



The Role of Humanitarian Shelter & Settlements Assistance in Promoting Long-term Habitability in Kiribati

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1. Introduction

In the coming decades, the impacts of climate change will increasingly disrupt the lives of millions around the globe. The Pacific and other small island developing states will be among the first to face the consequences from decades of climate inaction (IPCC, 2022). While the humanitarian sector responds to the immediate impacts of rapid-onset climate hazards, there is a pressing need and responsibility to consider how shelter and settlements assistance contributes to an affected population's long-term climate resilience. The Global Shelter Cluster has likewise identified the need to consider the longer-term impacts during humanitarian response (Global Shelter Cluster, 2022). This study examines climate change's effect on habitability in the Pacific atoll nation of Kiribati and the role of shelter and settlements assistance in areas susceptible to repeat and continual climate disasters.

A whole-of-system approach was used to interrogate feedback between physical, social, natural, financial, and human capitals present in disaster-prone communities (Serrat, 2017). Past research has provided evidence of how shelter affects wider impacts such as health and livelihoods (Kelling, 2020; Nabong et al., 2021) and this study explores how indirect effects such as these can contribute to long-term climate resiliency. This study contributes towards the Global Shelter Cluster's strategic priority of evidence-based response (Global Shelter Cluster, 2018) by providing key field data in how climate-affected communities view shelter in the context of wider aspects of habitability. This study thus seeks to inform how humanitarian shelter and settlements assistance can avoid maladaptive practices and increase long-term resiliency.

Main research question

How can the humanitarian shelter and settlements sector contribute to long-term habitability in Kiribati?

Subquestion 1: How can shelter and settlements assistance be used to support wider sectoral aspects of social, financial, and health?

Subquestion 2: What are target humanitarian actions to support long-term habitability?

Subquestion 3: What impacts have past shelter and settlements initiatives had on habitability?

2. Background

The Pacific is susceptible to a number of climate-related hazards that have begun to upend current ways of living. From ocean acidification changing fishing traditional fishing practices to increasingly severe cyclones threatening island infrastructure (IPCC, 2022), islands have been forced to adapt to new ways of surviving. In these small island nations, many question the long-term habitability amongst the myriad of slow and rapid onset hazards (Natano, 2022; Roy, 2019).

Defining Habitability

“We define habitability the environmental conditions in a particular setting that support health human life, productive livelihoods, and sustainable intergenerational development.” [9]

“... ‘habitability’ is culturally and socially experienced and open to multiple truth claims, shaped in part by the discourse of uninhabitability itself.” [10]

National governments, humanitarian organizations, development agencies, and local civil societies work towards facing these challenges, providing relief and investments to support communities. This report examines how these actions, specifically humanitarian shelter and settlements assistance, help to contribute to long-term climate resiliency in the Pacific. Kiribati was selected as a case site location for this study.

2.1. Location

Kiribati is a Pacific Island nation made up of 3 main island groups: the Gilbert Islands, Phoenix Islands, and the Line Islands. These island groups include 32 atolls and 1 raised coral island, 21 of which are inhabited. The ocean area of Kiribati is expansive and covers 3.6 million square kilometres, while the islands’ land area adds up to only 810.5 square kilometres (Republic of Kiribati, 2019).

In 2020, the population of Kiribati was recorded as 119,438 people (Republic of Kiribati, 2021). Nearly 59% of the nation’s population resides on the island of Tarawa, located in the Gilbert Island group and home to the nation’s capital ¹. Increased in-migration to this urban center has presented challenges for resource consumption and land scarcity issues. The population density for South Tarawa is 3,942 people per sq. kilometre, with some areas reaching up to 10,000 people per sq. kilometre, compared to the rural islands where the average population density ~133 people per sq. kilometre². Similarly, the unemployment rate in Tarawa is double (15%) that of average unemployment in rural islands (SPC, 2022).

¹ Calculated from the 2020 Census of Population and Housing’s population data (Republic of Kiribati, 2021)

² Calculated with data from ‘Population density by island’ (Table 5) in Kiribati Census Atlas (SPC, 2022). Rural population density included all islands except North and South Tarawa.



Figure 1 Map of Kiribati³

Especially in urban areas, dense populations lead to health issues through overcrowding and limited water and sanitation infrastructure (SPC, 2022). Poor environmental conditions contribute to high infant and child mortality rate, though has declined in the last few decades⁴. Half of households in the country do engage in activities to grow food and raise livestock for household consumption (SPC, 2022). Soil conditions and land scarcity issues restrict large scale agriculture and have led to a high reliance on imported food supplies.

2.2. Climate Hazards

Due to the geographical characteristics of atolls and limited infrastructure capacity, islands in Kiribati are particularly susceptible to the effects of climate change. In Kiribati, the elevation of atolls are no more than 2 to 3 meters high (Republic of Kiribati, 2019).



Figure 2 Elevation marker in South Tarawa

The following list of climate hazards are adapted from the Kiribati Joint Implementation Plan's (KJIP) tables of observed and project trends for climate variability in the country and supplemented with additional information from other relevant sources (Connell, 2018; IPCC, 2022, 2019; Republic of Kiribati, 2019). This list is not exhaustive but selected to highlight key hazards affecting shelter and settlements.

³ Map sourced from <https://www.mapsland.com/oceania/kiribati/political-map-of-kiribati>

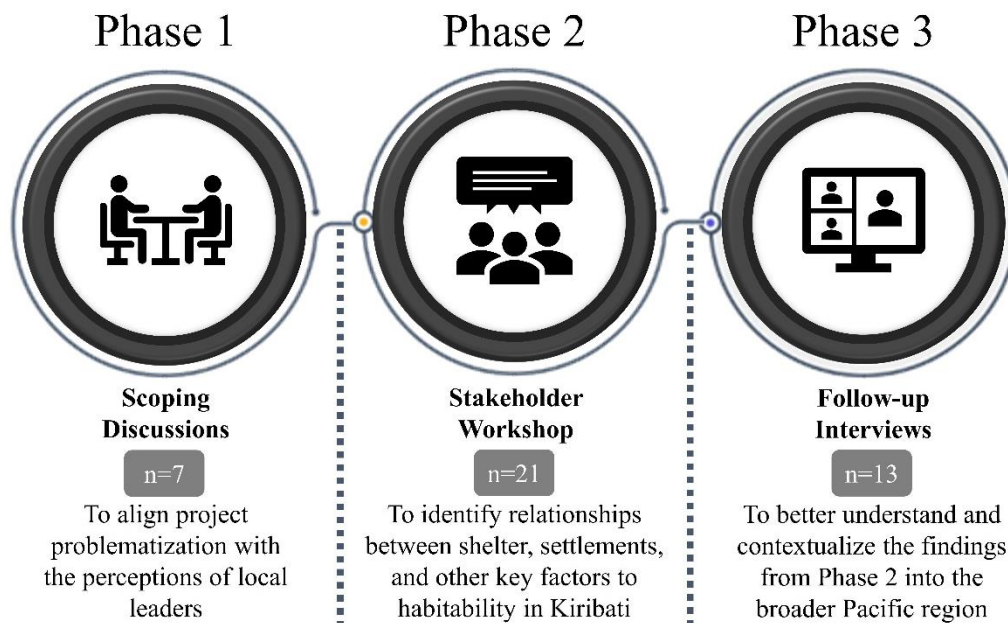
⁴ Statistic from the Institute for Health Metrics and Evaluation (2022). <https://www.healthdata.org/research-analysis/health-by-location/profiles/kiribati> (accessed 1.6.24)

Table 1 Climate hazards in Kiribati and impact on shelter and HLP

Climate Hazard	Observed and Project Trends	Impact on Shelter and HLP
Sea level rise	<p>Global mean sea level rise is estimated at 3.6 mm/ year and rising. Regional variations in sea level rise have shown that areas in the Pacific may be rising faster than the global average. Stemming from increased sea level rise, Kiribati has faced increased challenges with coastal erosion, saltwater intrusion, and flooding.</p>	<p><i>Erosion</i> – Erosion from sea level rise, exacerbated by sand mining and dredging, has caused land loss in coastal areas of the country. Loss of land has led to property disputes as households relocate inland.</p> <p><i>Saltwater intrusion</i> – Sea level rise as led to saltwater intrusion of groundwater in some places. In combination with over pumping, saltwater intrusion has led to contamination of the shallow freshwater lens leading to water insecurity challenges for households, seen especially in Tarawa.</p> <p><i>King tide</i> – King tide is a monthly occurrence in Kiribati where the islands experience exceptional hightide. This and other flood events have become more severe with rising water levels causing damage to housing and other household assets. There is similar recurring damage to roads, utilities, and community buildings.</p>
Cyclones	<p>Cyclones are rare in Kiribati though changing weather patterns may bring severe storms closer to the islands.</p>	<p>Though rare, peripheral effects of nearby cyclones have still been damaging. In 2015, heavy winds, storm surge, and flooding from Cyclone Pam caused extensive damage in Kiribati. In this case, cyclone effects were compounded by the monthly king tide.</p>
Drought	<p>Drought trends in the Pacific due to climate change are unclear. Historically Kiribati has experienced periods of severe drought. During El Niño events, drought conditions cause severe water shortages.</p>	<p>Drought, in addition to water quality issues from saltwater intrusion, causes water insecurity for much of Kiribati. Shelter design has begun to incorporate rainwater harvesting equipment but cannot provide continued water security during periods of drought.</p>

3. Methods

The findings of this project were informed by data collection conducted by the lead author between September – December 2023. The data collection methodologies included (1) scoping discussions (2) a workshop and (3) follow-up interviews with I-Kiribati leaders and regional practitioners and academics.



Phase 1 and 3 of the project were conducted in English and Phase 2 (Stakeholder Workshop) was facilitated in a mixture of English and I-Kiribati with the assistance of a translator and group facilitators. All data collection in Kiribati was done in South Tarawa, Kiribati. As the contexts between South Tarawa and outer islands in Kiribati differ considerably, it is important to note that most discussions reflect the experiences and perceptions of individuals living in South Tarawa.

3.1. Scoping Discussions

The purpose of the scoping discussions was to ensure conceptual alignment of the identified problem between the project team and I-Kiribati local leaders. Individuals were selected for discussion because of their expertise in climate change impacts in Kiribati, both through lived experience with climate hazards in Kiribati and their leadership in local climate initiatives. The scoping discussions were centered around the idea of understanding the key factors that are important, and perceived as necessary, for maintaining habitability in Kiribati.

The discussants were provided a list of 18 potential factors of habitability which were previously compiled from a global study synthesizing reasons why people have decided to move in relation to climate change (Nabong et al., 2023). The factor list and definitions provided can be found in Appendix A. Discussants were asked to consider the relevancy of each factor to Kiribati and rank

the top 5 most important factors they feel are needed to maintain a habitable living environment. The top factors of habitability were then calculated using the rank of each selected factor.

3.2. Stakeholder Workshop

To understand how shelter can be used to promote long-term habitability, it was necessary to take a holistic and multi-sectoral systems approach. Using the ranked factors from Phase 1, a workshop was held to identify causal consequences from both climate impacts and potential humanitarian action. The workshop brought together local leaders in Tarawa, Kiribati who were interested in participating on the topic of climate change adaptation and resiliency. This included members of local climate NGOs, church groups, youth activist groups and other civil society groups. During the workshop, participants were asked to discuss pairs of factors to agree on the polarity and strength of each relationship, following the three steps described in the Workshop discussion steps (shown to the right).

Following the completion of all pairs of factors, preliminary results on the feedback loops were shown and discussed as a group. Group validation of the preliminary results explored the applicability of the findings for Kiribati.

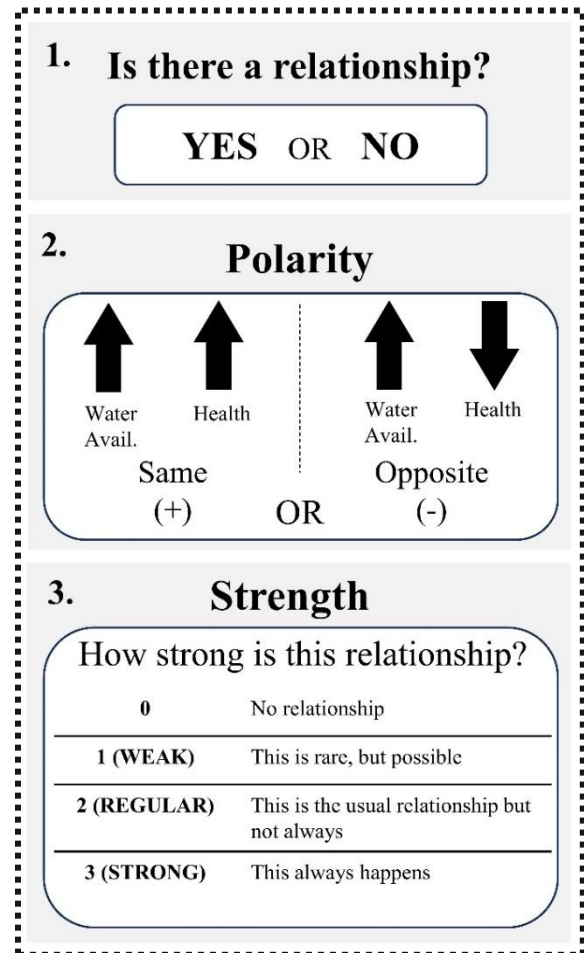


Figure 3 Workshop discussion steps

3.3. Regional Contextualization

Interviews were then conducted to ground the findings of the workshop in real-world examples, as well as provide context to the transferability of the findings to other countries in the Pacific.

The lead author conducted interviews with 6 I-Kiribati climate experts, 3 of which also participated in the workshop. The purpose of these follow-up discussions were to more deeply explore the issues and themes that were identified during the workshop and how they align with past examples of humanitarian shelter assistance in Kiribati. The lead author also conducted interviews with 7 humanitarian practitioners and academics who have work and/or research experience in the Pacific. These interviews provided supplemental insights into the role of humanitarian assistance in the Pacific and the relevancy of issues and insights drawn in Kiribati to other regional contexts in the Pacific.

4. Findings

The following sections provide details for the results of this project and how they can be used to improve humanitarian shelter and settlements assistance towards the goals of promoting long-term habitability for climate-impacted island states in the Pacific.

4.1. Priorities for Long-term Habitability

When discussants in Phase 1 were asked to rank the factors that they perceive as the most necessary for maintaining habitability in Kiribati, *Land* was found to have the highest importance. In these conversations, *Land* was viewed as the physical space on which people settle while also holding significant meaning culturally. In Kiribati, as well as many other places in the Pacific and around the world, attachment to the land is deeply woven into culture and society (Constable, 2017; Kelman et al., 2019; Morrissey, 2013). Many participants of the project have expressed reluctance to leave their [home] lands in the context of climate change, saying they would rather stay and die in Kiribati than leave. Retaining the lands that have been passed down has become difficult, however, even for those who remain in Kiribati. Erosion and recurring tidal surges have cut into people's lands and water scarcity issues, in some cases, require movement to places with better water security. This is used as a last resort option, however. Even with high water insecurity many families choose to stay for fear of land grabs. Others may move seasonally to more water secure areas while leaving some family members behind to hold their lands. One I-Kiribati discussant summarized this choice between water and land preservation as,

“Water is short-term and [lack of water] hurts individuals, land is generational.”

Resource availability, specifically in the form of water security, was the second highest rated priority for maintaining long-term habitability in Kiribati. Impacts of climate change, such as drought and salinization, have created water security issues in Kiribati, especially in southern islands. In Tarawa, population pressures as well as climate change, have strained resources past sustainable consumption levels. Ensuring reliable access to good quality water was a high priority for habitability for discussants in Phase 1.

While it is important to evaluate the factors that discussants selected as high priorities for habitability, it is also insightful to reflect on the options that did not receive any ranking votes for importance. Notably, of the 18 factors presented for consideration *Shelter* was not selected as a top 5 habitability priority by any of the Phase 1 discussants. One discussant explained the omission by again highlighting the importance of *Land*, saying that houses can be rebuilt but land cannot. This omission is also reflected in a noted lack of shelter projects within humanitarian assistance in the Pacific. One practitioner shared that shelter *is* a priority but as they take their assistance cues from

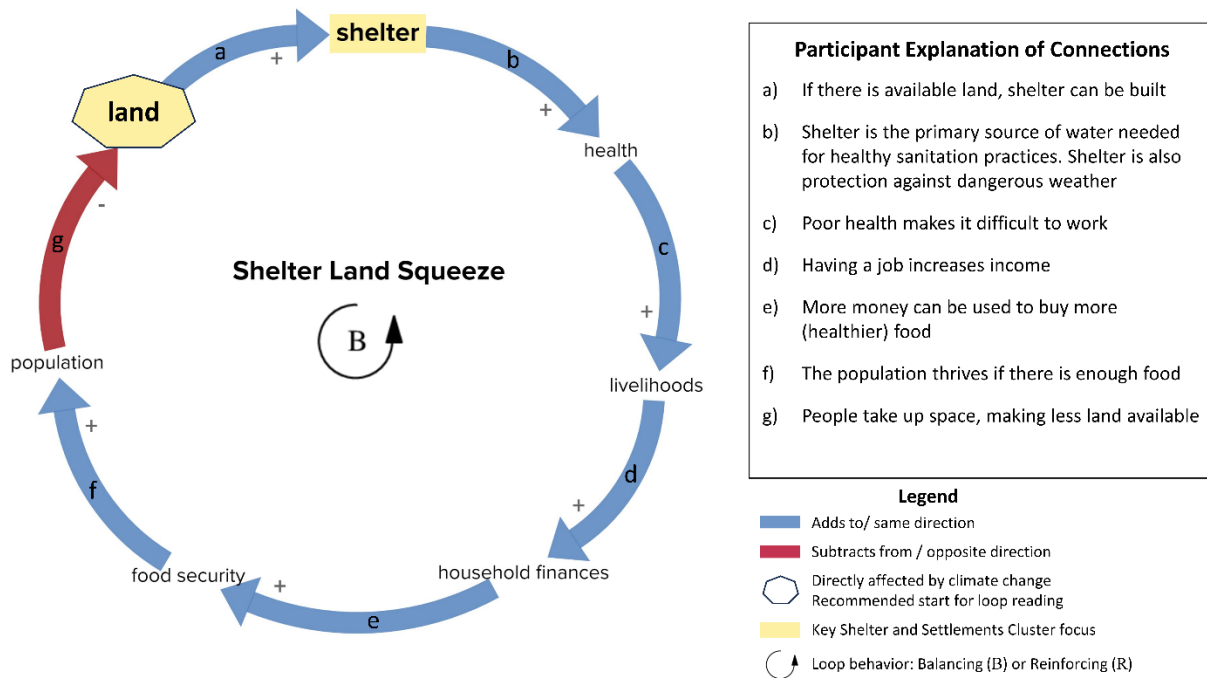
partner governments, the lack of shelter projects stems from national governments in the Pacific asking for assistance in other areas of need.

4.2. Wider Impacts of Shelter and Housing, Land, and Property

Although *Shelter* was not ranked as a top 5 priority for habitability by discussants in Kiribati, it is undoubtedly a critical aspect in people’s ability to live safely, securely, and with dignity. Humanitarian shelter assistance not only helps to improve families’ physical housing but also help to provide security in a variety of other dimensions. Similarly, humanitarian assistance through settlements and HLP programs also improve other facets of living, such as water sourcing or community building, through more secure tenure. In this section, the wider impacts of humanitarian assistance through shelter and settlements programming is discussed through the lens of systems thinking. The following sections examine shelter and settlements-related feedback loops where all connections between factors were identified and described by participants during the workshop in Phase 2. These four feedback loops are not exhaustive but highlight issues and points highlighted by discussants.

Shelter Land Squeeze

One of the top issues that was discussed was that of overcrowding and how increasing population is creating pressures on land availability and resources⁵. This is additionally exacerbated by climate impacts, such as erosion and tidal surges which contribute to land loss.



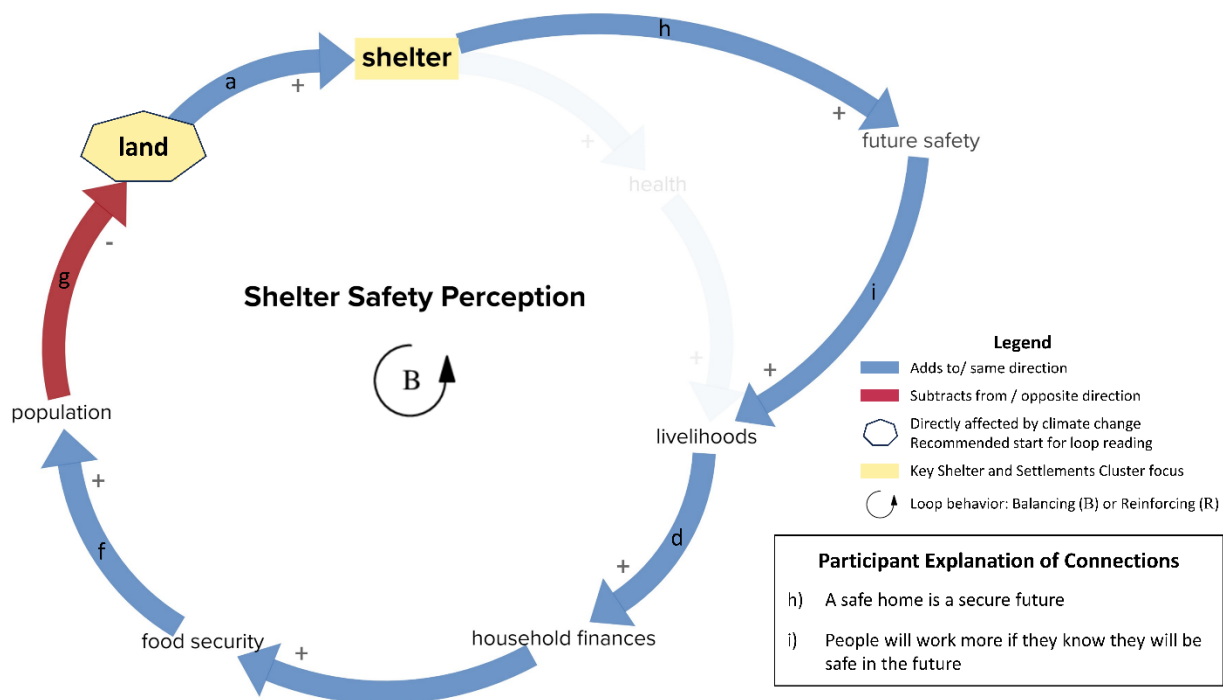
Feedback loop 1: Shelter Land Squeeze

⁵ This point reflects a major issue in Tarawa, Kiribati but does not necessarily represent other islands in the country.

The reading of the feedback loop can begin anywhere, but it is useful to start with the direct impact of an external factor (such as climate change) to see determine how the relationships unfold in the loop. From this starting point, the story of this loop shows that as climate impacts lead to *Land* loss, there is less land available to build *Shelter*. Without shelter, people’s *Health* suffers leading to the potential for loss of ability to engage in *Livelihoods*. If people are unable to engage in livelihood activities their *Household finances* decrease and make it more difficult to consistently pay for food [*Food (in)security*]. Over the long-term a lack of accessible food will lead to a decrease in population size which in turn lessens the demand for land and shifts the cycle into a cascade of advantageous consequences until the population grows enough to again put pressures on land availability. This cyclical behavior creates a balancing loop. In summary, this loop shows that improved living conditions eventually affect land availability. For humanitarian practitioners, this points towards the need to consider HLP and land availability in parallel to other assistance initiatives.

Shelter Safety Perception

Another loop that was identified by workshop participants is shown in Feedback loop 2. This balancing feedback loop is similar to the Shelter Land Squeeze, where loss of *Land* will have detrimental effects until it eventually leads to *Population* loss and the cycle impacts flip. The only difference between these two is that this loop shows *Future safety* as another direct causal effect of *Shelter*, in the place of *Health*.



Feedback loop 2: Shelter Safety Perception

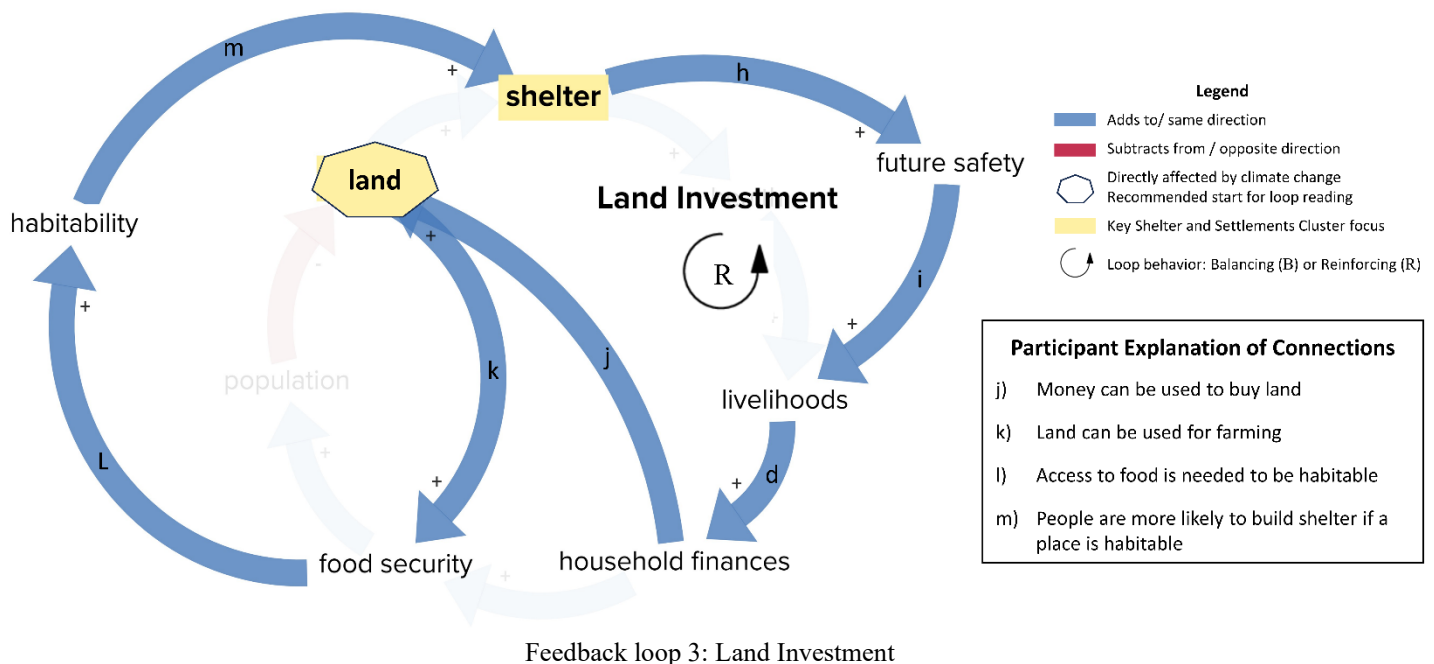
While the tangible benefits of shelter are often noted, it is easy to overlook the non-tangible benefits that safe and secure shelter provide. From the view of the workshop participants, shelter

not only provides essential space and utilities to maintain physical security and health, but also contribute to feelings that their families will be safe and secure in the future. This idea of future security for future generations leads to further investment in their lives in Kiribati, while an uncertain future may lead to lack of investment or exploration of options to leave.

It is important to note that while the varying direct impacts of shelter create multiple loops, both loops have to potential to exist together. In a situation where there is a shortage of available shelter, both degradation of health and perceptions of future safety can combine to lead to a loss of livelihoods through physical and/or mental inability [*Health*] to engage and/or an unwillingness to put effort into work when there isn't perceived to be an option for a long-term future [*Future Safety*]. Indeed, the idea of future safety and health themselves are intrinsically linked where deteriorating perceptions of future safety in their home country can have deleterious effects on a person's mental health.

Land Investment

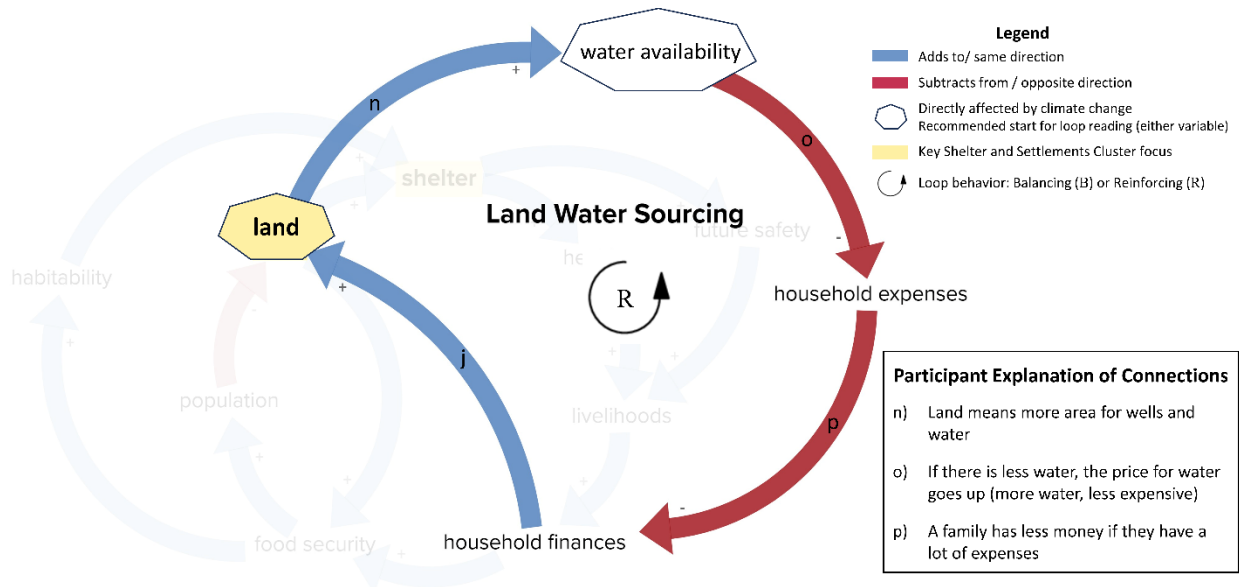
In another example of an identified feedback loop, Feedback loop 3 shows how investments in *Land*, and lack of, can create reinforcing behavior. Let's begin again with the effect on climate change on land. As land is lost, there is less available space for growing food. Additionally, saltwater intrusion and salinization of soil have also contributed to the inability to produce locally grown food in Kiribati. With the inability to grow food, participants indicated that *Habitability* would decrease. In these discussions, habitability was defined as "the quality of a place being fit to live in." As the ability to live in a place decreases, participants stated that they would be less likely to build new shelter. The loop continues similarly to the previous two where lack of shelter contributes to uncertainty regarding future safety, potentially leading to a disengagement in livelihoods and reduction in household finances. As land is at a premium in Tarawa, the state of household finances determines the ability to purchase new lands or invest and maintain existing



ancestral lands. This loop shows the potential for a spiral vicious cycle if there is no action. In Section 5, recommendations are proposed on points to intervene.

Land Water Sourcing

The last feedback loop to be highlighted here touches on the two main factors of habitability identified by discussants in Phase 1, *Water Availability* and *Land*, both of which are impacted by climate change. As either of these two factors decrease, a vicious reinforcing loop emerges.



Feedback loop 4: Land Water Sourcing

As mentioned in previous loops sea level rise negatively affects the amount of land available. Similarly, in Tarawa, Kiribati sea level rise has also been affecting already-strained water resources through salinization of the freshwater lens.

The story that participants have shared through this loop shows that as water becomes scarcer the cost increases, likewise increasing household expenses. As household expenses increases, it subtracts from the overall household finances. As household finances are used to meet daily needs, such as water, over the long-term households are unable to invest in expanding their property. If a household does already have large amounts of land their potential sources for water expand and shift this reinforcing loop to a virtuous cycle.

From the country’s National Integrated Vulnerability Assessment Database surveyed participants shared their perceptions on changes to water supply saying, “[Before,] Freshwater was found all throughout the land. Drought was not very common” while now “Very hot temperature making some areas (40% of the area at our village) is now being affected by water salinity”.⁶

⁶ Quotes from the Kiribati Integrated Vulnerability Assessment Database. Publically available quotes are taken from surveyed participant(s) from Tabiteua North (found at <https://www.kivadb.net/iva-1-percieved-changes.html>)

In periods of water-related crises, such as drought, two options were shared as ways families can cope if they are not able to access water through the lands. First, the family may look to social connections for help in meeting their needs. Many families share that in times of drought they receive water from their church. In such crises, it is important for humanitarian practitioners to recognize and support existing social networks for efficient delivery of assistance. Secondly, in extreme cases of water insecurity families may move to areas with more reliable access to water resources. Humanitarian assistance may be needed to support families in this transition through shelter or mediation of land rights.

5. Recommendations

The feedback loops in the previous section have limitations in that they primarily reflect experiences in Tarawa, Kiribati as well as omit a number of other factors that could potentially also affect the loops. These omissions were due to the limitations of discussion time and the subsequent choice to focus on key important aspects (as identified in Phase 1). As such, the feedback loops are shown as stepping stones toward discussion and not necessarily a complete encapsulation of reality. Recommendations for humanitarian assistance are proposed below to help achieve long-term habitability in the face of climate change, based on the previously discussed feedback loops.

The following proposed recommendations were developed through workshop discussions with participants in Phase 2 as well as through insights following follow-up interviews with regional practitioners in Phase 3.

5.1. Pre-Disaster Mitigation

In the coming years and decades, countries in the Pacific will experience a variety of both rapid and slow climate-related hazards. Atoll nations, such as Kiribati, are especially vulnerable to slow onset climate hazards such as sea level rise and salinization due to their low elevation. As shown in the feedback loops in Section 4.2, these hazards can trigger harmful feedback cycles. In many cases, the progression of slow onset hazards can cause a long recovery or irreversible damage, such as when a freshwater lens becomes inundated with salt water. As such, there is a pressing need for an increased focus on proactive disaster risk management, rather than reactive disaster response. As one humanitarian practitioner shared,

*“It's too late to help if you wait until after the
[slow onset] disaster.”*

In the example of saltwater intrusion, pre-disaster humanitarian programs at the settlements scale could include water management planning to protect the freshwater lens from overconsumption and prevent disastrous complete inundation. While proactive disaster risk management of slow

onset hazards is critical towards stemming potentially irreparable harm, the need for preventative disaster management is important for rapid onset hazards as well. In the case of increasing king tides, land use planning can help lessen disaster risk by avoiding housing exposure to dangerous tidal areas.

Collaboration opportunities with national government

As the impacts of climate change increase, the burden of adaptation and resiliency building will be borne mostly by local and national governments. As consistent actors in a country, governments are well positioned to bridge the gap between humanitarian assistance and long-term development needs responding to climate impacts. In both examples mentioned above, water management planning and land use planning, a partnership between humanitarian practitioner teams and the national government would lead to fruitful outcomes.

Water management planning

As groundwater in coastal areas becomes more salinized many households will need to look for other water access points. In Tarawa, there have already been strides towards centralized water distribution in some areas but not yet complete reach to all. With the completion of proposed desalination plants, South Tarawa will be able to supply 6,000 m³ more water per day and greatly improve water security in Tarawa (ADB, 2020). This initiative is a significant step towards expanding water security for those who may not have reliable access or supply through land ownership. Feedback loop 4 (Land Water Sourcing) shows that at the current state, workshop participants perceive land ownership as important for water security with the idea that water is supplied from groundwater sources on one's land. A collaboration between humanitarian practitioners and the national government could continue to prevent future water insecurity disasters by decoupling water access from land ownership. It is further recommended to extend water utility access to households living in informal settlements. One discussant shared that health issues are common in informal settlements because of the inability to access clean and safe water.

Land use planning

As sea level rise slowly encroaches into coastal zones and pushes some families farther inland, violent land disputes have been reported (UNHRC, 2020). At a household scale, clear property delineations would help humanitarian practitioners assist in boundary disputes and prevent occurrences of land grabs as families move temporarily or seasonally for resources. At a settlements scale, the development of a comprehensive land use plan and hazard mapping would help to identify areas at risk of hazards as well as assist in resource planning. Hazard risk identification is important for both disaster preparedness initiatives in high-risk areas, as well as locating less hazard exposes places for people to move to.

Adapting Shelter Infrastructure to a Change Climate

As pre-disaster mitigation strategies, the following recommendations are made for constructing climate-resilient shelters. These recommendations can also be used as considerations for post-disaster recovery programs, in line with the concept of Build Back Better and Strategy 6.1 of the Kiribati Joint Implement Plan (KJIP).

1. Household rainwater catchments

Water security has been raised as a main issue for Tarawa and is likewise a problem for many low elevation atolls. A top housing priority for discussants was the implementation of household rainwater catchment systems. While centralized water distribution is available for some parts of Tarawa, there are still complaints of water quality issues. Inaccessibility is also an issue for those in informal settlements. Rainwater harvesting has been suggested by local discussants as a reliable way of achieving water security. This strategy would help to alleviate the strain of water consumption from the freshwater lens.

In practice, the national government of Kiribati has had initiatives to install community water catchment equipment. One government official shared that many of these systems have fallen into disrepair due to lack of maintenance. From this experience, the discussant recommended catchment systems be supplied at a household level to assign direct responsibility of ownership and maintenance. One consideration with household level rainwater harvesting systems is that traditional I-Kiribati housing structure's use of thatch roofs are not conducive towards rainwater collection. Care should be taken in not forwarding impervious roof material for the use of rainwater harvesting at the expense of traditional housing. In a separate example, the Kiribati Red Cross Society *has* seen success with community water systems but emphasize that community engagement and capacity building is key to group sharing of responsibilities. Regardless of the harvesting scale, the point was clear that shelter planning needs to incorporate reliable access to safe quality water.

2. Elevated housing

Another concern expressed by participants is the increasing frequency and height of king tides in Kiribati. One discussant shared her worry for the safety of her children, fearing that the tides may come to sweep them away. Other discussants described the helplessness felt when tides enter people's houses, explaining that there's nothing a family can do but wait for the water to recede and wait for its return.

A flood mitigation strategy, recommended by one discussant, was for new constructions to be elevated above potential flooding. This recommendation calls back to local traditional knowledge on flood resiliency. In Kiribati, as well as many other Pacific countries, the approach of elevated flooring is already incorporated in traditional housing design. This design, along with other elements of traditional housing design, was recommended in a project to design climate responsive housing in the Pacific (Rockwood et al., 2015).

3. Build up, not out

In Feedback loops 1 and 2 the connections, based on participants' views on the current state of Kiribati, show how increases in population leads to a decrease in future land availability. This squeeze on land then triggers a cycle of negative effects until the population-land pressure releases. A recommendation to lessen the impact of population growth on land use is to decrease the footprint of new infrastructure through multi-story houses and buildings.

The Maldives, another atoll nation, has similarly struggled with growing population pressures. In Hulhumalé, an island built entirely on reclaimed land, the government-owned Housing Development Corporation has constructed multi-story public housing units to meet the growing demands of a rapidly expanding population (Werber, 2020). While this strategy has proven useful in providing sheer numbers of housing units, practitioners should be mindful of the local and cultural needs and preferences. In a survey of residents from public housing in Hulhumalé, researchers have found the majority of residents are only 'slightly satisfied' with the new public housing (Mohit and Azim, 2012).

5.2. Managed Retreat

There is a strong preference among the national government and I-Kiribati citizens to remain in their homes, however in the absence of sufficient climate mitigation efforts it may become necessary to relocate. There has yet to be a triggering event to spur a large-scale displacement, however there may be tipping points within prolonged climate disasters, such as water insecurity crises, after which action from the humanitarian community may be warranted. Managed retreat may involve movement to another location on the same island, to another island within Kiribati, or even international movement.

Current Status of Internal Migration

There is already a strong history of movement in Pacific Island contexts. In Kiribati, movement has been especially acute from residents of outer islands moving to South Tarawa, where the capital is located. Between 2010 and 2020, South Tarawa experienced rapid urbanization with an 83% increase in population¹. Discussants have shared that this massive influx of residents have put a strain on resources, namely land and water. They stated that some migrants are motivated by climate impacts in the outer islands, with some islands regularly facing drought and brackish water supplies. Most, however, they say come for the opportunities that are more readily available in Tarawa. Higher quality schooling, access to hospitals, and livelihood options are some of the reasons that the workshop and interview discussant say drive this in-migration.

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In the feedback loops developed, the growing population in Tarawa causes a shortage of available land. The participants explained that this relationship is different in the outer islands, where there is ample land available but limited social services to retain residents.

They suggested that investment into the development of outer islands would have the dual benefit of providing important services to outer island communities thereby lessening the need to migrate to Tarawa to receive schools, healthcare, etc., while also alleviating some of the population pressures of the arrivals. One humanitarian practitioner cautioned though that the decisions to leave or stay show happen organically and not out of compulsion.

In anticipation for such a future, the national government of Kiribati has begun the development of Kiritimati Island (ADB, 2010; Pacific Community, 2017) as well as purchased 22 square kilometres of land in Fiji (Pala, 2021). In 2009, the government of Kiribati received a technical assistance loan from the Asian Development Bank with the intention of developing a “strategic plan for voluntary resettlement from South Tarawa to Kiritimati Island” (ADB, 2009). Since that time, other projects have worked towards energy and water supply for the island (Pacific Community, 2017). Project discussants have shared, however, that although Kiritimati Island is an option there is reluctance of people to move away from the ancestral lands in Tarawa. This point implies that migrants to Tarawa have similar hesitations for leaving their lands and if presented with more opportunities at home, may choose to stay.

Housing, Land, and Property in Managed Retreat

Housing, Land, and Property (HLP) has major cultural significance in Kiribati. Land is often passed down through generations and hold deep meaning for families. When providing humanitarian assistance through managed retreat, it is important to simultaneously consider the legal ramifications for both the destination locations as well as the places being left. Examples of how the shelter and settlements cluster could assist in this regard include:

1. **Contract Assistance** – This may be useful for occasions of rentals or land purchases in the context of managed retreat. Humanitarian practitioners may provide legal assistance to involved parties to ensure that everyone’s rights are respected and protected. Even within families there can be disagreements on property allocations which clear contracts can help to alleviate. Contracts and title assistance may also be a useful safeguard to assure landowners that their ancestral lands will not be stolen, whether or not they are inhabited or inhabitable. This may also become relevant in discussions of climate change loss and damage.

2. **Dispute Mediation** – In instances where there is a disagreement, mediation is a tool that humanitarians can use to resolve land disputes.

3. **Tenure Security** – When leading managed retreat efforts it’s important to consider the tenure of security for the destination location, both from evictions as well future forced displacement from climate hazards. To this end, humanitarian practitioners should ensure that destination locations are not in highly hazard exposed areas. This recommendation is related to the suggested collaboration on land use planning in *Collaboration opportunities with national government*.

6. Future for Kiribati

In regard to the human right to adequate housing and secure tenure, in the context of Pacific countries, it may become necessary to consider how households’ security of tenure is threatened by climate change and the responsibilities to address these threats. These physical threats to security of tenure are also often compounded by psychological harm, as shown in Section 4.2, where participants shared concerns for their future safety while living in Kiribati. The forecast of climate impacts is daunting for Kiribati and other Pacific countries. There are severe challenges, such as water insecurity, could be determining factors for future habitability. With those challenges, however, there are many opportunities for humanitarian and development assistance to maintain habitability and support households as they adapt to climate change.

Key Recommendations

- Identify and support existing social infrastructure in disaster response
- Consider future land availability and Housing, Land, and Property (HLP) in tandem with any humanitarian assistance
- Increase focus on pre-disaster mitigation
- Support climate-affected groups in managed retreat with the recognition that leaving home is considered a last resort

This study highlights land tensions and water security as two of the main issues affecting shelter and HLP in Kiribati. Using participatory methodology and systems thinking, recommendations have been proposed to identify humanitarian assistance strategies that could be used to maintain habitability in an increasingly climate-affected country. Feedback analysis, as used in this study, is a useful way to think long-term and evaluate an issue holistically to help avoid potentially maladaptive assistance.

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Appendix A – Factor List and Definitions

	<p>Aid programs Programs that offer monetary or in-kind assistance Ex. livelihoods, shelter</p>		<p>Physical infrastructure (community) Community buildings (hospitals, schools), roads, utilities</p>
	<p>Assets Physical things that are owned and worth money Ex. vehicles, livestock, equipment</p>		<p>Physical infrastructure (homes) Family houses and residences 'Shelter'</p>
	<p>Community Family, friends, neighbours, and other social networks Note: also referred to as 'Population' based on the interpretation of participants in Phase 2</p>		<p>Attachment to Kiribati Emotional ties to the land, culture, or society Note: also referred to as 'Land' and expanded to include physical spaces</p>
	<p>Cost of living Cost of rent/housing, regular food costs, etc. 'Household expenses'</p>		<p>Political stability Stable political system, lack of conflict (between citizen or citizens and the government)</p>
	<p>Security Lack of unlawful activity Ex. no theft, drugs, exploitation, murder</p>		<p>Remittances Money sent to you from overseas</p>
	<p>Environmental degradation Air, Soil, or water quality getting worse</p>		<p>Resource availability Availability of natural resources needed for living such as water, wood, clean air Note: later specified to 'Water Security'</p>
	<p>Food security Access to and availability of food to maintain health</p>		<p>Safety perception for future Idea that Kiribati will be liveable for many generations 'Future Safety'</p>
	<p>Health Physical and mental health</p>		<p>Social equality Even distribution of resources in society</p>
	<p>Livelihoods Income-generating activities; jobs</p>		<p>Social services Health services (healthcare and sanitation), education services, community amenities</p>

Appendix B – Factor Rankings

Participants were asked to rank the top 5 factors they perceive as being necessary for habitability in Kiribati. Factors were then scored with 5 for Rank 1 choices, 4 for Rank 2, 3 for Rank 3, 2 for Rank 4, 1 for Rank 5 choices, and 0 for unselected choices. The scores below are for the 7 participants from Phase 1.

RANK	FACTOR	SCORE
1	Place Attachment (land tenure)	16
2	Resource Availability	15
3	Environmental Degradation	14
4	Transport (road, wharf)	13
5	Social Services	12
6	Food Security	8
7	Cost of Living	7
8	Community	6
9	Utilities (energy, telecommunications)	3
10	Future Safety	3
11	Livelihoods	3
12	Remittances	3
13	Health	2
-	Aid Programs	0
-	Assets	0
-	Security	0
-	Physical Infrastructure (shelter)	0
-	Political Stability	0
-	Social Equality	0