

The **Community Resilience Case Studies** explore and document insights about changes in community resilience to climate change and disasters. Case studies were undertaken in Fiji, Kiribati, and Timor Leste.



**Australia Pacific  
Climate Partnership**

## Case study 2 | Community resilience in Betio, South Tarawa, Kiribati

This case study focuses on Betio community in South Tarawa, Kiribati. Kiribati is highly exposed to the risks and impacts of climate change. Increased prevalence of heat waves and drought, intensified storms and cyclones, erosion, saline intrusion and wave-driven flooding were described by Betio research participants as already posing immediate threats to their lives and livelihoods.

Betio is a densely populated small island at the western end of South Tarawa. As it is the location of Kiribati's main port, Betio's potential for employment opportunities drives high levels of migration from outer islands, as it has done since the early 1900s. Severe overcrowding, combined with the immediate impacts of climate change, contribute to acute food and water insecurity, which are major and immediate challenges for the Betio community.

People in Betio are responding to climate risks and disaster impacts in a variety of ways. However, given the challenging environment, evidence of transformational change was limited. Due to limited long-term adaptation options, most actions reported by the community tended to focus on absorbing shocks and coping with immediate impacts. However people were planting trees to reduce heat stress, safeguarding local infrastructure using short-term traditional and modern methods, and building financial security through livelihood diversification. Community members were also working with Live and Learn Kiribati to adopt climate-smart agriculture technologies to improve their food security through the Atoll Food Futures (AFF) project.

The Betio case study highlights that residents are taking action on climate change through adaptive and innovative measures that harness cultural practices of collaboration and sharing. However, the immediate and long term impacts of climate change require extended and continuing external support to address urgent food and water security challenges. Support to develop longer term viable adaptation options are also critical for the people of Betio.



*A farmer with Live and Learn's Atoll Food Futures project stands beside his Foodcubes in Betio, South Tarawa [Photo credit: Jessie Meaney-Davis, UTS-ISF]*

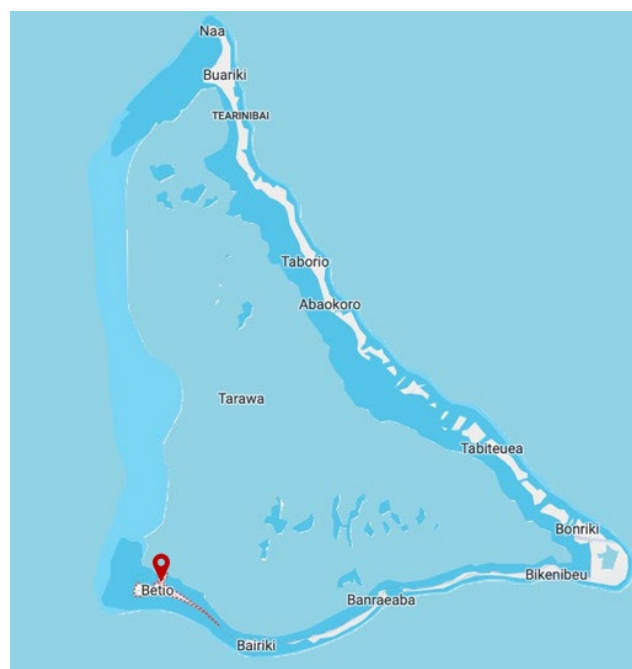
### Community context

Betio is an urban island settlement in the western part of South Tarawa. Betio is the most densely populated part of Kiribati, with approximately 15,000 inhabitants per square kilometre (two and a half times the population density of Tokyo).

The port in Betio operates and the main port of entry for all imports to Kiribati. Since the 1900s, people from outer islands have come to work on cargo ships operating from the port, and these workers later settled in Betio, spurring the ongoing process of i-Kiribati people migrating from the outer islands, abandoning subsistence lifestyles and pursuing economic opportunities in the urban centre.

As with other parts of Kiribati, religion is an important part of life for people in Betio, with Catholic and Protestant the dominant Christian denominations.

The ongoing impacts of rapid and continuing urbanisation, including overcrowding, poor sanitation, loss of trees and land, and pollution in Betio are well documented and acknowledged by the Government of Kiribati.



*Figure 1: Map of Tarawa, Kiribati, noting the location of Betio in the western part of South Tarawa (Source: Google Maps).*

## Climate impacts

Betio community members described experiencing climate change, disaster risks and impacts over the last 20 years. Experiences described by community members include:

**Increased land and ocean temperatures and unpredictable rainfall** are making it increasingly difficult for people in Betio to grow food, sustain water supplies, and catch fish for consumption and sale. Heatwaves made working outside a major challenge. Older people, men and people with disabilities particularly emphasised the impact of increased heat on their health and wellbeing.

*With increasing high temperatures, ground water is getting harder to find, most [wells] are usually saline. Therefore, our livelihoods and farming activities are restricted.*

- Woman from Betio

**Increased storm intensity** is causing flooding, which in turn affects water (particularly the freshwater lens), sanitation and hygiene. Three participants mentioned the roofs of homes being blown away and having to be repaired or rebuilt.

**King tides, coupled with increased storm intensity and sea level rise, is contributing to coastal inundation and erosion**, damaging infrastructure including homes and roads, and people repeatedly construct *bwibwi* (traditional temporary coastal barriers made from natural materials (e.g. sticks) designed to catch debris to build up a natural sea wall) or walls made of sandbags to protect their homes from sea inundation during king tides.

*Shoreline erosion occurs especially at high tides. The impact is greatest now. It comes up into peoples' homes and affects our daily lives.*

- Man from Betio



Foodcubes and bags of leaves for compost (left) used to grow fruit and vegetables in a place that would otherwise be too salty to grow food in. (Photo credit: Jessie Meaney-Davis).

**The effects of climate change are significantly exacerbated by overcrowding and rapid urbanisation of Betio** – the most commonly cited barrier to climate resilience mentioned by research participants. For example, overcrowding intensifies the effects of heat waves and makes it difficult to find space to cool down, and increasing demand for land and materials for construction has intensified coastal erosion and reliance on imported food instead of growing fruit and vegetables. A growing population also puts a strain on already stretched water and sanitation systems.

*Our farms and garden do not grow with well-water therefore we can only use rainwater. But our family needs rainwater as it is the only fresh and free water we can consume. We have to make daily water sacrifices between watering crops or hydrating ourselves.*

- Youth from Betio

## Community adaptation and resilience

People in Betio have been responding to climate risks and disaster impacts in a variety of ways. However, evidence of transformational change was limited, given the challenging environment. Most actions reported by the community were to absorb shocks and cope with immediate impacts. The following examples describe action taken by the community in response to climate related impacts and challenges.

### **Nature-based solutions were used to manage heat stress.**

Women in Betio have started implementing nature-based solutions for climate change adaptation. Women described how they were planting trees and grass to cool their homes and improve soil and water quality, and two people with disabilities described planting mangroves to reduce erosion and the impacts of storms and king tides. Older women described how tree species were selected based on their ability to provide shade and fruit, e.g. breadfruit trees, so they could consume or sell the fruits.

*We plant trees to reduce the heat... Bread fruit and pandanus trees, fig tree, banana tree. We choose these for shade trees and food – for multiple reasons.*

- Older woman from Betio

### **Short term adaptations to safeguard local infrastructure.**

Three participants (a man, and a husband and wife) noted rebuilding homes that had been affected by strong winds, with more robust designs (e.g. using more nails to hold roofing materials in place) and tougher materials (e.g. placing old tyres or rocks on the roof) to prevent it blowing off in strong winds – identified by the research team as examples of *'build back better'*. Both men and women described building *bwibwi* as a traditional means to protect houses from sea water inundation. Some participants (men and women) collected sandbags from the Council to partially protect their homes from sea water inundation during king tides. This was described as a repetitive process and a temporary solution that could not be relied upon in the long-term.

### Building financial security through livelihood diversification.

Women leaders in Betio described actions they were taking to diversify their livelihood options and build some level of financial security to cope with future climate shocks and stresses. Success in a grant application from the Australian High Commission enabled the purchase of a large oven to bake and sell bread, and 19 sewing machines to make and sell clothing. One woman explained that profits are used to pay for food, clothes, and household expenses. They also loan between themselves (20 families) with 10% interest. Profits provided money in times of crisis, e.g. buying food when household gardens were insufficient due to the increased salinity of the soil, and water when well water was too salty to drink.

*I filled in the application for a grants and worked with other community members to file and submit it. The grant form was complicated but we got \$6000 which we invested in a huge oven and 19 sewing machines.*

- Woman leader from Betio (pictured below)



*Woman leader from Betio, who described her role in a successful grant for the community.*

### Climate smart agriculture to reduce food insecurity.

Participants of Live and Learn's AFF project described emerging transformative actions they had taken through household gardening. A woman described how she was selling some of the cabbages she grew in a Foodcube to a local restaurant, with her family consuming the remaining cabbages. Other AFF participants noted how the vegetables they grew and ate made them feel healthier, and selling some of their produce enabled them to purchase necessary household items, while also accumulating savings.

*We like growing things as a source of food. With a small amount of meat, we can make meals bigger by adding vegetables. It adds value, bulk.*

- AFF project participant

**Increased knowledge about, and practices of, climate smart agriculture.** Participants of the Live and Learn AFF project have increased knowledge of climate-resilient farming techniques using Foodcubes. Nine participants of Live and Learn's AFF project described how Foodcubes were used to grow fruit and vegetables, because growing directly in soil was becoming increasingly untenable due to salinity. Live and Learn draw on existing agricultural knowledge and techniques from participants, as well as using Live and Learn's 'Kainga' family group approach to share new knowledge more widely. There is scope to increase the reach and scale of this project (see recommendations).

### Factors enabling adaptation and climate resilient development

Participants in Betio described various aspects of **human and social capital that supported their adaptive capacity**. For example, they spoke of various skills (fishing, handicraft, mechanic, sewing, business), as well as cultural strengths such as community working together, a culture of sharing and respect for elders. These skills support people to diversify their livelihoods and consider new and innovative ways to support their families as the climate changes. Women, men, older people, young people and people with disabilities consistently emphasised a **culture of sharing resources** with family and neighbours, and increasingly coming together to help each other during and after climate and other critical events. Residents of Betio are collectively investing in and sharing boats, gardening produce, drinking water and information about opportunities for community grants related to building resilience to climate change.

*Without holding hands, we can't move forward. Sharing information is important. If we all work together, we can get anything we want.*

- Woman at community workshop

Research participants noted that the Government of Kiribati's **provision of social protection** to people experiencing unemployment, people with disabilities, and older people has been transformative for some community members. Government benefits provided people with disabilities with reliable, consistent funds to purchase food and water, even in times of stress.

Participants described other **local resources** that supported their adaptive capacity, including **local trees (banana, breadfruit, papaya), and toddy** (sap that comes from an unripe coconut-blossom) which is sold as a drink, with income able to go towards food and household items. **Assets such as water tanks, fishing boats and motor bikes and fish** they catch themselves, or buy at affordable prices, were also seen as resources to support their resilience to disaster and climate impacts.

**Proactive and entrepreneurial attitudes enable people in Betio to try new approaches to adapt to climate risks.**

Women, men and youth described being proactive in applying for small grants, pooling resources, and creating employment or income opportunities. For example, a group of women has been collectively farming, pooling their produce, selling it and saving funds for emergencies. Young people noted locals were starting hairdressing businesses, and collecting plastic waste to turn into fashion accessories for sale. These attitudes of adaptability and entrepreneurship enable innovation and new ways of coping with climate and disaster impacts, through income generated from entrepreneurial activities.

**Barriers to adaptation and climate resilient development**

**Climate change impacts are eroding the ability of people in Betio to access water, grow their own food and withstand severe weather events.** Water and food insecurity, and the insecurity of homes by the sea were severely impacting the resilience of participants involved in the research. Without an environment that supported them, and without options for adaptation, people in Betio were doing their best to absorb shocks and adapt to immediate stresses where they could. As one woman explained:

*We have water, but it has been tested and it's not good quality from the wells... We used to try to boil it, but we can't get rid of the salt.*

– Woman from Betio

**There are limited long-term viable climate change adaptation options in Betio.** Lack of adaption options can be socially determined barriers and limits (e.g. ineffective policy or lack of financial resources), or 'hard' limits such as environmental factors such as loss of land and lack of water. **In Betio, both socially determined and hard limits to adaptation were present.** This is due to the increasing population density of Betio, limited availability and access to land and water, limited financial resources and increasing urgency and severity of climate change. Limited adaptation options pose a significant barrier to community resilience, which has frequently captured the attention of international and local media and propelled growing advocacy in Kiribati – particularly amongst young people - for increased action internationally on climate change mitigation. Lack of adaptation options and limited information and awareness also led to maladaptive responses in Betio (e.g. pouring bleach down wells to 'clean' water and purify the well and cutting down trees to prevent storm damage).

All stakeholder groups emphasised the **reduced availability and quality of groundwater and rainwater** as a barrier to resilience. The combination of increased demand on groundwater supplies from rapid urbanisation, increased heat, unpredictable rainfall and coastal erosion all put pressure on limited water resources. People in Betio have been relying on drinking water delivery by the public utilities

board, however distribution has not been consistent or sufficient. Water has also been pumped from nearby Bairiki, however the amount is insufficient for the population of Betio. Some people have resorted to illegally connecting pipes from the main water supply, which can cause damage, unequal access to, and over-extraction of, the system. A solar desalination plant is currently being constructed with the intention of desalinating seawater and providing drinking water to the entire population of Betio in the near future.

*We try to save money for water tanks, but there's no space to install it.*

– Woman from Betio

**The competing concern of overcrowding was a key priority**



*Youth discuss their priorities for addressing climate and disaster risks in Betio at the community workshop.*

**for people living in Betio.** The causes of overcrowding were in part driven by environmental change (e.g. coastal erosion forcing people to live in increasingly smaller areas), however the primary driver was migration from outer islands to Betio to live closer to employment opportunities. The island of Betio is leased by government, however land and housing planning regulations have in some cases not been followed, leading to increasing subletting. The impacts of overcrowding added to ongoing climate change impacts as well, for example, increased pressure on sanitation systems (overflowing septic tanks), increased heat as more people live in small areas, and increased demand on limited water and food supplies.

*It's very hard to get fresh air because when it's very hot people go out to get some fresh air at the edge of the island because there's just no space.*

– Woman with a disability, Betio

## Community priorities

During case study activities, community members identified strengths that enabled their response to climate change and disaster risks. The research team analysed the long list of strengths, and consolidated them into five themes. During the community workshop, participants discussed the five themes in terms of their importance to further support resilience to climate change and disaster risks.

Demographic groups had different perspectives of strengths they saw as most important to take forward to address climate and disaster risks, which they discussed and voted upon during research activities.

Older women in Betio valued the continuation of cultural identity, knowledge and practices. One woman noted:

*We need to prioritise our cultures. We have to acknowledge our ancestors in protecting our lands. Prioritise love, respect, elders and family above all else. It will ensure peace and togetherness in combating any issue.*

- Older woman from Betio

Older men also saw the continuation of culture as critical in addressing climate and disaster risks, as well as more sustainable natural resource management.

*Natural resources should be protected. If managed properly and we take what we need only, we can protect the rest for our children.*

- Older man from Betio

Young people prioritised 'Access to finance, economic opportunities and enhanced mobility' as a means to address climate and disaster risks. They described the effectiveness of grants and income as ways to take action against the climate change challenges they saw in Betio.

*We need many sources of income, employment and grants. Focusing on earning more will allow us to help our families and communities by funding our movements ourselves. Earning well will mean we can help others more easily.*

- Young woman from Betio

Men highlighted the need for more sustainable natural resource management and skill development, noting the significance of the ocean as a resource for food and livelihoods.

*The assets of our country mostly come from the water. As men, we need to protect our resources and maintain skills that will sustain us and our children.*

- Man from Betio

Women's focus for a climate resilient future was an increased collaboration within Betio.

*Working together in collaboration will solve all our problems. When information comes to us we have to work together.*

- Woman from Betio

Figure 2. illustrates the five consolidated themes as identified by Betio community members. Community workshop participants prioritised the themes they saw as important to further support resilience to climate change and disaster risks through a voting activity. Each circle's size reflects the number of votes from different groups prioritising these strengths. The bubbles inside the circles correspond to different groups who voted for the strengths. Larger bubbles represent a higher number of votes received, indicating greater priority.

Overall, the most commonly emphasised priority for future resilience was 'access to finance, employment and economic opportunities', however this was mostly prioritised by young people. The most consistent priority across all demographic groups was 'information sharing and networking', which was seen to be increasing recently. Older men and men also prioritised the 'protection of natural resources and physical assets' over 'information sharing and networking'.

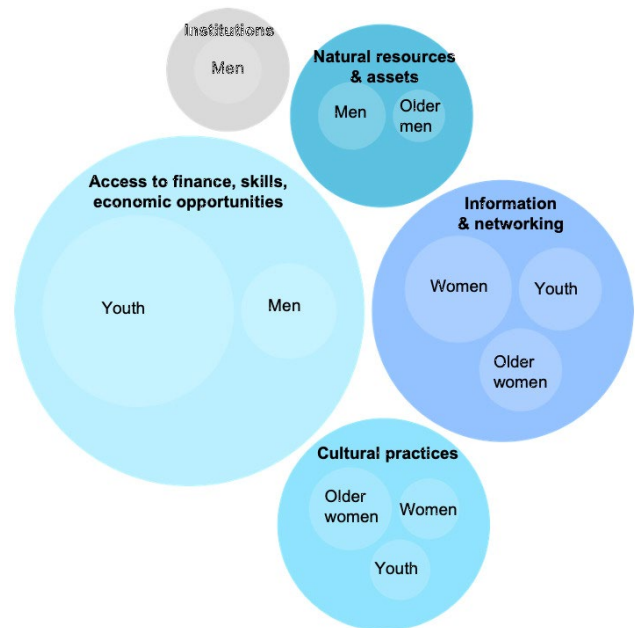


Figure 2. Results of workshop voting activity, where participants prioritised the strengths they would like to build on for future resilience to climate change and disaster risks.

A common recurring theme identified by all groups was the need to work together – 'Ikarekebai' – to address climate change. This was described as a cultural value and practice that underpins the way i-Kiribati people collaborate within communities.

## Insights and recommendations

This Case Study has identified recommendations and pathways for development programs to enhance community resilience:

### Address urgent climate challenges in urbanising contexts.

This case study highlights the competing development concerns faced by Betio residents, which are exacerbated by climate and disaster impacts. Inadequate infrastructure (e.g. housing) and lack of access to basic services (e.g. water and sanitation) are urgent issues in Betio. A growing population faced with an unpredictable climate is only putting further pressure on already constrained services and resources. Genuine engagement and consultation with diverse community members, including women and people with disabilities, will be essential to design sustainable and appropriate solutions in Betio and other urbanising contexts in the Pacific.

### Leverage traditional and cultural practices as entry points for building climate and disaster resilience.

A strong theme of collective action and a willingness to work together emerged from research participants in Betio. This research highlights that there are opportunities to foster collaborative community action on climate change resilience in a holistic manner. For example, Betio Town Council has successfully mobilised residents of Betio for community clean ups in the past, and research participants consistently expressed a willingness and necessity to work together more regularly and holistically, as opposed to solely reacting to discrete opportunities to address specific problems. Female research participants and youth in particular were highly motivated to take collaborative action, but the extent to which they had voice, decision-making power and control over resources in their communities was not clear and could be further explored. Development partners can support traditional and cultural practices as entry points to further progress community-defined climate and disaster resilient actions.

### Support local organisations to understand community contexts for bottom-up design of climate and disaster resilience projects.

Despite having worked with people in Betio on AFF activities for some time, Live and Learn Kiribati staff reflected on how much they had learned as a result of co-leading the data collection and analysis processes. Spending four days in Betio was a valuable – yet unusual experience for Live and Learn staff, who rarely have the chance to delve deeply into hearing community issues from diverse community members. Time and resources are required for local organisations to conduct necessary participatory context analyses, to support design, implementation, monitoring and evaluation processes together with communities and collaborators. Ensuring designs, monitoring and evaluation are appropriate to the

local context, respond to opportunities and strengths and are fit for purpose enables effective locally-led programming with a greater chance of community ownership. Time and resources for this critical step needs to be built into design, budget, monitoring and evaluation processes.

### Develop or strengthen appropriate channels for governments to hear from diverse community perspectives on climate change and disaster resilience.

The case study provided examples of *unimane* (older men) discussing issues and concerns with local government, which aligns with Kiribati culture, governance and decision-making practices. While *unimane* can represent the concerns of other stakeholder groups in their discussions with government, climate and disaster resilient development investments should consider diverse perspectives in the design and implementation of activities. Development partners could therefore focus efforts in ensuring men, women, youth, people with disabilities and other socially excluded groups' voices and perspectives are heard by government.

### Extended and ongoing support on food security is needed in Betio, linking to livelihood and income generating opportunities.

Live and Learn's AFF project demonstrates an effective approach to grow food in space constrained environments with poor soils. Examples within the case study emerged of AFF participants benefitting from improved nutrition, new skills and new sources of income as a result of the project. The population in Betio is large enough to support significant scale up of this opportunity, which would provide families with income to further support their resilience to disaster and climate risks.



*The older women's group (Uniane) present their discussion points back to workshop participants. [Photo credit: Anna Gero, UTS-ISF]*