INTRODUCTION

The displacement crisis of the Rohingya people has come out as one of the most pressing humanitarian challenges of the 21st century. With nearly 1000,000 Rohingya refugees (United Nations High Commissioner for Refugees, n.d.) currently residing in makeshift camps in Bangladesh. There is an urgent need for innovative solutions that not only provide basic accommodation but also bring up productivity and self-sufficiency (Milton et al., 2017). This paper aims to explore the development of an intelligent accommodation system for Rohingya refugees that integrates sustainable living conditions with opportunities for economic and social productivity ensuring security, imposing the capabilities of artificial intelligence (AI) to address these needs.

Problem Background

The Rohingya, an ethnic minority from Myanmar, have faced decades of systemic persecution, leading to mass displacement. The influx of refugees into Bangladesh, particularly in the Cox's Bazar region, has created partition on resources and infrastructure. Traditional refugee camps often focus exclusively on providing immediate relief, such as food and shelter, neglecting long-term sustainability and the potential for refugees to contribute economically and socially (Bhatia et al., 2018).

To illustrate the gravity of the situation, consider the story of Tasmin, a 51-year-old Rohingya woman who fled Myanmar's Rakhine State after horrific violence was waged against her ethnic minority group in late 2017. Tasmin and her five children escaped to the forests behind their home, hiking for eleven days before reaching the Naf River, which marks the border between Myanmar and Bangladesh. Tasmin's family was resettled in Kutupalong, where they joined nearly one million other Rohingya refugees. Tasmin's story reflects the extreme trauma and severe hardships that all Rohingya refugees endure in these overcrowded camps, where they face dire living conditions, including inadequate shelter, food shortages, and a lack of basic sanitation and healthcare. (Relief International, 2019).

Adding to these challenges, an alarming rise in crimes within the camps, including murders and drug-related offenses, has been reported. These crimes are often linked to the activities of armed groups such as the Arakan Rohingya Salvation Army (ARSA) and the Arakan Solidarity Organization (RSO) (The Daily Star, 2023). Moreover, the issue of Rohingya refugees obtaining fake Bangladeshi identification documents further complicates the security dynamics within the camps, creating an environment of instability and fear (The Dhaka Tribune, 2023). The rise in crimes can be attributed to several factors, including the lack of economic opportunities and the pervasive sense of hopelessness among refugees. Many jobless youths, facing severe economic deprivation, become involved in criminal activities as a means of survival. Additionally, the competition among armed groups for control over illegal activities such as drug trafficking and extortion fuels further violence and instability within the camps (Dhaka Tribune, 2023).

The problems that this research aims to address can be broadly summarized into two main issues. First, there is the challenge of inadequate living conditions and the lack of long-term sustainability in current refugee accommodation, which hampers the economic self-sufficiency and social

productivity of the Rohingya refugees. Second, there is the issue of escalating security problems within the camps, including crime and the misuse of identification documents, which further destabilizes the already precarious environment. This paper addresses the critical need to rethink refugee accommodation from a perspective that includes productivity, self-reliance, and enhanced security.

Related Studies

The conditions within Rohingya refugee camps have been the subject of various academic studies, each shedding light on different aspects of the refugee crisis. For instance, Bhatia et al. (2018) provide an in-depth analysis of the living conditions in the camps, emphasizing the inadequacy of basic facilities and the lack of economic opportunities. Their study underlines the dire need for improved infrastructure and sustainable living conditions but falls short of proposing actionable solutions for long-term self-sufficiency and economic integration.

Similarly, Milton et al. (2017) focus on the health challenges faced by the Rohingya refugees due to overcrowding and poor sanitation. While this study offers valuable insights into the public health crises within the camps, it does not explore the broader socio-economic factors contributing to these conditions or how technology could be used to mitigate them.

The research by Ahmed et al. (2019) further explores the status of Rohingya refugees in Bangladesh, highlighting the extreme hardships they endure, including inadequate shelter and limited access to education and healthcare. However, like the previous studies, it does not address the potential of integrating technological solutions to improve the overall quality of life and security within the camps.

Hossain et al. (2020) delve into the security issues within the camps, particularly focusing on the rise in crimes and the involvement of armed groups. Their research underscores the complex security dynamics in the camps but does not consider how AI and other advanced technologies could be leveraged to enhance security and stabilize the environment.

Despite the valuable contributions of these studies, there is a noticeable gap in the literature regarding integrated solutions that combine sustainable living conditions with productivity-enhancing features and advanced technologies like AI. None of the existing research comprehensively addresses the need for a holistic accommodation system that not only meets the basic needs of the refugees but also empowers them to achieve economic self-sufficiency and social productivity while ensuring their security.

This research aims to fill that gap by proposing an intelligent accommodation system that incorporates AI to optimize resource allocation, enhance security, and support economic integration within the refugee camps. By addressing these gaps, this study will contribute significantly to the field of humanitarian aid and refugee studies, offering a model that can be adapted and implemented in similar contexts globally

Research Objectives

This research aims to develop an intelligent accommodation system for Rohingya refugees that integrates sustainable living conditions with opportunities for economic and social productivity. The primary focus is on designing a system that ensures long-term sustainability, addressing both the immediate and future needs of the refugees. This involves creating a framework that not only

meets basic needs, such as shelter, sanitation, and healthcare but also incorporates sustainable practices that reduce environmental impact and ensure the availability of resources over time.
In addition to sustainability, the research seeks to identify and incorporate economic activities that can be supported within the accommodation system. This is aimed at transforming the refugee camps from mere places of temporary relief into dynamic communities where refugees can engage in productive activities, thereby promoting self-sufficiency. The integration of economic opportunities is essential for empowering the refugees to contribute meaningfully to their community and the host country.
Moreover, the research emphasizes the implementation of AI technologies to optimize resource allocation, enhance security, and support economic integration within the camps. AI will be used to monitor resource use, predict future needs, and ensure the safety and security of camp inhabitants. This holistic approach addresses the inadequacy of current refugee accommodation systems, which often fail to provide more than temporary relief. By answering the question, **"How can we develop an intelligent accommodation system for Rohingya refugees that also facilitates their productivity and ensures their security using AI?"**, this research aims to offer a comprehensive solution that not only meets the immediate needs of the refugees but also empowers them for a more self-sufficient and secure future, ultimately reducing the socio-economic burden on the host country.

Research Contributions

This research contributes to the fields of humanitarian aid, refugee studies, and AI-driven social innovation by proposing a comprehensive framework for developing intelligent accommodation systems tailored to the needs of Rohingya refugees. The study will offer actionable insights for policymakers, NGOs, and international organizations by demonstrating how AI can be leveraged to create sustainable living environments that also enhance economic and social productivity among refugees. Specifically, this research will provide a detailed blueprint for integrating AI into resource management, security enhancement, and economic development within refugee camps. By addressing both immediate needs and long-term challenges, the proposed solutions aim to empower refugees, reduce dependency on external aid, and promote meaningful integration with the host community. This approach not only enhances the dignity and well-being of the refugees but also mitigates the socio-economic burden on the host country by fostering self-sufficiency and reducing security risks.