

UNIVERSITI TEKNOLOGI MARA

**DEVELOPMENT OF PORTABLE
WATER FILTER DEVICE**

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ABSTRACT

Access to clean drinking water is still a serious problem in the world, especially in areas with unstable clean water sources and a high risk of natural disasters. In order to provide clean drinking water from a variety of untreated sources, this study develops a portable water filter system. Designing, creating, and testing a small, effective water filtration system that can eliminate dangerous impurities like bacteria, sediments, and other pathogens are the main goals of this project. With a focus on usability, reliability, and filtration efficiency, the technique covers concept design, material selection, and prototype production. A battery-operated model with a stainless steel construction, a 12V water pump, and an activated carbon and ceramic filtering system was chosen after three design proposals were assessed using a Pugh selection chart.

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CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Access to safe drinking water is a fundamental human right that is necessary for life and the prevention of waterborne infections. In 2007, the World Health Organization (WHO) reported that over 1 billion people did not have access to potable water. Water-associated infectious illnesses kill up to 3.2 million people each year, accounting for around 6.00% of all fatalities globally [1]. In response to this serious worldwide issue, the project "Development of a Portable Water Filter Device" aims to meet the important demand for dependable and easily available water filtration technologies.

One of the biggest challenges facing this project is the contamination of water sources by a variety of pollutants such as sediments, bacteria, viruses, and chemical contaminants [2]. These contaminants give serious health risks, especially in areas with poor water treatment facilities. Water is needed for the survival of all living things, including humans. Humans can only survive for three to five days without water. The brain, for example, will begin to shut down, culminating in a stroke and possibly death. It has been clear that the globe is facing a significant crisis climate change [3].

Current water purification methods, such as boiling, chemical treatment, or relying on bottled water, frequently present practical challenges and limitations [4]. Boiling water costs gas and may not effectively remove all contaminants, while chemical treatments can be costly and risky to health if not used correctly. Furthermore, relying on single-use plastic bottles contributes to environmental damage.

To deal with these issues, we propose creating a portable water filter system capable of removing pollutants from untreated water sources. This solution combines modern filtration technologies into a compact, lightweight, and user-friendly device, allowing people and communities to successfully clean water in a variety of situations. The device intends to enhance access to secure water for consumption while also