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THE IMPACT OF CLIMATE CHANGE ON SDGS 13 IN THE MALDIVES WITHIN A HUMAN SECURITY FRAMEWORK

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Abstract

The small islands are important for ocean resilience against climate change risk. While at the same time the small islands are facing serious problems for environmental degradation as seen through higher temperature, miscellaneous disaster, sea level rise, and so forth. Thus, the problems are getting worse for unachieved Sustainable Goals, for instance limited access to education, lower economic growth, and unaccessed economic development in the small islands. The higher risk for carbon emission in the industrialization era also involved the small islands, especially in the Pacific Ocean, where all the international trade carried out all the way through. Small Island Developing States (SIDS) for renewable energy is a matter for small islands. The lighthouses projects provide a best practice of a global partnership. Thus, a waste management system to create green energy in small islands is important. Methodology of the research is qualitative based on articles review and analyzing data from several resources such as books and legal reports of the United Nations. Hypothesis of the research is that international engagement troughs for small islands help local communities to survive and achieve SDGs in the industrialization era.

Keywords: Small Island Developing States (SIDS), Sustainable Developing Goals (SDGs), human security, climate change, Pacific Islands.

INTRODUCTION

Climate change is a complex and urgent global challenge, with highly uneven impacts. Small island nations like the Maldives are at the forefront of this crisis (Kapoor et al., 2021) with challenge on low-lying location, dependence on coastal natural resources, and limited adaptive capacity make them highly vulnerable to climate impacts such as sea-level rise, extreme weather events, and coastal erosion (Moosa, 2024). These changes not only disrupt the ecological balance but also threaten the survival of entire communities. Sustainable Development Goal (SDG) 13 calls for urgent action to combat climate change and its impacts (Dagnachew et al., 2021). However, as the United Nations Development Programme (UNDP) emphasizes, the consequences of climate change do not stop at the environmental dimension alone, but extend to various aspects of human security, such as

food security, health, shelter, and livelihoods (Saidah et al., 2025). One dimension that is significantly impacted is food security, which affects the quality of life of island communities and places them in a state of long-term uncertainty (Perbina et al., 2022). While there is a growing body of research on the impacts of climate change in island regions, most of it still focuses on technical mitigation and macro policy responses. There are still few studies that explicitly examine the relationship between climate change, achieving SDG 13, and the framework.of human security, especially in the context of a small island nation like the Maldives. In fact, the human security approach provides a more holistic perspective by placing humans at the center of policy analysis and intervention.

From here arises the research gap that this study seeks to bridge, namely the need for an integrative understanding of how climate change affects the achievement of SDG 13 in the Maldives when viewed from a human security perspective. This is important to explore not only the physical threats of climate change, but also the socio-economic impacts that weaken the resilience of island communities. Based on this context, the main question asked in this study is how climate change impacts the achievement of SDG 13 in the Maldives when analyzed through the framework of human security? This study aims to identify the forms of climate change threats to the human security dimension in the Maldives, analyze the relevance and effectiveness of policies related to SDG 13 in the local context, and explore the potential for international collaboration in supporting the adaptive capacity and resilience of local communities. By placing the framework human security as the main analytical lens, this research seeks to contribute to a deeper and more contextual understanding of the challenges and opportunities in achieving sustainable development in the island regions most affected by the climate crisis.

In addition, it is important to highlight that the human security approach in the context of climate change in the Maldives also opens up space to assess climate justice as a central issue. Small island states such as the Maldives, whose contribution to global greenhouse gas emissions is minimal, bear the brunt of the impacts of climate change. This inequality creates moral and political challenges in the global climate governance architecture. In this situation, strengthening the adaptive capacity of local communities cannot be separated from fair and sustainable international support. For example, access to climate finance, environmentally friendly technologies, and knowledge transfer are crucial to strengthening the resilience of coastal communities.

Furthermore, the analysis of the Maldives' national strategy in implementing SDG 13 also needs to consider cultural sensitivity and local context, so that the policies designed are not only top-down, but also rooted in the real needs of the community. Therefore, this study is not only important for understanding the impacts of climate change in terms of physical and social vulnerability, but also as an effort to assess the effectiveness of global solidarity and international commitments in supporting vulnerable countries towards inclusive and equitable climate resilience.

Literature Review

SDG 13 (Climate Action) is one of the sustainable development goals that calls for urgent action to address climate change and its impacts (Idrus & Usi, 2024). This goal is cross-sectoral and closely interlinked with a number of other SDGs, such as SDG 2 (Zero Hunger), SDG 6 (Clean Water and Sanitation), SDG 11 (Sustainable Cities and Human Settlements), and SDG 14 (Marine Ecosystems). In the context of an island nation like the Maldives, the linkages between SDG 13 and other SDGs become even more relevant, given the high vulnerability to climate change, especially sea level rise and its impacts on food security, water, settlements, and coastal ecosystems.

The human security approach developed by UNDP (1994) is an important conceptual framework to analyze the impacts of climate change in a multidimensional manner. (Adinda FA, 2019) Human security consists of seven main dimensions: economic, food, health, environmental, personal, community, and political security. (Maulana et al., 2024) This approach shifts the focus from state security to individual protection, highlighting that threats to human survival are not always in the form of violence, but can also be in the form of environmental degradation, natural disasters, or climate crises.

In the context of climate change, the food security dimension becomes very crucial, especially in coastal areas and island countries. Various studies in Indonesia show that coastal communities experience significant disruptions in food production and distribution due to tidal flooding, abrasion, seawater intrusion, and changes in weather patterns. For example, (Ashari, 2023) in Kabung Island found that sea level rise and extreme rainfall shrink agricultural land and hamper fishing activities. Research by (Fatsrian, 2024) in Pari Island highlighted the increasing frequency of tidal flooding, damaging food infrastructure and worsening the community's economy. Meanwhile, Novianti (2015) linked the damage to coral reefs in East Lombok with a decline in fish populations, which has an impact on the nutrition and income of fishermen.

However, most of these studies still focus on technical aspects or macro policies, with limitations in explicitly linking them to the SDG 13 framework and human security approach. Lim's study (2018), for example, emphasizes the legal and justice aspects of climate for small island states (SIDS), but has not yet reached the social and economic dimensions of affected communities as a whole. Therefore, a more integrative study is needed that directly links the impacts of climate change to the achievement of SDG 13 through the lens of human security.

Important lessons can be learned from the study by (Sinaga, 2023) on Kiribati, one of the SIDS countries in the South Pacific that faces serious threats from rising sea levels. Impacts such as saltwater intrusion, drought, and loss of agricultural land have forced Kiribati to develop adaptation, mitigation, and even relocation strategies. Migration with dignity promoted by the Kiribati government illustrates a form of social and political adaptation to the climate crisis, while maintaining the dignity of its citizens. The case of Kiribati is relevant to be analogized with the conditions of the Maldives, which is also an atoll country with low altitude and high dependence on coastal ecosystems.

Given the linkage between SDG 13 and the human security approach, the analysis of the Maldives must consider the impacts of climate change not only from an ecological perspective, but also from a social, economic, and cultural perspective. The multidimensional nature of climate change threats suggests that achieving SDG 13 cannot be separated from the integration of adaptation policies that protect vulnerable groups, ensure food and water security, and strengthen socio-ecological systems in coastal areas. Therefore, this study places human security as the primary analytical framework for understanding the dynamics of climate change and its implications for the success of the SDGs in the Maldives and other similar regions.

METHODOLOGY

In writing the methodology, clarity and completeness are essential. IICIS instructs authors to explain the research approach, mode of study, data collection techniques, and data analysis procedures. Authors are welcome to elaborate further by dividing this section into subsections if needed. The formatting in this section should mirror that of the introduction: Garamond 12 pt, 1.5 spacing, justified, with a 1.25 cm indent at the start of each paragraph. No numbering is used for the section headings, and the heading is written in bold uppercase letters.

This study was conducted with a quantitative approach process using a survey design through a questionnaire developed with a 5-point Likert Scale. A total of 25 questions were distributed to respondents with 5 questions related to demographics, and 20 questions related to public perception and assessment of the Impact of Climate Change on SDGs 13 in the Maldives and its relationship to aspects of human security. Data collection was carried out by distributing questionnaires through Google Forms. Each main question is related to the concept of human security which is the framework of this research. The Likert scale is used as a measurement scale to analyze respondents' answers with a certain score with a range of answers from 1 to 5 from Strongly Disagree to Strongly Agree. The targeted respondents consisted of 80 people from various circles ranging from policy makers, environmental activists, academics, to the general public.

Table 1. Relations among human security dimensions and SDGs

Human Security Dimensions	Related SDGs
Environmental	SDG 13, 14, 15
Food & Water	SDG 2, 6, 12
Health	SDG 3, 6, 13
Economic	SDG 1, 8, 10
Political	SDG 16
Community/Social	SDG 5, 16, 17, 9
Individual	SDG 10, 11, 7, 4

Source: Compiled by authors

This study refers to the human security approach developed by UNDP (1994) which consists of seven dimensions as an analysis framework. The collected data were then analyzed descriptively to describe the tendency of respondents' answers. This framework is used to map public perceptions of the implications of climate change on every area of daily life. Respondents' answers are categorized based on their relationship to the Sustainable Development Goals (SDGs) indicators. Furthermore, the analysis of respondents' answers is collected into 7 aspects of human security starting from the environment, food, health, economy, politics, community, to individuals.

RESULTS AND DISCUSSION

Result

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Table 2. Survey Result Based on Human Security Dimensions

Human Security Dimensions	Average Score	Percentage of Respondents	Main Point
Environmental (SDG 13, 14, 15)	4,27 / 5	43% (Totally Agree)	Climate change threatens the homes, livelihoods and ecology of SIDS communities.
Food & Water (SDG 2, 6, 12)	4,13 / 5	36% (Agree)	Extreme climates reduce food and clean water yields, increasing import dependence in SIDS.
Health (SDG 3, 6, 13)	3,8 / 5	36% (Agree)	Climate change exacerbates health risks and limits medical services in SIDS.
Economic (SDG 1, 8, 10)	4 / 5	48% (Agree)	Climate change is disrupting livelihoods and widening economic disparities in SIDS.
Political (SDG 16, 19)	4,11 / 5	46% (Agree)	SIDS governments are not yet responsive and not ready with long-term evacuation systems to deal with the climate crisis.
Community/Social (SDG 5, 16, 17, 9)	4,05 / 5	35% (Agree)	Vulnerable groups affected by climate disasters, migration triggers instability, and SIDS need global support and human security-based development.
Individual (SDG 10, 11, 7, 4)	4,16 / 5	30% (Agree)	Climate disasters exacerbate health access, social impacts, and education disparities in SIDS, especially for vulnerable groups.

Source: Questionnaire respondents, compiled by authors.

Environmental Security

The results of the study showed that the majority of respondents, namely 43%, strongly agreed with the relationship between climate change and increased intensity of natural disasters or environmental disasters in SIDS. This perception is not only a form of public concern about the risks of climate change, but also a collective awareness of the impact on the sustainability of life in coastal areas. Climate disasters such as rising sea levels, tropical storms, and droughts are evidence of the direct impact of climate change which also threatens access to vital infrastructure and the homes of coastal communities, including the Maldives (Caldeira et al., 2025). By this, we can see the public perception that sees a significant impact of climate change on natural conditions around the coast of the Maldives.

Another impact that is a domino effect of climate change is the lack of clean water sources due to drought. Not only housing, even the basic needs of the community are threatened (Manhas, 2024). This is in accordance with the statement in the International Finance Corporation report that coastal areas in the Maldives face erosion caused by rising sea levels. In addition, climate change has an impact on the growth of coral reefs and marine ecosystems. This will be worse if the water temperature is unstable. Water temperature is crucial in the sustainability of marine ecosystems, both coral reefs and fish. Unstable water conditions can result in threats to biodiversity and a decrease in the number of fishermen's fish catches (Finance Corporation, 2023).

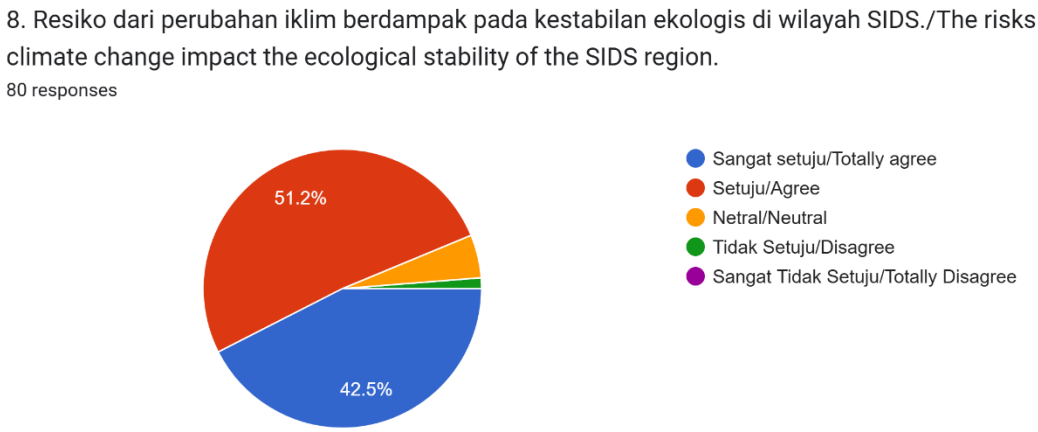

Figure 1. Respondents' perception of the impact of climate change on economic inequality in SIDS
Source: Results of the research questionnaire, compiled by the author, 2025.

According to the questionnaire results, the vast majority of participants think that the ecological stability of SIDS is impacted by the dangers associated with climate change. This number shows that people are quite aware of how sensitive small island developing states' ecosystems are to the effects of climate change, including coastline erosion, sea level rise, and coral reef bleaching. There is broad agreement on the ecological dangers facing the area, as seen by the low percentage of respondents who were neutral or disagreed. These results highlight how crucial ecosystem-based strategies are to preserving the sustainability of the SIDS region and how urgent environmental conservation is in climate adaption programs.

The Maldives is working to provide renewable energy in response to environmental concerns. A remote island's clean energy mix can be greatly enhanced by combining renewable energy sources like solar panels, wind turbines, and battery storage. If the right

combination is used in their design, these hybrid systems can save operating costs and carbon emissions (He et al., 2021). Wave energy and floating solar panels are two examples of offshore floating technology that could offer the Maldives a dependable renewable energy source. This strategy is thought to be theoretically possible in order to facilitate the shift to entirely renewable energy without depending on finite amounts of onshore land (Keiner et al., 2022). In this sense, the Maldives is actively utilizing renewable and green energy to combat climate change.

Food and Water Security

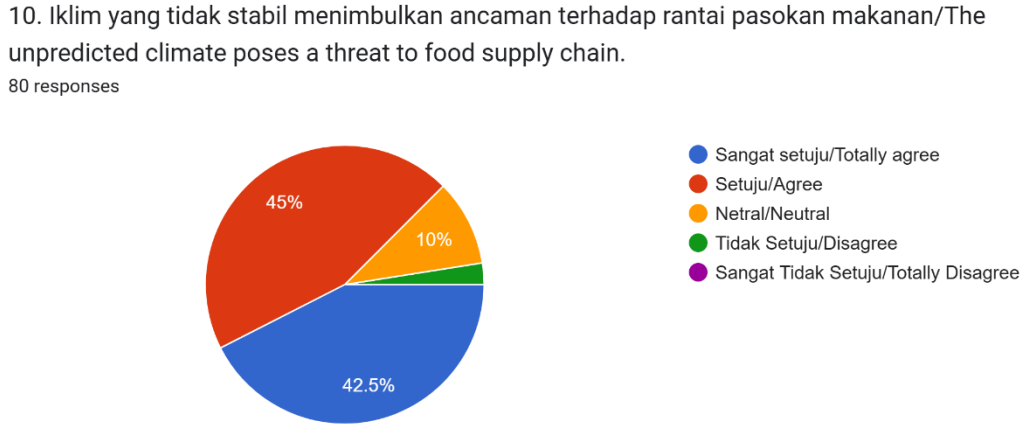

Figure 2. Respondents' perception of the threat of a volatile climate to the food supply chain
Source: Results of the research questionnaire, compiled by the author, 2025

According to the diagram, most respondents acknowledge that food supply systems are seriously threatened by an erratic environment. Over four-fifths of survey respondents agreed or strongly agreed, indicating a general understanding that the production, distribution, and availability of food can be disrupted by changing weather patterns. This risk is especially significant for small island states that depend on imports and small-scale agriculture. The significance of food sector adaptation measures to improve regional and national food security was confirmed by the small percentage of respondents who were neutral or disagreed.

Food security is quite crucial in the dimension of human security. This dimension is related to SDG 2, namely ending hunger, achieving food security, improving nutrition, and promoting sustainable agriculture. Other related SDGs are SDG 6, clean water and sanitation, and SDG 12, responsible consumption and production. This is important because food is a basic need for all humans that must be met every day. Based on the study, the

majority of respondents agreed that there was a food threat in the SIDS region. People living in coastal areas depend on seafood as their food and source of income. As many as 43% of respondents agreed with the statement that unstable climate causes a decline in agricultural and fisheries yields in SIDS. This perception is evidence of public awareness that climate change does not only affects one sector, but other crucial sectors including food as a basic need for all humans.

Climate change has an impact on unpredictable weather, uncertainty of planting times, and the threat of increased pest attacks. This causes a decrease in harvest yields and if it continues can reduce domestic food supplies in the Maldives. Another impact is changes in soil conditions which in the case of the Maldives have land with limited crop yields. Food sources that cannot be produced domestically then rely on imported supplies (Van Driessche, 2024). One of the Maldives' mainstay countries in food imports is Sri Lanka. This shows that an unstable climate can cause dependence on food imports. Meanwhile, dependence on food imports will cause the country's foreign exchange from the food sector to decrease because the country cannot even meet domestic food needs. In addition, the SIDS region is surrounded by waters so that there will be additional distribution costs from the main island to reach the island nation. This situation is also very possible in other SIDS regions. Commodity prices in SIDS will be much more expensive due to additional transportation compared to prices on the main island (United Nations, 2023).

Health Security

The survey results showed that 36% of respondents agreed with the statement regarding the link between climate change and health conditions in SIDS. This health security is closely related to SDG 3, namely ensuring health and well-being for all. Unpredictable climate change can cause a decrease in the body's immunity, making it more susceptible to disease. Changes in temperature, air pollution, and food shortages that cause malnutrition are threats to public health, including in coastal areas. In addition, this dimension is related to SDG 6, namely ensuring the availability and sustainable management of clean water and sanitation for everyone. The problem faced is seawater intrusion which also causes a reduction in clean water sources so that they cannot meet the needs of the community, especially in the SIDS region. As a small island nation, the SIDS region is more vulnerable to the impacts of seawater intrusion and is threatened with difficulties in meeting clean water needs. This can disrupt residents' sanitation and clean water consumption needs. Meanwhile, alternative clean water is difficult to reach or even unavailable (Susilawati, 2021).

The above statement is in line with health reports in the Maldives. The increase in temperature that occurs causes fatigue, dehydration, skin diseases, and respiratory disorders. It is reported that many fishermen in the Maldives fainted due to the heat while working. In addition, extreme temperatures also have an impact on increasing pollution in the country. Another impact is the increase in vector diseases such as dengue fever due to climate conditions that support mosquito breeding (Abbasi, 2025). The Maldives also reported many residents who have mental health disorders related to physical stress and economic instability. The increase in temperature and inter-island migration in the Maldives increase the anxiety of the affected community. In addition to increasing health disorders, health services in the Maldives are also affected. There are 184 health facilities and hospitals serving 200 inhabited islands in the Maldives. Unstable access to communication and mobilization to health facilities can exacerbate public health risks (Kapoor et al., 2021).

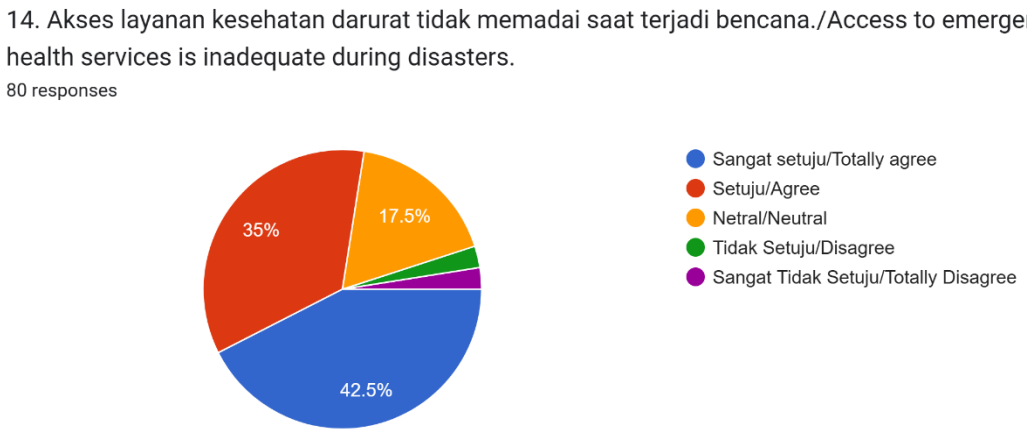

Figure 3. Respondents' perception of the adequacy of emergency health services during a disaster
Source: Results of the research questionnaire, compiled by the author, 2025

According to one of the survey's findings, the majority of participants think that emergency medical services are not readily available during disasters with 42.5% strongly agree and 35% agree. A common concern for inadequate health response systems in disaster scenarios is shown in this high degree of agreement, particularly in vulnerable areas like Small Island Developing States (SIDS), which frequently suffer logistical and infrastructure constraints. Just around 5% of respondents disagreed, indicating that the idea that there aren't enough health services is widely held. This result is consistent with research on disaster management and climate change adaptation, which highlights how communities might be worse affected by disasters when they lack access to essential services like health care.

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Economic Security

The economic security dimension relates to SDG 1, which is zero hunger, 8, which ensures decent work and economic growth, and 10, which is efforts to reduce inequality. The majority of respondents agreed with the statement that refers to the relationship between climate change and the economy in SIDS regions. SIDS regions rely on vulnerable sectors such as fisheries, agriculture, and tourism for their economic activities. The livelihoods of SIDS communities, especially fishermen and farmers, are highly dependent on climate conditions. Climate disasters can hamper livelihoods and impact poverty in coastal communities (Panwar et al., 2024). This can increase economic disparities between communities. The fulfillment of food needs will also be disrupted and spread to dependence on import supplies. In this situation, the greatest risk is the impact on the country's fiscal finances due to dependence on imports.

In the context of the Maldives, tourism is one of the mainstay livelihoods. This sector is the largest contributor to GDP in the Maldives. Climate change can disrupt the tourism sector through environmental damage that disrupts the tourism industry's resources, namely the environment and nature. This causes a decline in tourist attractions, thereby reducing national income. The recovery process also requires a lot of money. Another major sector is fisheries, where the Maldives is one of the largest tuna exporters (Jayaraman & Makun, 2022). Climate instability disrupts fishermen's catches which if it continues will have an impact on the national economic conditions of the Maldives. This is because the fisheries sector is the main sector contributing to the country's foreign exchange after tourism in the Maldives.

The Maldives also experiences a commodity price gap when compared to the mainland countries. The main causes are differences in economic structure and dependence on exports. With a lack of diverse natural resources, the Maldives relies on imports to meet its needs for goods, food, building materials, and fuel. This dependence increases the price of these commodities compared to prices in producing countries. The Maldives, with its limited land area and small population, is an obstacle to the scale of its domestic production. Although tourism is a driver of the economy, this sector also contributes to price increases in the Maldives. Demand for goods and services can increase prices around tourist areas such as resorts and hotels. For example, accommodation in the Maldives is more expensive than accommodation on the mainland (World Bank, 2024). This data shows the contrast between the economic disparity between small island states and major islands.

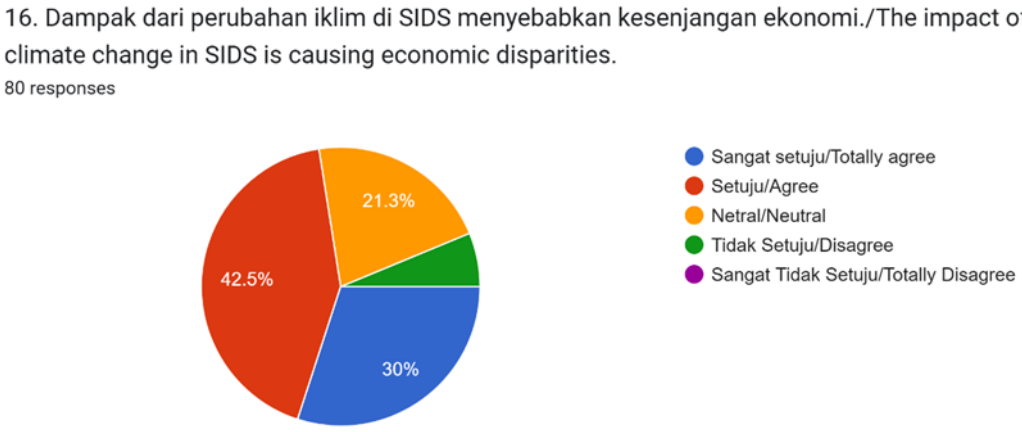

Figure 4. Respondents' perception of the effect of climate change on ecological stability in SIDS
Source: Results of the research questionnaire, compiled by the author, 2025

One of the statements stating the impact of climate change in SIDS is causing economic disparities received a majority of agreeing responses. This community perception is in line with the findings of Gussmann and Hinkel (2021), who argue that the outcome of post-tsunami relocation on one island, Laamu Atoll, Maldives, was not primarily driven by adaptation needs, but by political and economic interests (Gussmann & Hinkel, 2021). Their research explains how access to power and economic strength allows certain communities to benefit from relocation programs, while others are left behind, and highlights how climate impacts can exacerbate existing socio-economic disparities. The strong agreement in this survey reinforces the idea that climate change is not just an environmental issue, but also a catalyst that deepens economic injustice in vulnerable island contexts.

Political Security

Based on the questionnaire results, 46% of respondents agreed that government and local institutions were not responsive enough in ensuring community climate security. The majority of respondents expressed concerns about institutional capacity and capability in dealing with climate issues, especially in the context of an island nation. As an island nation, the Maldives has a higher risk of natural disasters due to climate change. It can be seen that there is an imbalance between community needs and government policies in terms of disaster mitigation to relocation systems. As a policy maker, the government is not sufficiently prepared for the possibility of climate disasters. Communities in island nations also do not

have alternative evacuation sites in the event of a climate disaster. This is also an indication of low community participation in the climate policy formulation process.

While a majority still believe in the role of institutions, the 27.6% of perceived unachievement shows a substantial level of public distrust. In the context of SDG 16, effective, accountable or transparent, and inclusive institutions are highly emphasized. The majority of respondents' answers are in line with the Westminster Foundation for Democracy (WFD) report which shows the political conditions in the Maldives. WFD reported that Maldivian politics are filled with transactional practices, where politicians spend a lot of money to buy people's votes up to 2 to 15 million MVR. The ruling party also often uses state resources to win the competition. Meanwhile, the people's participation is affected by the practical politics of politicians. Maldivian society is easily tempted by monetary rewards or direct assistance compared to the vision, policies, or ideology of political candidates (Shaafiu et al., 2025). Young people also feel hopeless and reluctant to get involved because politics is controlled by political elites with their practical politics. This condition is also compounded by the lack of women's roles in parliament with high levels of harassment and discrimination against women in parliament.

Beyond political participation, environmental policy in the Maldives also has several shortcomings and challenges. According to a World Bank report, the Maldivian government spends 80% of its coastal protection budget on “grey” infrastructure such as breakwaters rather than more natural solutions such as mangrove and coral reef restoration. Environmental law enforcement is also weak, with land reclamation and sea sand mining continuing without clear regulations and environmental impact assessments. Coordination between government agencies with limited technical and fiscal capacity is also suboptimal. In addition, monitoring and maintenance of marine ecosystems such as water quality and fish stocks are also inadequate. In fact, more than 60% of the Maldives' GDP comes from the tourism and fisheries sectors, which are the sectors that increase the impact of ecosystem damage due to waste and over-exploitation (World Bank, 2024). This shows how important climate-related political policies are to the survival of Maldivian society.

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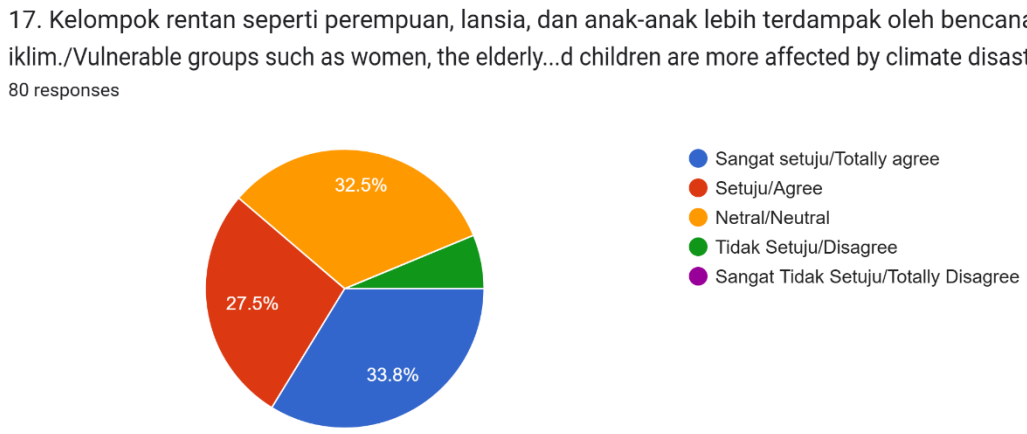

Figure 5. Respondents' perception of the level of vulnerability of vulnerable groups (women, children, elderly) in the face of climate disasters
Source: Results of the research questionnaire, compiled by the author, 2025

The previous data supports the survey results in this study. According to the above statement, most respondents agreed that vulnerable populations including women, the elderly, and children are disproportionately impacted by climate disasters. This demonstrates a high level of understanding of the unequal effects of climate change, where risks are often higher for those with less capacity for adaptation. Although there are many who are neutral or disagree, the prevailing opinion shows that social vulnerabilities must be taken into account when developing adaptation and protection strategies for disadvantaged populations in the context of the climate catastrophe. To make disaster response more inclusive, social justice-based initiatives must be incorporated into public policies. The resilience of a community as a whole can also be increased by actively including vulnerable groups in adaptation planning.

Community/Social Security

The research showed that the majority of respondents agreed with the statement that climate change is linked to community security as one of the dimensions of human security. According to an ILO report in May 2025, only 40-60% of the population is supported by a medium-level social protection system, which is not up to the standard needed to deal with the climate crisis. In addition, they have no alternatives to continue living in island nations. This is in line with the findings of Bischler (2025) which states that the most affected groups are vulnerable groups such as women, the elderly and children (Jana Bischler et al., 2025). This is because traditional gender-based roles require women to interact more and be

responsible for household conditions. Meanwhile, the elderly and children are physically vulnerable to diseases caused by climate instability.

On the other hand, climate change in SIDS has an impact on the instability of almost all aspects of life. As a result, many SIDS residents choose to migrate to other areas or to the mainland in the hope of getting a more secure livelihood. However, this becomes a problem when migration becomes a source of social conflict in the area of origin and the recipient area. SIDS areas that are not too large can experience a decline in human resources because many people with abilities or who are of productive age choose to move to the mainland. Meanwhile, in the main area as the recipient, there is social conflict due to competition between the native workforce and immigrants from the SIDS area. Without clear regulations, migration of SIDS people can cause more serious problems (International Organization for Migration, 2024). To deal with this, there needs to be proper regulation so that employment opportunities are more evenly distributed and adequate for people in the SIDS area.

In terms of migration and protection of vulnerable groups, international cooperation is essential so that the steps taken can run well. Migration handling must involve many international parties, both SIDS countries and countries on the main islands. Special attention is needed for vulnerable groups, especially children who will later become successors in the SIDS community (Biasio, 2024). As a global problem, international support is essential in helping SIDS communities adapt. Climate stability is not only for the welfare of SIDS communities, but can also have an impact on human welfare throughout the world. Climate action is one of the points in the sustainable development goals which are a common goal. Sustainable development can be achieved through a human security approach which goes through stages starting from domestic efforts to international cooperation. In the Maldives context, climate change severely impacts vulnerable groups especially those living on small islands and small atolls. Climate risks exacerbate inequalities and threaten Maldivians' access to health, food, and local income including fisheries and tourism. Flooding in the Maldives has forced many residents to be temporarily relocated, weakening island communities' capacity for social cohesion and increasing structural burdens (Moosa, 2024). In this regard, adaptive community policies and social protections such as unemployment insurance and universal health coverage are necessary. Adaptive policies include the integration of social protection systems through disaster insurance and community-based economic protection. Women, indigenous peoples and local communities also need to be

involved in the planning and implementation of adaptation programs (United Nations, 2023).

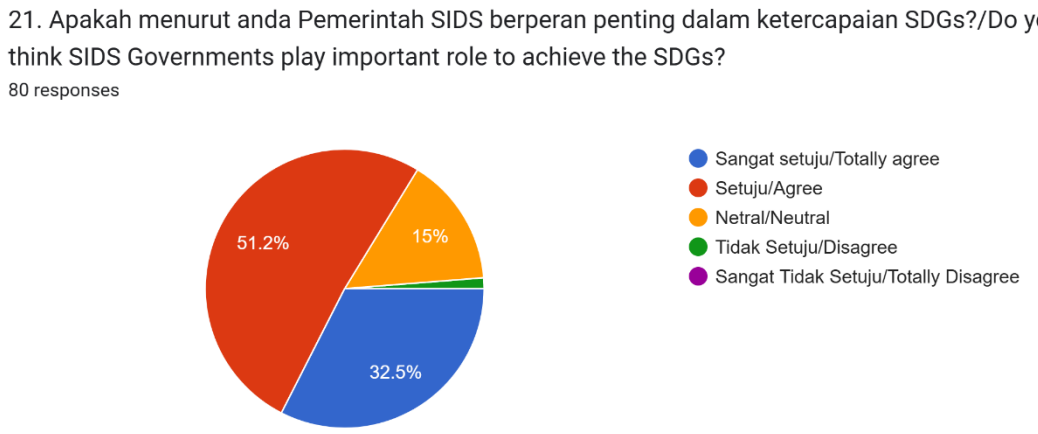

Figure 6. Respondents' perception of the role of SIDS governments in achieving the Sustainable Development Goals (SDGs)
Source: Results of the research questionnaire, compiled by the author, 2025

The data supports the survey results in that most respondents believe that governments in SIDS countries have an important role to play in achieving the Sustainable Development Goals (SDGs). This illustrates the belief that national and local governments' commitment, policies, and ability to carry out global goals like the SDGs are critical to their success. The majority of votes acknowledged the significance of the government's position as a primary force behind sustainable development, despite a small percentage being neutral or disagreeing. Government policy support is thought to be essential for promoting community involvement, managing resources fairly, and enhancing resilience to global issues like social inequality and climate change.

Personal Security

Respondents' answers showed that the majority, namely 30%, agreed with the statement that climate change poses a real threat to individual security. This threat is especially greater for vulnerable groups including the elderly, women, and children in SIDS. In addition, women in the Maldives face restrictions on movement compared to men due to prevailing social norms. The individual security referred to includes basic human rights to live safely, adequate health services, education, and social protection especially when climate disasters occur. In individual security, respondents supported the statement that access to emergency health services is inadequate during disasters. This shows that islanders cannot access health care evenly in disaster situations such as floods or storms. This is an indication

of the lack of readiness of crucial services for disaster management and response (Borg Axisa et al., 2024).

The second point is the risk of climate disasters that have a greater impact on vulnerable groups. The majority agree to support the argument that social inequality exacerbates its impact. This argument is supported by the International Organization for Migration (IOM) report that 4% of the Maldivian population outside Male is in areas at high risk of sea level rise by 2050. Several islands with more than 70% of the Maldivian population are at risk of flooding and water intrusion. In fact, Male as the capital is expected to be exposed to an intensification of flood risk related to extreme rainfall until 2060 in a high climate scenario. Although there has been assistance from UNDP, ranging from rain harvesting systems, solar-powered desalination plants and wastewater management systems, the distribution is not evenly distributed. In addition, migrants who make up 25% of the Maldivian population have difficulty accessing emergency services because many of them are undocumented (International Organization for Migration, 2024).

Another point is the unequal education between small and large islands in the context of an archipelagic state. This statement is supported by research showing the unequal distribution of educational facilities in the Maldives (Azlifa & Saeed, 2021). Equipment such as smart TVs, projectors, and laptops are more widely available in large schools in Male and other large islands than in small islands. The internet network available on small islands only reaches 4-8 Mbps and is not enough for two classes to use at once. This has an impact on the limited number of trained teachers to provide education on climate change, mitigation, and technology-based adaptation. Children from low-income families do not even have internet access at home. Digitalization, which should be a path of adaptation amidst the threat of disaster, is now reducing the adaptive capacity of individuals to climate risk.

Figure 7. Respondents' perception of the gap in access to education between small and large islands
Source: Results of the research questionnaire, compiled by the author, 2025

The data matches the results of the questionnaire, which showed that most participants felt that education in small island regions is still inferior to that in large island regions. This shows that development centers and isolated places like small islands have different access to and standards of education. Lack of teaching personnel, inadequate educational facilities, and a lack of infrastructure and support for technology are a few examples of these discrepancies. In order to guarantee that all areas, even small islands, have equal opportunity to develop their human resource potential, this view highlights the significance of affirmative action laws and more fair educational investment.

Percentage of SDGs Realization

Table 3. Survey Result Based on SDGs

SDGs Number	Goal Focus	Achieved	Not Achieved
1	No Poverty	81.3%	18.8%
2	Zero Hunger	87.5%	22.5%
3	Good Health and Well-Being	93.9%	20.6%
4	Quality Education	88.7%	11.3%
5	Gender Equality	61.3%	38.8%
6	Clean Water and Sanitation	76.3%	24.3%
7	Affordable and Clean Energy	80.1%	20%
8	Decent Work and Economic Growth	81.3%	18.8%
9	Industry, Innovation and Infrastructure	86.3%	13.7%
10	Reduced Inequalities	72.5%	27.6%
11	Sustainable Cities and Communities	77.6%	22.4%
12	Responsible Consumption and Production	77.5%	22.4%
13	Climate Action	97.1%	3.3%
14	Life Below Water	87.5%	13.8%
15	Life on Land	91.2%	8.8%
16	Peace, Justice and Strong Institutions	80.0%	20.0%
17	Partnership for the Goals	81.3%	18.3%

Source: Questionnaire respondents, compiled by authors.

The table above summarizes public perceptions regarding the achievement of each Sustainable Development Goal (SDG) in the context of climate change impacts on SIDS. SDG 13 (Climate Action) recorded the highest perceived achievement at 97.1%, indicating strong public awareness of environmental risks and the urgency for climate responses. High scores were also observed for SDG 3 (Good Health and Well-Being), SDG 15 (Life on Land), and SDG 4 (Quality Education), reflecting positive perceptions of essential services and ecosystem protection.

Conversely, SDG 5 (Gender Equality) had the lowest level of perceived achievement at 61.3%, highlighting concerns over social vulnerability and unequal access to protection in climate-related crises. Similarly, SDG 10 (Reduced Inequalities) also showed a relatively high level of perceived unachievement (27.6%), suggesting that inclusive and equitable adaptation strategies remain a challenge. These variations illustrate the uneven progress across SDGs and emphasize the need for integrated, context-sensitive, and human-centered climate policies in small island developing states.

Discussion

Climate change in the Maldives, a flat island nation with 80% of its territory at an elevation of ≤1m above sea level, poses a complex and interconnected threat to all aspects of human security. These changes include sea level rise, saltwater intrusion, coastal erosion, ocean warming, and uncertain rainfall throughout the year. This condition not only damages ecosystems such as coral reefs and mangroves (Cerri et al., 2024).

The loss of coastal ecosystems reduces fish catches and decreases the productivity of the fisheries sector, which is a mainstay of the local economy and an important source of protein for communities (N'Guetta et al., 2025). The impacts are felt in economic and health terms, with reduced incomes, increased poverty rates, and malnutrition. Interruptions in freshwater supplies worsen sanitation conditions and increase the risk of waterborne diseases, such as diarrhea. In addition, populations continue to migrate from small islands to urban centers, creating new demographic pressures, infrastructure and social problems.

The human security approach here becomes very relevant, because it emphasizes that climate threats do not only impact the environment, but also affect food security, the economy, health, society, and the community as a whole (Petzold & Scheffran, 2024). For a country like the Maldives, climate threats are not only about island nations but also about individual well-being.

Food security in the Maldives has been under serious pressure due to climate change, which has impacted four dimensions: availability, access, utilization, and stability. Further studies on fisheries have shown that suboptimal management and fluctuations in fishing have threatened local supplies. For example, Abdulla et al. (2024) report recommendations for the development of storage facilities and fisheries infrastructure to improve food security in remote islands. Terrestrial food production is also very limited: only about 21% of the land is available and much of it relies on imported water and fertilizers, which pose risks to alien

species invasion and soil and coral reef degradation. Localities such as Fuvahmulah Island can only grow small-scale horticultural crops, despite their potential for food for local communities. However, species invasion, excessive use of fertilizers, and environmental degradation have worsened the situation, indicating a high dependence on imports (Van Driessche, 2024).

All four dimensions of food security are strongly influenced by climate variability. Changes in rainfall, saltwater intrusion into soil and groundwater, and the intensity of tropical cyclones are damaging local production. Freshwater scarcity further limits the capacity of farmers and hồ farmers, especially during the monsoon. This situation triggers a series of crises if the distribution of imports is disrupted by global conflict, pandemics, or disasters, the Maldivian people will face high nutritional risks, especially on islands with low import capacity. Furthermore, the impact of climate change on fisheries, the decline in fish populations, coupled with ocean warming and coral reef degradation, are causing a sharp decline in animal protein consumption and the idea of sustainable fisheries development (Najeeb et al., 2025).

SDG 13 (Climate Action) can only be achieved if integration with SDG 2 (Zero Hunger) and SDG 6 (Clean Water & Sanitation) is carried out simultaneously. Adaptation alone in the physical sector such as sea walls and infrastructure is not enough without ensuring basic security such as food and water (Filho et al., 2021). For example, adaptation policies in Timor Leste and the Caribbean show that adaptation funds are often allocated to physical projects without mechanisms to protect food and public health. In the context of the Maldives as a SIDS, there are two main challenges, namely the very small island geography and no land reserves, as well as the heavy dependence of the economy on export sectors such as tourism and fisheries and high food import consumption of more than 90 (Nienma et al., 2024). Therefore, a climate adaptation framework based on human security is essential to not only protect physical assets, but also ensure access to food, clean water and basic services for all levels of society.

Adaptation funding needs to be directed towards crisis-resilient food and water systems: funding for food storage facilities, salinity-tolerant irrigation technologies, coral reef and mangrove conservation, and inter-island logistics distribution systems (Tarolli et al., 2024). In addition, policies should strengthen local resilience through capacity building of populations (e.g. farmers, fishers), food diversification such as encouraging the cultivation of traditional crops such as taro and breadfruit, and community empowerment through

citizen science for environmental and climate monitoring (Petzold & Ratter, 2019). Research also shows that international collaborations such as the Indian Ocean climate adaptation workshops build much-needed networks and technology transfer between SIDS countries. This collaboration is essential for implementing best practices in food security and green electricity, as well as access to inclusive adaptation finance.

CONCLUSION AND RECOMMENDATIONS

This study has demonstrated that climate change is not merely an environmental issue for the Maldives, but a multidimensional threat that directly undermines the pillars of human security environmental, food, health, economic, political, community, and individual. Utilizing a human security lens provides a more holistic understanding of how climate change affects SDG 13 and its interlinkages with other critical SDGs such as 2 (Zero Hunger), 3 (Good Health and Well-being), 6 (Clean Water), and 10 (Reduced Inequalities). The survey results highlight strong public concern over environmental degradation, socio-economic vulnerability, and insufficient institutional responses. Key findings reveal that adaptation strategies cannot be isolated in infrastructure development alone, but must be people-centered, inclusive, and context-sensitive.

The novelty of this research lies in mapping SDG achievements through public perception, anchored in the human security framework. The mixed-method approach combining literature review and quantitative survey analysis has validated the hypothesis that international cooperation and community empowerment are vital to climate adaptation in SIDS. By analyzing data across sectors, this study offers policy insights that are both evidence-based and community-informed.

Recommendations:

a. Integrate Human Security in Climate Policies**:** National adaptation strategies should systematically incorporate all dimensions of human security to ensure inclusive climate resilience.
b. Enhance Food and Water Security Infrastructure: Investment in climate-resilient agriculture, water desalination systems, and inter-island logistics is critical.
c. Promote Social Protection for Vulnerable Groups: Social safety nets, especially for women, children, and the elderly, must be strengthened through disaster insurance, universal healthcare, and equitable education access.

d. Foster Global Partnerships: International support through climate finance, knowledge exchange, and technology transfer should prioritize local capacity-building and equity-based development.
e. Encourage Community-Based Adaptation: Local communities must be active participants in designing and implementing adaptation measures, supported by citizen science and inclusive governance.

Future research may explore comparative studies across other SIDS to examine cross-regional best practices. Ultimately, ensuring human security under climate change is not only a policy imperative but a moral responsibility in the path toward achieving a just and sustainable global future.

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