed to provide a sustainable, accessible, and innovative solution to address these pressing needs.

1.3 Aim of the Project

This project aims to design and construct a solar-enabled rechargeable fan with integrated peripheral functions such as USB charging ports, LED lighting, and a battery status indicator.

1.4 Objectives of the project

The objectives of the project are to:

i. design a fan that can be powered by solar energy and rechargeable batteries.
ii. integrate peripheral functions such as USB charging ports, LED lighting, and a battery status indicator into the fan.
iii. construct the fan with attention to durability, functionality, and ease of use.
iv. test the fan's performance under various environmental conditions and evaluate the efficiency of its solar charging system.

1.5 Scope of the Project

The scope of this project will leverage on the study of existing electrical rechargeable fan system to incorporated a solar charging system that will be independent of the mains power supply system. The proposed solar rechargeable fan system will not have the rotational ability of most fans to reduce the design complexity. However, this project will lays the groundwork for potential commercial production and future enhancements by focusing on the design, development, and testing of a solar-enabled rechargeable fan, this project seeks to provide an innovative solution for off-grid and developing communities, addressing their unique cooling needs while promoting sustainability and energy efficiency.