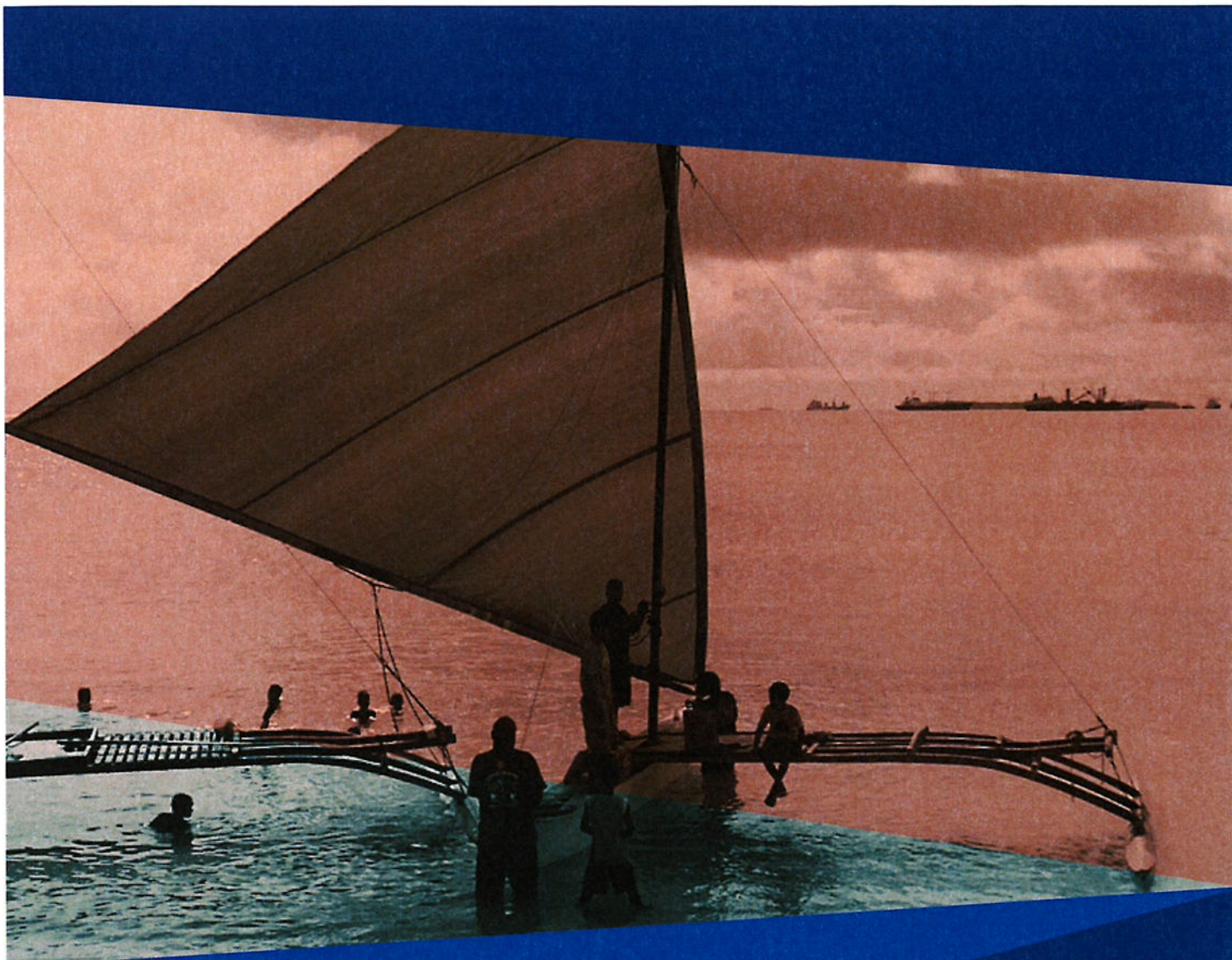


Annex



My heritage is here Eñin ej Jolet eo Aō

Report on Consultations with Communities
in the Marshall Islands in Support of the
Development of the National Adaptation Plan

Ripoot in meļeļe ko jān jukjukūn pād
ko ilo Majōļ me rej rejetake ejaakin
National Adaptation Plan eo



JO-JIKUM



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Executive Summary

This report presents findings from consultations with communities to inform the Marshall Islands National Adaptation Plan. Multiple methods were used in 123 days of site visits across 15 atolls and islands to hear from 1362 people (3% of the national population).

The consultations clearly show that people in the Marshall Islands strongly aspire to continue living in their homelands, which is sustained by their access to place-based natural resources. These factors are key to their sense of place and security.

Yet this aspiration is clearly threatened by climate change. People across the Marshall Islands are observing changes in their environments, including rising sea-levels, increasing air temperatures, and increasing drought and more erratic rainfall. These observations have been made in every island, and by women, men, and youth.

These environmental changes are having widespread and significant impacts on people's lives. Increasing heat, drought, and sea-level rise are undermining livelihoods, causing food and water insecurity, damaging infrastructure, increasing illness, and diminishing social interactions. There is damage to infrastructure and crops, and there are losses of health, land, and social opportunities. These impacts will amplify as emissions increase, and if there is no adaptation to help avert or minimise them.

People in the Marshall Islands are not passive victims of these changes. They are responding the best ways they can, but these responses are constrained by poverty and a lack of access to services. They are thoughtful about what forms adaptation might take to ensure they can remain in the islands they call home. Over 99% of people consulted reject the idea of migration away from their home islands as an adaptation.

The Government of the Marshall Islands and the international community have a huge opportunity, and responsibility, to work together to implement policies and programs that support local actions to adapt. Informed by communities across the country, this report suggests 44 actions across multiple sectors to support people to live dignified and flourishing lives in their homelands well into the future. Acting soon, and ambitiously, can both protect the rights and aspirations of Marshallese people, and establish the Marshall Islands as a world leader in climate change adaptation.

Riboot in ej kwalok toprak in maanjappopo ko barainwot

ej etali aikuj ko an jukjukun pad ko ikijen [National Adaptation Plan] eo an aelon in Majol. Elon kol ak waween ko rekar kojerbali iumin 123 raan in aer lolok 15 aelon ko im ron jen 1362 armej (3% in oran armej in Majol).

Toprak in karok kein rej kwalok ke armej in Majol rej kanooj in ellowetak kon aelon kein aer im renij kotopade aer maron mour wot ilo ijoko jikier, ilo an bidodo aer maron drelon im loke kein ekkkan ko an lojet kab ane eo jimor. Men kein relukin aurok nan aer maron mour ilo ejjelok uwota.

Botaab kotopad in enij aban kon oktak in mejatoto. Armej ro ilo aelon in Majol rej loe oktak ko ilo belaak in jikin jokwe ko aer, im rej loe an utiejlak dan in lojet, emaanaanlak mejatoto eo, ekutkut lak iien mora, kab iien wot. Aolep kora, emmaan, kab ajiri ro jen aelon ko kajojo rej loe oktak kein.

Oktak in melan ko kab lan eo elab aer jelete mour ko an armej ro. Ilo an maananlak mejatoto eo, ekutkut iien mora, kab utiejlak dan in lojet, men kein rej jeleti mona kab dren in daak ko, rej kajooraani em ko, kolaplak naninmej ko, kab kadiklok an armej koba ippen doon ilo doulul ko. Ewor joraan ko rewalo nan em ko kab kein ekkat ko, ewor jerata ko ilo ejmour, ane eo, kab doulul in armej ko. Ne elaplak ad kojerbali kaan ko rej katoonoone mejatoto eo, enij laplak joreen kein ne ejelok ad maanjappopo nan kadiklak ak jotoki kaan kein.

Armej in Majol rejjab pad kake oktak kein. Rej komman jonan wot aer maron botaab ewor aban jen jeramol kab aban in elolo jipan ko. Elap aer lomnak kon **kakkōnkōn** ko remaron boki nan aer maron bedwot ilo aelon kein aer lamoran. Elaplak jen 99% in armej ro rekar jab erre ilo lomnak in ejjebloklok nan aelon ko rilikin, einot juon iaan **kakkōnkōn** ko remaron boke.

Kien eo iolap an Majol kab aelon ko relikin, ewor aer juon iien emmanman nan aer itok ippen doon im bok eddoin jermal kein nan kajutak kien kab burojaak ko nan an jukjukin pad ko maron jineeti maanjappopo kein. Jen ad katak jen jukjukin pad kein, riboot in ej kwalok ke ewor 44 waween ko jeet iaan raan peejne ko remaron jipan armej ro nan aer maron mour ilo ijoko jikier wot nan ilju im jeklaj. Ne emokaj ad bok buntun ne kein, jenij maron kojparok jipadpad kab maron ko an armej in Majol, im likit aelon in Majol einwot juon ritol nan lal in ilo **kakkōnkōn** ko an oktak in mejatoto.

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1. Introduction

Given existing concentrations of greenhouse gases in the atmosphere, and inevitable future emissions, the Republic of the Marshall Islands (RMI) will experience significant changes in its environments. These changes pose significant risks to the people of the RMI, and to the integrity and functioning of the Republic. The process of managing these risks is called 'adaptation to climate change', and it is necessary for the RMI to survive and flourish through a changing climate.

To guide adaptation in the RMI the Government is developing a National Adaptation Plan (NAP). In order to ensure that the NAP responds to the needs and values of the people of the RMI, consultations with communities were conducted. This report summarises the way these consultations were conducted, and their key findings.

The report is structured as follows. The next section (section 2) sets the context for these consultations by explaining why community consultations are important for adaptation planning, and how they have been done in other countries. Section 3 explains the approach that was taken to consultations in the RMI, and the methods that were used. This is followed by sections reporting on the findings of the consultations, beginning with an explanation of what communities who were consulted value about their lives (section 4). These values are the overarching purpose of adaptation in the RMI. Section 5 discusses the climate-related changes that communities are already observing, which is helpful for calibrating projections of environmental changes from environmental modelling to local perceptions. This information also

helps distinguish between environmental and non-environmental drivers of climate impacts on people's lives. Section 6 then discusses how climate-related changes are affecting people's daily lives, which helps understand which issues are most salient to people and therefore which solutions will be most legitimate and effective in the short-term. This section also explains people's concerns about future climate impacts, which helps establish which problems might need addressing in the medium and longer-term. The next section 7 discusses the other processes that amplify the impacts of climate change on people's lives, suggesting that many of these non-climatic drivers present no-regrets opportunities to reduce vulnerability that have co-benefits for climate change adaptation, sustainable development and human development. Section 8 explains how people are already adapting to climate change and the ideas they have about future actions, recognising that both their present actions and ideas about future actions are constrained by information and resources.

Taken together sections 5 - 8 provide critical information about what people think and feel about climate change now and into the future, which helps ensure future adaptation in the RMI meets people's needs (and so avoids maladaptation). Section 9 discusses the implications of these findings for adaptation planning and implementation in the RMI. Section 10 concludes the report.

2. Background: Community Consultations for Climate Change Adaptation

2.1. Introduction

This section begins by briefly explaining what this report means by climate change adaptation, adaptation planning and adaptation pathways. This is necessary to explain why consultations with communities are important. It then provides a brief overview of the extent to which consultations are used in adaptation planning and NAPs, and the ways in which consultation is done in these other examples. In comparison to these other examples the consultations conducted with communities in the RMI to inform its National Adaptation Plan set a new standard for community consultation in adaptation planning.

2.2. Adaptation

Adaptation to climate change is the process of adjustment to reduce or avoid harm from the effects of climate change (IPCC 2014). While adaptation is often thought about as a process for avoiding losses and damages, it can also be a way to create new opportunities and benefits. For example, adaptation to protect water security may do little more than sustain existing systems that are inadequate, but done well adaptation could lead to improved systems that enhance water security.

Because the effects of climate change are uncertain and will unfold over many decades and well into the next century, adaptation is best approached as a process of adjustment over time. It is not a single activity or project that can 'fix' the problem of vulnerability to climate change, but rather a sequence of changes taken over time, with constant monitoring and learning and adjustment in response to new information about climate change and about the effectiveness of responses (Hasnoot et al., 2013). Adaptation to climate change is therefore challenging for all countries and communities.

Adaptation "The process of adjustment to actual or expected climate and its effects... to moderate or avoid harm or exploit beneficial opportunities." IPCC, 2014: 1758

Many countries, including the RMI, are not responsible for the emissions of greenhouse gases that make adaptation necessary, but still bear the burden of adaptation. This injustice is recognised in the UNFCCC and the Paris agreement, which obliges developed countries most responsible for emissions to assist vulnerable developing countries like the RMI to adapt

to climate change (Okereke and Coventry 2016). Such assistance has been too slow, insufficient, and not well coordinated (UNEP 2022). It is also the case that even should the RMI receive the full costs of adaptation, most of the hard work will still fall on the government and communities who will have to manage complex processes of change in their lands and seas over coming decades.

This does not mean adaptation is impossible. While the RMI faces key barriers to adaptation, mostly arising from the costs of adaptation and inadequate transport infrastructure, it also has a few key strengths, one of which is deep knowledge and traditional systems that have sustained island populations for thousands of years, including through past changes in climate and sea-levels, colonisation, war between the United States and Japan, and nuclear testing (Bordner et al., 2020). The Marshallese people know how to adapt, and this is a key foundation on which to build adaptation to climate change.

Key findings from decades of research on climate change adaptation include that adaptation is most **efficient** when it is well planned, coordinated, mainstreamed across all sectors and scales, and commenced as soon as possible (Schipper et al., 2022). It is also known to be most **equitable** when it prioritises those who are most vulnerable to climate change, which includes people: whose livelihoods depend on climate-sensitive resources (such as fishing); with low-incomes; with existing illness; with a high number of dependants (such as carers of children and elderly people); with lower levels of literacy; who have limited mobility due to disability, poor infrastructure, and high transport costs; who have difficulty accessing essential services such as education and healthcare; who have limited influence over decisions that affect their daily lives; and who are discriminated against for religious, cultural, physical or sexual orientation (Adger 1999).

Adaptation is most **effective** when it is demand driven – that is, it responds to national and local needs and values (Eriksen et al., 2011). It also requires high levels of trust and cooperation within communities, between communities and governments, and within governments. Importantly, in countries and communities such as in the RMI, adaptation works best when it seeks to work through existing development priorities and processes, rather than creating new issues and institutions, whose creation takes time, human resources, and money away from agreed development goals (Owen 2020).

Adaptation is **enabled**: by information about what to

do and how to implement change; when adaptation options deliver co-benefits that are valuable to communities, such as job opportunities, improved services, or reduced costs; when it is implemented through existing institutions such as those responsible for the provision of water, or urban planning; and when key actors such as government, community, and private sector leaders can see cultural, development, economic or political benefits from adapting (Barnett 2022).

2.3. Adaptation in atolls

Adaptation plans must find a way to deal with uncertainty, and there is a great deal that is not yet known about the impacts of climate change on atolls. There are three sources of uncertainty about the effects of climate change on atolls (Barnett et al., 2022). First, there is uncertainty in projections about how much the climate will change, which arises because there is uncertainty about how much emissions of greenhouse gases there will be. The trend of more warming, rising seas, and changes in climate and oceanic processes is clear: some change is now occurring, and more change is inevitable, but the amount of change, and the timing of changes is still unclear. For example, sea-levels in the central Pacific Ocean are likely to rise by between 47 and 90 cms (18.5 and 35.4 inches) by 2100 depending on different mitigation scenarios considered in the recent assessment from the Intergovernmental Panel on Climate Change (IPCC) (Fox-Kemper et al. 2021). Adapting to a 47 cm (18.5 inch) rise in sea-level by 2100 will be easier than adapting to a 90 cm (35.6 inch) rise, but the best estimates of scientists still cannot say which is most likely.

The second area of uncertainty concerns how environmental systems will respond to changes in climate and oceans. There is a great deal of uncertainty about the response of atoll environments to changes in climate and the oceans (Mycoo et al 2022). For example, not all coral reefs respond in the same way: depending on their structure and function and the extent of human impacts some reefs are better able to grow with rising sea-levels, and some are more resilient to extremes in sea-surface temperature than others (Hoadley et al., 2021). Then there is uncertainty about the future shape and size of islands (Kench et al., 2018). The evidence for island responses thus far suggests that few atoll islands are contracting, but many are changing shape (Duvat 2019, Holdaway et al., 2021). Scientists tend to agree that atoll islands may roll-back towards lagoons, with the question being how many are able to respond in this way, under which conditions, and for how long (Masselink et al., 2020).

The third area of uncertainty concerns what adaptation can do. As noted in the most recent IPCC report on small islands, “there is limited information on the effectiveness of the adaptation practices and the scale of action needed” (Mycoo et al. 2022: 2046). Not much is known

about adaptation on atolls because there has been little investment in research and on tangible initiatives (UNEP 2022). In theory adaptation can significantly reduce climate impacts on atolls. For example, there are already highly engineered islands (such as Hulhumale in the Maldives) that are likely to be sustainable through a changing climate (Brown et al., 2020). There are also a range of existing practices and technologies for the supply of water and treatment of waste, for coastal management, for energy and housing, and for communications and transport that, if applied in atolls, could significantly reduce vulnerability (Barnett et al., 2022).

Given these uncertainties it is premature to conclude that the magnitude of environmental changes driven by climate change will surpass limits to adaptation in atolls, though there is no doubt that the evidence suggesting decreasing habitability is a very significant risk (Mycoo et al., 2022). But risk is not a prediction, and great care is needed with predictions as they can become self-fulfilling prophecies (Barnett 2017). Much more research is needed, particularly about the biological responses of islands, and about the scope for adaptation. In the interim, given the limits of climate science to observe impacts at the local level, given that local communities are already adapting, consulting with communities is one way to help reduce uncertainty about both climate impacts and about adaptation.

2.4. Adaptation plans

Because adaptation is a process of adjusting to changes in climate that will continue for many decades to come and affect almost all sectors and places, a longer-term, strategic, and coordinated approach to its implementation is necessary. This is the purpose of **adaptation plans**. Adaptation plans are developed by authorities responsible for the governance of places, sectors, and in some cases organisations and businesses.

Adaptation plans are strategies to guide the orderly implementation of adaptation actions over time and across all sectors to maximize the health, safety, and economic prosperity and well-being of all people.

Most adaptation plans are developed by urban and municipal authorities in developed countries and are developed through institutions responsible for urban and land use planning. These almost always focus on cities and towns. There are very few adaptation plans developed for rural communities, and even less for those in developing countries. In some countries ministries responsible for sectors of activity, such as agriculture, tourism, or water develop adaptation plans for those sectors. The other major type of adaptation plans are those developed by national governments.

The vast majority of countries have developed adaptation plans of some kind, either in the form of stand-alone NAPs, National Adaptation Plans of Action (NAPAs), or as part of their National Communications to the United Nations Framework Convention on Climate Change (Kim et al., 2017, Mullan et al., 2013, Woodruff and Regan 2019). There is no standard approach to NAPs, they differ in their purpose, structure, and detail, and they are developed in various ways. As explained below, community consultations are rarely used to develop NAPs.

A key lesson for the development of NAPs for low and middle-income countries such as the RMI is that they are most effective when they take a 'development first' approach rather than a 'climate first' approach (Kim et al., 2017). Earlier NAPs sought to identify project-level interventions that only responded to discrete climate change risks, yet this 'climate-first' approach often did little to address existing national and local needs and priorities such as those related to infrastructure, health care, and improvements in livelihoods and security. This resulted in adaptation projects that were not well-supported by governments and communities, and which were ineffective, unsustainable, and at worst maladaptive (Eriksen et al., 2021).

Effective adaptation plans:

- 1) have a clear purpose, vision for the future informed by values, and defined and measurable outcomes
- 2) have a strong basis in evidence of climate change risks, of past and present adaptation practices, and of social preferences and needs
- 3) identify diverse strategies to manage climate risks, including through policies, regulations and standards, infrastructure investments, technologies, new practices, taxes and incentives, education, and research
- 4) are informed by meaningful public participation including with marginalised and remote groups in order to avoid injustices and maladaptation
- 5) take a "development-first" approach, rather than a climate stressor-driven approach;
- 6) specify processes for implementation, including who is responsible, the timing of actions, funding sources, and monitoring
- 7) outline arrangements for coordination and integration with other actors, sectors, and plans
- 8) have strategies for dealing with uncertainty and surprise

(adapted from Kim et al., 2017, Meerow and Woodruff 2020).

A 'development-first' approach places development goals and priorities at the centre of the adaptation planning process. This can lead to a broader range of responses across multiple scales that can both reduce climate change risks and support development needs and priorities. It also helps ensure development processes are resilient to climate impacts (Pervin et al., 2013). For example, a climate-first approach to adaptation to more intense storms typically favours better forecasting and early warning systems, whereas a development-first approach would favour new building codes and designs, improved or new public buildings (such as schools) that can serve as storm shelters, better land use planning to avoid locating assets in wind- and wave exposed areas, diversifying crops to varieties that are more wind and salt tolerant, upgrading critical infrastructures such as for power, water and transport systems so they are more resistant to damage, and small-scale index-based disaster insurance facilities.

Academic reviews of adaptation plans across the world suggest that few communities are adequately planning for climate change (Meerow and Woodruff 2020). Good adaptation plans rely on effective community participation, including to define goals, provide a strong evidence base about local changes, identify appropriate adaptation strategies, and avoid injustices and maladaptation (Meerow and Woodruff 2020).

2.5. Adaptation pathways

A key way to manage uncertainty is to develop **adaptation pathways**. An adaptation pathway is a strategy that outlines a sequence of actions over time, each of which is triggered by a change in environmental or social conditions (Hasnoot et al., 2013). These triggers points indicate when the next adaptation action is to happen (Werners et al., 2015). In this way adaptation pathways establish where adaptation should happen, what adaptation should involve, and, importantly *when* adaptation should happen – which is not a set date, but only when conditions make change necessary (Werners et al. 2021). Adaptation pathways are efficient as they enable adaptation to be a process that can begin now with low regrets, and which is spread out over time in response to changing conditions and new information (Barnett et al., 2014).

Adaptation pathways are best developed for places (such as towns), environmental systems (such as coastal areas), and sectors (such as for agriculture). They are not well suited to large scale systems and for whole countries. A NAP might therefore include within it a series of adaptation pathways that establish how adaptation is to happen for different places, or sectors. Adaptation pathways are ideally suited for planning local adaptation, including for in atolls (Magan and Duvat 2020).

An adaptation pathway is a strategy that outlines a sequence of actions over time, each of which is triggered by a change in environmental or social conditions. Adaptation pathways are ideally suited for planning adaptation in atolls.

Consultation is critical for developing local adaptation pathways (Barnett et al., 2014). The trigger points that determine when another action is to be taken must be decided by people who bear the burden of the risk – in most cases this is local communities. These people should also decide their preferred adaptation options over time, many of which may involve trade-offs (for example many coastal defence options degrade coastal habitats, and adaptation under high rates of change may require innovations in land tenure regimes). Thus, consultation is important to ensure that adaptation responds to what local people think is important and the risks they are willing to take, and to making sure that solutions are based on local knowledge and are culturally appropriate (Donner and Webber 2014). Community consultations are therefore necessary to develop adaptation pathways for local communities.

2.6. The value of effective community consultation for adaptation planning

Extensive and well-designed community consultation has multiple benefits for national level adaptation planning. The value of engagement with a wide range of actors in the development of climate policy is a well-established principle of international environmental agreements (see Hügel and Davies 2019) and community consultation is increasingly considered a requirement for accessing finance for adaptation, and as a means of monitoring and evaluating adaptation projects. As explained below, consultation is rarely done well in NAPs, and through its consultation process the RMI will set a new standard for consultation in adaptation plans, which will serve it well as it seeks support from donors and other partners in the implementation of its NAP.

Community consultation can improve the legitimacy of adaptation plans at national and local scales. Consultation helps to effect changes for adaptation from within communities, rather than imposing adaptation upon them (Burch et al., 2013; Ensor and Berger 2009). It can also help to ensure community expectations and understandings are better aligned with those of governments and development agencies (Nicholson-Cole and O’Riordan 2009), and to foster greater trust and cooperation between governments and local people (Swartling et al., 2015). For this to be effective the consultation process needs to be carefully designed so that it captures the ideas, needs and value of the people in local communities, rather than reflecting the interests

and ideas of powerful actors such as development banks and governments (Agrawal 1995, Cooke and Kothari 2011, Few et al., 2007). In this way consultation can help improve the governance of adaptation (Pelling 2011).

Consultations can also help improve scientific understandings of climate change (Agrawal 2005) and encourage iterative learning about climate impacts and adaptation strategies for local communities. They can help ensure communities better understand and integrate climate risks into their development planning, and in turn ensure that climate change adaptation planning responds to communities’ choices and needs, and works with their social norms, rules, and demonstrated capabilities and cultures (Ensor and Berger 2009). For this to be effective consultation on adaptation should be an iterative process. Conducting multiple consultations over time also helps encourage learning, feedback and trust, and so more responsive and effective governance, which is critical in conditions of high uncertainty such as is the case with climate change (Swartling et al., 2015).

The research on adaptation planning and implementation almost uniformly agrees on the need for community consultations, but it also stresses that governments around the world find this difficult, and that they rarely do it well (Few et al., 2007; Meerow and Woodruff 2020; Moser and Pike 2015). This lack of effective consultation on adaptation is generally true for adaptation projects in Small Island Developing States (Butcher-Gollach 2015, Scobie 2018, Thomas et al., 2019). A lack of consultation in the Maldives has been noted in several studies (Rasheed and Abdullah 2020, Robinson et al., 2022), and it is said to be cause of project failure and maladaptation in Kiribati (Cauchi et al., 2021, Piggott-McKellar et al., 2020). Conversely, it has been shown that adaptation interventions are more sustainable when communities are involved in their design (Cauchi et al., 2021, Jarillo and Barnett 2021). Nevertheless studies report that excessive consultations in the interests of multiple development projects leads to community fatigue, and resistance when such consultations do not result in change (Baker et al., 2011; Donner and Webber 2014; Rasheed and Abdullah 2020).

2.7. Consultation for National Adaptation Plans

Despite the recognition of the multiple values of consultation for adaptation planning, engagement with communities is rare in NAPs, and has been identified as the biggest weakness in NAPs submitted to the UNFCCC (Woodruff and Regan 2019). This is not merely a matter of cost, because even in NAPs prepared by OECD countries consultation is rare. Where NAPs have been informed by consultation this is most often done through workshops within government systems, and with business groups: consultation with

local communities is very rare, and consultation with Indigenous groups is extremely rare (Mullan et al., 2013).

So, while consultation is necessary, it is hard to do well. The problem is one of coordination between projects on which consultation is needed. It is also a problem of the method and intention of consultations – too often consultations are done because donors require them and not to learn what communities think and value; in these cases communities are often informed but not actually asked, or their answers and wishes are ignored. Community fatigue is also sometimes a problem of sampling bias, because consultations are most often conducted with communities in or near capital cities, and with more accessible communities, and not in places that are more remote, or with more marginalised and difficult to access groups.

In terms of adaptation plans, 51 Least Developed Countries have submitted National Adaptation Plans of Action (NAPAs), and 8 of these were submitted by SIDS. Consultation with governments was considerable across most of these SIDS NAPAs. In terms of consultations with communities, the Solomon Islands' NAPA was the best informed by consultations, which were conducted with 33 communities across seven provinces. Tuvalu's NAPA was also well informed by consultations in each of the nine inhabited islands, which focused on the executive of local councils, but also included women and youth. Kiribati's NAPA included workshops in each of the two main island groups with chief councillors (from local governments), with older men who hold traditional roles, with women, and with youth. A second round of workshops was held with staff from each of the 20 local government councils. A similar process was followed in Samoa.

More recently, seven SIDS have submitted NAPs. In general, there seems to be less consultation for the NAPs than there was for the NAPAs. In none of the SIDS NAPs are the methods used for consultation clearly described. In some cases, such as Kiribati and Tonga, the NAPs were informed by consultations conducted for other purposes. In Kiribati's case the NAP is an update of the earlier NAPA, for which some consultations, including with communities, were conducted. In Tonga's case the NAP is said to be informed by consultations conducted for the development of 119 community development plans, although the influence of these consultations on the NAP is hard to discern.

In all cases where consultations were conducted specifically for the SIDS NAPs these were dominated by consultations with other government agencies, particularly those responsible for agriculture, fisheries, and tourism. Workshops with staff in these agencies was the key method for consultation. In no SIDS NAP has there been a systematic attempt to consult with local communities: in most NAPs communities only had voice through the participation of a small number

of peak civil society groups in workshops held with other government agencies. The only exception to this is the NAP of the small Caribbean island nation of Saint Lucia NAP, which included input from over 40 fishers, 40 farmers, and 20 artists in workshops.

So, with a few exceptions (e.g. the Solomon Islands and Tuvalu NAPAs, Saint Lucia NAP), there has been minimal consultation with communities in the development of adaptation plans in SIDS. Instead, consultations have been focussed on national governments (NAPs) and local governments (NAPAs). In all cases the only method used has been workshops, and the method and results of consultations are not well described. The locations of consultations are mostly in urban areas, though some NAPAs and NAPs were informed by workshops conducted in provincial capitals or equivalent islands.

2.8. Conclusions

Effective, efficient and equitable adaptation requires plans that are strategic and informed by communities' experiences, values, and needs. For the most part, however, adaptation plans are developed without much input from communities, and are instead informed by people within national and local governments. As explained below, the community consultations conducted for the RMI NAP set a new standard in consultation for adaptation plans in SIDS, and arguably globally.

3. Approach and Methods

3.1. Introduction

This section explains the design of the research that informs this report. The information was collected through two linked projects that investigated Marshallese peoples' experience of climate change, both of which were managed by the International Organisation for Migration (IOM) office in Majuro, and both of which used similar methodologies. The first of these projects was the RMI's component of the *Climate Security* in the Pacific project Phase I, which was funded by the United Nations Peacebuilding Fund, and managed by the IOM office in Majuro in partnership with the United Nations Development Fund (UNDP) office based in Suva, Fiji. This project engaged with communities in five atolls (Ebon, Jaluit, Likiep, Ujae and Utrok) and two islands (Kili, and Mejjat island in Kwajalein Atoll). The second project was the *Community Engagement for the RMI National Adaptation Plan* project funded by the World Bank Pacific Resilience Program Phase II, and supported by the Consultation Technical Team of the Climate Change Directorate of the RMI Government. An initial consultation framework was developed by The University of Melbourne, and developed and adapted

by the Consultation Technical Team, IOM, and Jo-Jikum. This project engaged with communities in eight atolls (Ailinglaplap, Ailuk, Arno, Enewetak, Kwajalein, Majuro, Wotje and Wotho). Data collection was organised and led by IOM in collaboration with Jo-Jikum, the Marshall Islands Conservation Society (MICS), and WUTMI (Women United Together Marshall Islands).

3.2. Sampling

There are 24 inhabited atolls and islands in the RMI that are classified geographically in four important ways. First, the islands run in two parallel chains of islands called Ralik (sunset) and Ratak (sunrise), that stretch across a line running approximately north-west to south-east (see [Figure 1](#)). Second, islands to the north receive less rain and are well known to have greater problems with drought. Third, there are two clusters of urban islands in Kwajalein and Majuro, who between them are home to 78% of the population (Kwajalein has 9787 people or 23% of the total population of the RMI; the urban areas of Majuro have 23156 people or 55% of the total population of the RMI) (preliminary 2021 census).

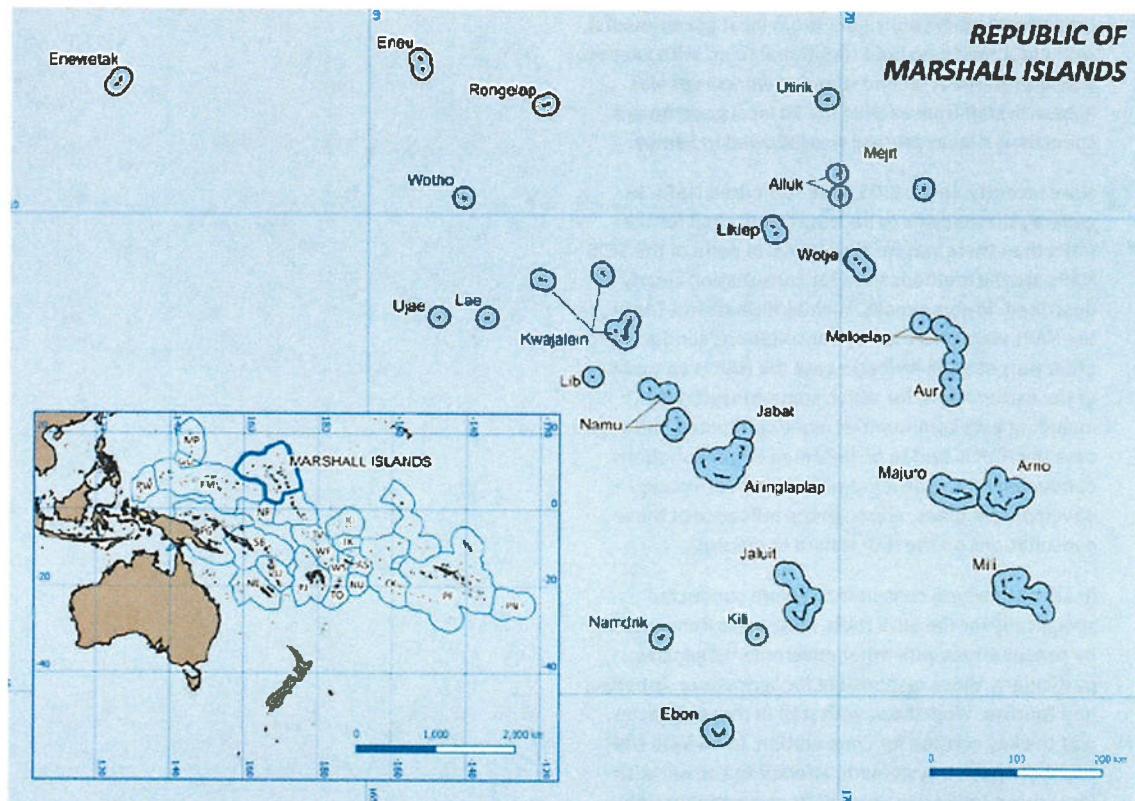


Figure 1: Map of the Republic of the Marshall Islands (source, 2021 Census Table Report)

Finally, the northern atolls of Bikini, Enewetak, Rongelap, Rongerik, and Utrik were sites of (or exposed to) intense fallout from 67 nuclear weapons tests conducted by the United States Government between 1946 and 1958. At that time the United States was the United Nations appointed administrator of the Trust Territory of the Pacific Islands and obliged to “protect the inhabitants against the loss of land and their resources” (Barker 2013: 22). People from Bikini, Enewetak, Rongelap and Utrik were all moved off their islands at some stage during the nuclear testing, and Bikini and Rongelap remain uninhabitable, with their populations moved to Kili and Mejjatto islands respectively.

The design of both the *Climate Security in the Pacific* and *Community Engagement for the RMI National Adaptation Plan* projects was done concurrently to: avoid repeating consultations in some atolls and islands; maximise the number of atolls and islands where people were engaged across the RMI; ensure the communities consulted were as representative as possible of the total RMI population. This also helped ensure both projects used some common methods so that much of the information collected from all 15 communities could be compared.

The fifteen atolls and islands where communities were engaged include those from each four geographical classifications of the Marshalls. They include 6 atolls and islands from the Ratak chain (Ailuk, Arno, Likiep, Majuro, Utrik and Wotje) and 9 from the Ralik chain (Ailinglaplap, Ebon, Enewetak, Jaluit, Kili, Kwajalein – including Mejjatto – Ujae and Wotho). They include atolls from the north that are known to be more prone to drought, including Ailuk, Enewetak, Likiep, Ujae, Utrik, Wotho, and Wotje. They also include the two urban atolls of Kwajalein (Ebeye) and Majuro. Finally, the sample includes four populations affected by nuclear testing: two still residing on their home atolls of Enewetak and Utrik, and two who have been displaced, from Bikini (now living in Kili island) and Rongelap (now living in Mejjatto island).

In all consultations effort was made to speak with an equal number of women and men. This was largely achieved, for example: 47% of respondents to the Day in the Life Survey (see below) were female (the gender was not disclosed or recorded for a further 4%); and 49% of respondents in focus group interviews were female (see [Table 1](#)). Youth were specifically engaged using diverse creative methods (see below) in Ailinglaplap, Ailuk, Arno, Enewetak, Kwajalein, Majuro, Wotho, and Wotje (see the appendices containing summaries of the engagements in each of these communities). Youth were engaged as other members of the community were in the interviews and focus group discussions conducted in Ebon, Jaluit, Kili, Likiep, Mejjatto, Ujae, Utrik. In all sites efforts were made to engage with people with disabilities so as to gain knowledge of their particular circumstances. However, the number of people with disabilities was not recorded, and the number of people who identify as having disabilities is generally low in the RMI and more particularly in the rural islands, possibly because people with chronic disabilities migrate to the United States as they require health services that are not available in the RMI.

Across all sites 31% of individuals participated in more than one method, meaning a total of 1362 people contributed information to either the *Climate Security in the Pacific* or the *Community Engagement for the RMI National Adaptation Plan* projects. Based on the population of islands as stated in the 2021 census, this represents an average of 18% of the populations of Ailinglaplap, Ailuk, Arno, Ebon, Enewetak, Jaluit, Kili, Likiep, Mejjatto, Ujae, Utrik, Wotho and Wotje; 2% of the population of Kwajalein; 1% of the population of Majuro; and 3.2% of the entire population of the country.

Data collection from all fifteen atolls and islands lasted over a period of 18 months between October 2021 and April 2023. In the *Climate Security in the Pacific* project data collection began with the first site visit to Ebon on October 15 2021, and ended on December 9 2022 with the second site visit to Utrik. For the *Community Engagement for the RMI National Adaptation Plan* data collection began with the first site visit to Ailinglaplap on June 28 2022, and ended with the last site visit to Ailinglaplap which ended on April 29 2023.

		Day in Life Survey	Baseline Survey	Hazard Mapping	Focus Groups	Individual interviews	Sum	Sum all methods
Ailinglaplap	F	17	10	49	31		107	273
	M	29	14	79	33		155	
	U					11	11	
Ailuk	F	17	8	24	29	7	85	162
	M	19	4	20	28	6	77	
Arno	F	8	8	0	17	0	33	118
	M	34	15	0	20	0	69	
	U					16	16	
Ebon	F	19			14	3	36	77
	M	21			16	4	41	
Enewetak	F	9	0	5	22	3	39	105
	M	17	0	25	18	6	66	
Jaluit	F	34			42	2	78	166
	M	31			40	2	73	
	U	15					15	
Kili	F	19			21	2	42	74
	M	12			16	1	29	
	U	3					3	
Kwajalein	F	70	2	5	65	0	142	281
	M	46	3	5	75	0	129	
	U					10	10	
Likiep	F	23			23	3	49	86
	M	15			20	2	37	
Majuro	F	67	2	23	87	1	180	371
	M	54	4	20	97	1	176	
	U	6				9	15	
Mejatto	F	14			13	3	30	57
	M	12			13	2	27	
Ujae	F	1			12	1	14	58
	M	20			23	1	44	
Utrok	F	7			13	1	21	61
	M	16			20	2	38	
	U	2					2	
Wotho	F	12	4	11	14	5	46	100
	M	11	2	14	19	8	54	
Wotje	F	20	0	26	26	2	74	137
	M	20	5	19	14	5	63	
Sum	F	337	34	143	429	33	976	
Sum	M	357	47	182	452	40	1078	
Sum	U	26	0	0	0	46	72	
Sum all		720	81	325	881	119	2126	2126
	F	Female	M	Male	U	Undisclosed		

Table 1: Summary of respondents by method by community

3.3. Methods

There were some common methods used in both projects that collected information for this report. These were the Day in the Life Survey, the Focus Group Discussions, Individual Interviews, and Observations.

The Day in the Life Survey is a qualitative research method IOM has used in past projects. It was initially designed to elicit information about menstrual health, asking respondents to record their activities on days with and without menstruation to understand any limitations that menstruation places on women's participation in society. The method has since been adopted to understand differences between people's present circumstances and future circumstances under a changing climate. It is a very useful method for understanding what people value, the distribution of labour along gender and among households, and how people respond to information about climate change risks. As shown in [Table 1](#), a total of 720 people participated in the Day in the Life Survey.

The Day in the Life Survey method had three steps. First, respondents were asked to draw pictures or write details that describe an average day in their life during the week, and again on weekends; they were then interviewed about these pictures. Second, respondents attended a presentation about climate change risks and potential impacts. In both projects these presentations included information about the causes of climate change, the range of potential changes in temperature and sea-levels according to the IPCC Representative Concentration Pathways (RCP), and potential impacts on islands. It is important to note that respondents were showed projections of sea-level rise of 7.5 feet above present levels by 2150, which is consistent with the worst-case scenario presented by the RCP 8.5 pathway. Finally, respondents were then asked to draw and describe their thoughts about how the average weekday and weekend day might differ in 30 years-time given projected impacts of climate change.

Focus group interviews were conducted in all sites. Focus group discussions are qualitative tools that encourage participation (especially of people who are reluctant to give one-on-one interviews) and allow researchers to get in-depth understandings of a group of people's shared perspectives on a given topic (Robson and McCartan 2016). Consistent with best practice, these were typically conducted with small groups (less than 10 people) who were selected according to common demographic or livelihood characteristics (for example groups comprised only of youth, or of women, or of fishers). Focus group discussions were used to elicit information about people's values and aspirations, their observations of climate change, the impacts

of climate change, the broader environmental and development challenges they face, their adaptation responses to date, and their ideas about future adaptation responses. As shown in [Table 1](#), a total of 881 people participated in focus group interviews, some of whom also participated in the Day in the Life Survey.

A smaller number of people (n= 119) were engaged through individual interviews. These sought similar information to the focus group discussions, but were with individuals for whom participation in focus groups was inappropriate for personal reasons, reasons of availability, or because they were particularly knowledgeable so sought out for further information by the research team.

In all fifteen atolls and islands the research team visited for a period ranging from 4 days (Mejatto) to 16 days (Ailinglaplap) at a time. In the *Community Engagement for the RMI National Adaptation Plan* project the research team visited each place once, except Ailinglaplap, which was visited 3 times owing its many islands and communities scattered throughout the atoll, and in Kwajalein and Majuro, where data collection was sustained over a longer period to reach different communities and targeted groups (see below). For this project a total of 72 days was spent in communities collecting data. In the *Climate Security in the Pacific* project the research team visited each site twice, for a total of 51 days. In both projects in all these (123) days in the field the research teams made observations of community interactions, daily life, human movements, infrastructure, livelihoods, and evidence of climate impacts. This information was noted in diaries and in team debriefs after each site visit, and helped provide important context and nuance to information collected through other methods.

The *Community Engagement for the RMI National Adaptation Plan* project employed a larger research team than that for the *Climate Security in the Pacific* project and so was able to use three additional methods (in Ailinglaplap, Ailuk, Arno, Enewetak, Kwajalein, Majuro, Wotho, and Wotje). The first of these was a Baseline Survey that sought to elicit background information from key stakeholders on the community and its situation (n=81). This was particularly useful for communities where there was little pre-existing information. In all sites it helped to elicit information about the broader environmental and development challenges communities face that may amplify vulnerability to climate change, and about past and present projects and activities that directly or indirectly help to reduce vulnerability.

A second additional method was a Hazard Vulnerability and Capacity Mapping (HVCM) exercise that IOM has used in the past to assess disaster impacts and vulnerabilities (n=325). The HVCM was slightly tailored to elicit information about present and future climate change risks, and it often involved site visits and transect walks, where members of the community showed specific sites and infrastructure to the engagement team and discussed their relevance with relation to hazards. This method helped to understand past impacts from hazards and present-day vulnerabilities, and in particular the location of impact hotspots. Such information establishes a baseline of present impacts from which future impacts of climate change (assuming no adaptation) can be better understood. It also helps identify immediate climate change problems that can be addressed in the short-term.

The third additional method used in the *Community Engagement for the RMI National Adaptation Plan* project was the use of creative art workshops to engage with youth. This method was conducted by the members of the consultation team from Jo-Jikum, and follows an approach proven to be effective in Jo-Jikum's past work. In this method participants from the community's youth create art works to reflect their knowledge of the present and their visions for the future. They are first asked to join a small group that then engages in either a painting class or a song writing class. Participants are given the necessary materials and supplies and then over two or three days the instructor from Jo-Jikum guides them through exercises that help them develop the skills for each art form. Participants are then asked to think about the future they would like to see for their island or what changes they have observed, and to convey this in art or song. Participants then share their work with the wider group, and a collective celebration is held as a formal closing and thank you. Participants are then interviewed individually about their creative work. This method helps convey information about impacts, vulnerability and future responses in forms that can be more insightful and nuanced - especially with respect to affect and imagination. It also helps develop the skills of youth. In [Table 1](#) youth are counted as members of focus group interviews, within that population 277 youth were engaged through the creative workshops (20% of all respondents) (see [Table 2](#)).

Data collected from all methods was analysed in two key ways. First, data from the Day in the Life Survey and Baseline Survey was entered into Excel and analysed using a combination of inductive and deductive codes and descriptive statistics. Data collected from Focus Group Discussions and interviews was coded in NVivo (a qualitative analysis software) using a combination of inductive and deductive codes.

	Number
Ailinglaplap	25
Ailuk	15
Arno	36
Enewetak	15
Kwajalein	99
Majuro	23
Wotho	24
Wotje	40
Sum	277

Table 2: Number of youth engaged in each community

3.4. Conclusions

The community consultations conducted for the RMI NAP arguably set a new standard in consultation for adaptation plans globally. Multiple methods have been used to engage with a representative sample of the population, including very remote communities. The engagements did not only inform communities, they also listened. The methods were purposeful, the data was recorded, stored, shared, processed and analysed, and these methods and their results are described in this report. The findings reported here are therefore robust and strongly indicative, particularly with respect to findings about people's observations of climate change, the impacts of climate change on their lives, and the non-climatic factors that amplify these impacts. It is also useful for understanding people's current responses to cope with and/or adapt to climate change, and their ideas about potential future adaptations, both of which justify sets of demand-driven adaptation responses that can be implemented in the short and mid-term, and which would likely be well received by communities providing appropriate means of implementation.

4. RiMajol values to guide adaptation

4.1. Introduction

Adaptation to climate change is not necessary if there is nothing of value to protect from climate risks. The kinds of adaptation that may be necessary depend on what is valued, and often means trading off some values for others. For example, adaptation to protect a school on the coast may involve building a sea-wall, but this may damage the nesting areas of turtles; and resettlement may mean people get better access to education services, but this may come at the cost of their cultures, communities, and property rights. So, knowledge of what people value is important for understanding the need for, efficacy of, and risks associated with different kinds of adaptation responses.

Therefore this section reports on the 'lived values' that were recorded in the consultation process. 'Lived values' are the "valuations that individuals make about what is important in their lives and the places they live" (Graham et al., 2013: 49). The data that informs this section is of two broad types: first, the things people said were important to them in their daily lives, and second, observations about how people live.

4.2. Lived values in the Marshall islands

Across all island and atolls a constant and dominant value expressed by many people was the value of homelands for their culture and identity. Respondents said, for example:

"This is where our ancestors lived and where they're buried. This is our home that's been blessed by those before us. We will die here": and "my heritage is here"

This sense of belonging and place attachments is common to all islands, but more so in rural islands. It was not a value that differed among men or women, or adults and youth, with rural youth equally expressing pride in their culture and traditions. In this context people expressed a strong desire for and responsibility to preserve the land and its resources for future generations, saying, for example:

"My aspiration is to see a future where everyone can work together to come up with solutions for our country to address issues like climate change impacts, corruption, land issues, have better medical care, better educational opportunities, and more."

There is a strong overlap between people's value of their cultural traditions and their sense of being supported by their community, saying, for example:

"Culture is thriving, community members help each other out": and "I love staying here because I like the way people here look after each other and help each other."

Many of people's social interactions occurred through the church, which is a key institution in all rural islands. People value their religion and attending church activities in their community, and many people reported that they prayed on a daily basis.

There are subtle differences in identities between islands that relate to their particular histories and characteristics. For example, people in Ebon take great pride in the fact that their *Aelon in Meram* (Island of Light) was where the first permanent settlement of missionaries and the first church in the RMI was established in 1857, and they refer to this history at times when community cohesion is threatened by conflict. People in Wotho are proud of their island's history as a food basket for the region.

The value of family and friends was also very important for most people, and this value was strongest for people in Kwajalein. People reported and were observed to live very routine lives that revolve around home and the community. This was particularly the case for women who bear the burden of work for domestic and social reproduction. Women, in particular, spend time inside cooking, cleaning, tidying up the house, washing clothes, making handicrafts, and looking after children. Whereas some (but by no means the majority) of men report having some leisure time in their days, very few women did. Men in Kwajalein sometimes said they enjoyed drinking kava and playing bingo with their friends, and were much less likely to say they went fishing or harvesting natural resources.

Another widely shared value is for 'freedom', which is strongly related to customary rights to the natural resources that support people's livelihoods. These values were mostly expressed by men aged 25-64 years old, demonstrating their traditional responsibility for procuring food through farming, fishing, gardening, and harvesting. The value of freedom was also strong for people from Kwajalein even though almost all people there do not have customary rights to local resources and do not spend time spent on food procurement, with some participants mentioning how they valued their freedom to do what they want compared to life in the US, and not having to pay rent. The only exception was in Likiep, where the value of freedom was not commonly expressed given that for historical reasons all decisions about land use are vested in two families rather than resting with households. The idea of freedom and an 'easy life' (see below) are often in the forefront of people's minds given their high awareness of the alternative ways of living in the United States (see section 8).

In most islands people highly valued the access they have to natural resources to support their livelihoods and recreation. While some older people described their islands as 'paradise', it was youth more than any other group that seemed to value their environments for their recreational opportunities (such as canoeing and fishing) and for their amenity values, describing their islands and resources as 'gifts' from those that came before them.

The value placed on access to natural resources and environmental amenity was much less in Ebeye (Kwajalein) given the island's limited green spaces. But people in Kwajalein did strongly emphasise the value of community and social and cultural activities,

saying they valued living in a safe community where people worked together in a respectful and caring way and where traditional values were at the centre of how the community worked together.

The final value identified was having an 'easy life'. Community members spoke about how their lives were relatively easy, with low costs of living, ease of movement, and able to access natural resources to support their households.

Analysis of the Day in the Life Survey data confirms that place-based processes and institutions dominate people's lived values (Figure 2). People say that they value their families and friends, and indeed their behaviours as observed and recorded confirm this. They also say that they value their island environments and the resources they provide for their health and well-being, and men in rural islands and atolls spend considerable time on food procurement activities such as fishing harvesting, gardening, and tending to livestock (women are responsible for food preparation). Related to this, rural people in particular appreciate the autonomy that comes from access to the natural resources to which they have rights, which they say gives them freedoms and an easier life, at least as compared to people living in the United States. Church and religion are also very important, and here too people's behaviours confirm this, with most people reporting that they pray daily, and attend church at least once a week. People also say they value their local communities, though there was frequent discussion of the way climate change is increasing competition among people for scarce resources (as well as for 'adaptation' type projects), and the negative effects of migration on those left behind.

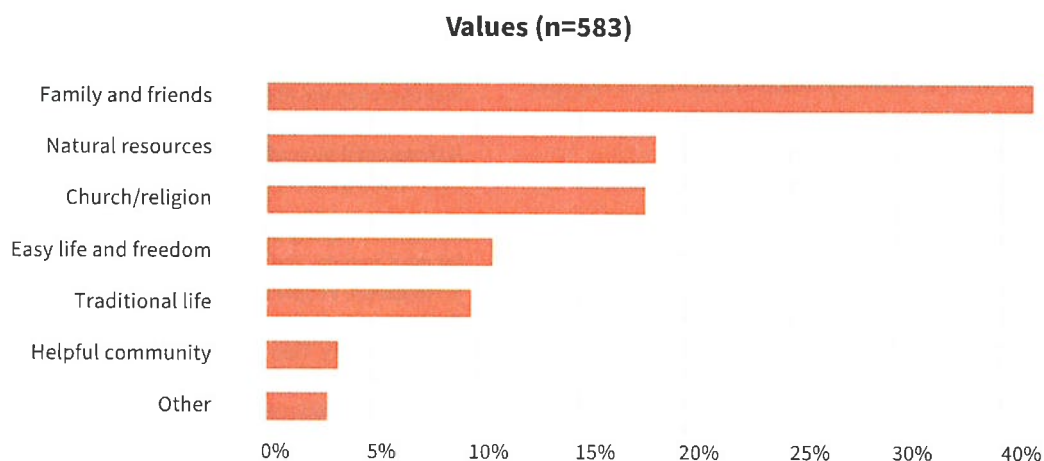


Figure 2: Values as reported in the Day in the Life Survey

Peoples affected by nuclear testing showed some different lived values. In Mejjatto local songs have been composed by the community members to recount not only traditional stories from their former homeland of Rongelap (from which they have been displaced by radiation from nuclear testing), and to remember the displacement and journey of the people since that testing. These people hold particularly tight to their unique shared identity and heritage. Nuclear testing has also left an indelible imprint on the lives of people in Kili and Utrik. In Utrik people face a multitude of health issues arising from radioactive contamination of their lands - during the site visit almost all participants indicated having a family member who had suffered some form of cancer. In Kili some daily practices that were traditional in Bikini are no longer possible - most notable among these is fishing given the seas around the island are rough and rarely safe for small boats.

4.3. Conclusion: why adapt?

These values are relevant to adaptation in that they demonstrate the community's aspirations to continue living in their homelands, which is sustained by their access to place-based natural resources. The data shows that communities value a supportive network with others who share their values and traditions, and that they highly value land tenure and access to natural resources. These factors are key to their sense of place and security. They provide insight into how people's sense of community might be disrupted due to climate change or due to adaptation processes, and they strongly underscore the need for adaptation solutions that enable people to remain living in their homelands and communities. These responses are entirely consistent with the state goals of the Government of the RMI, whose 2020 Adaptation Communication to the UNFCCC stated the key principles for its adaptation activities, including the natural, inalienable right for people to remain on their islands, and the importance of security, well-being, identity, self-determination, human rights, and survival.

5. Observations of climate change

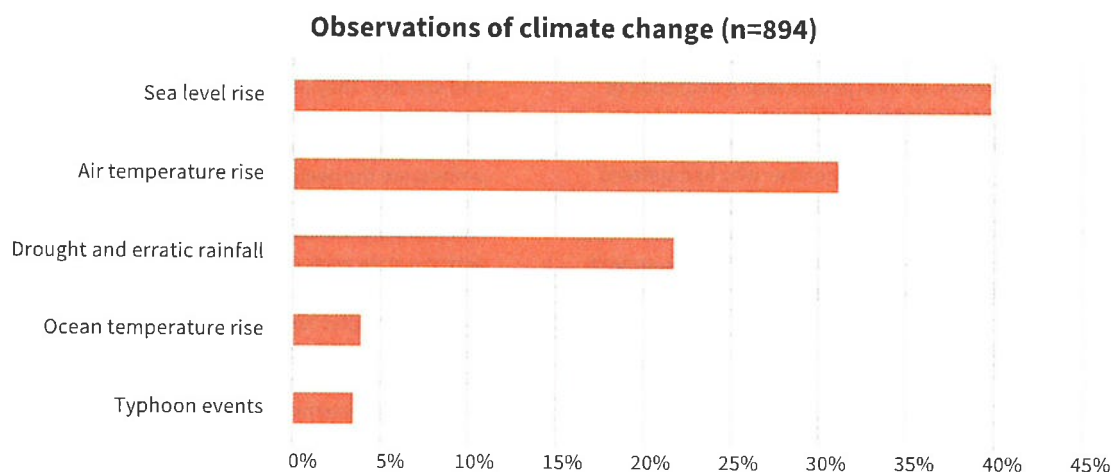


Figure 3: Most frequent observations of climate change (Day in the Life Survey)

5.1. Introduction

Understanding local people's observations of changes in climate and their environment is important for several reasons. First, it helps improve scientific understanding of climate change's impacts across the RMI given the absence of instrumental records beyond Majuro and Kwajalein. Second, such observations can serve as the basis for monitoring changes that are relevant to people, and as a basis for communities and schools to learn about climate impacts and adaptation strategies. Finally, such observations are the first step in understanding what climatic changes are important to people, and so that adaptation responses that meet local needs can be developed.

5.2. Observations of climate change

Across all respondents the main observations of environmental change that are consistent with climate change projections are, in order of importance: rising sea-levels, increasing air temperatures, drought and more erratic rainfall, and then, to a much lesser extent, observations of increased ocean temperature, and changes in typhoons (see [Figure 3](#)). The impacts of these changes on people's lives are described in section 5.

Sea-level rise was the main observation of the majority of respondents to the Day in the Life Survey (40%), and it was also the most frequently mentioned observation in interviews. Sea-level rise was reported in all islands, though its relative importance varied from island to island (see below). Women were slightly more likely to report observations of sea-level rise than men (see [Figure 4](#)), and fishermen and youth frequently mentioned it in interviews. There is little doubt that people are observing sea-level rise in the RMI, with one respondent saying that now "*the sea level and land are exactly the same height*". Many people observed that high tides were more frequent, and that sea levels were higher during king tides.

Air temperatures were also said to be hotter than in the past, and approximately 31% of all respondents to the Day in the Life Survey identified this change. Higher air temperatures were the second most frequently mentioned change in the interviews. Air temperatures were described as "*more intense*", "*overwhelming*", "*unbearable*" and "*scorching*". More women than men mentioned hotter air temperatures in the Day in the Life Survey (see [figure 4](#)), and most of the comments about it made in interviews came from women.

Linked to the problem of increased air temperatures was the problem of drought arising from more erratic rainfall, which was mentioned by 22% of respondents to the Day in the Life Survey. This was the third most discussed

change in the interviews. People said “there has been a constant drought over the years”, “everything is dry” and “when it rains it doesn’t now, it contains only a small percentage of precipitation”. Men were much more likely than women to report an increase in drought and rainfall, because men are responsible for harvesting tree crops, gardening, and maintaining livestock, where the effects of drought are most felt. Men also spend more time than women on the land and so observe changes in vegetation more often than women. A consequence of less rain and drought is increasing dust, which was reported on many islands. In general people in the Northern islands were more likely to observe drought than those in the Southern islands, which is consistent with past studies and experience. Nevertheless, drought was also frequently observed in the southern islands of Ebon and Jaluit.

Approximately 4% of respondents to the Day in the Life Survey reported that ocean temperatures were also rising. These observations mostly came from fishermen who reported associated changes such as stronger currents, coral bleaching, and coral and fish migration to deeper and/or cooler waters. A similar number of people suggested changes in typhoons, though this was reported in only a few atolls and islands, and was always in reference to a past typhoon that was said to be particularly bad.

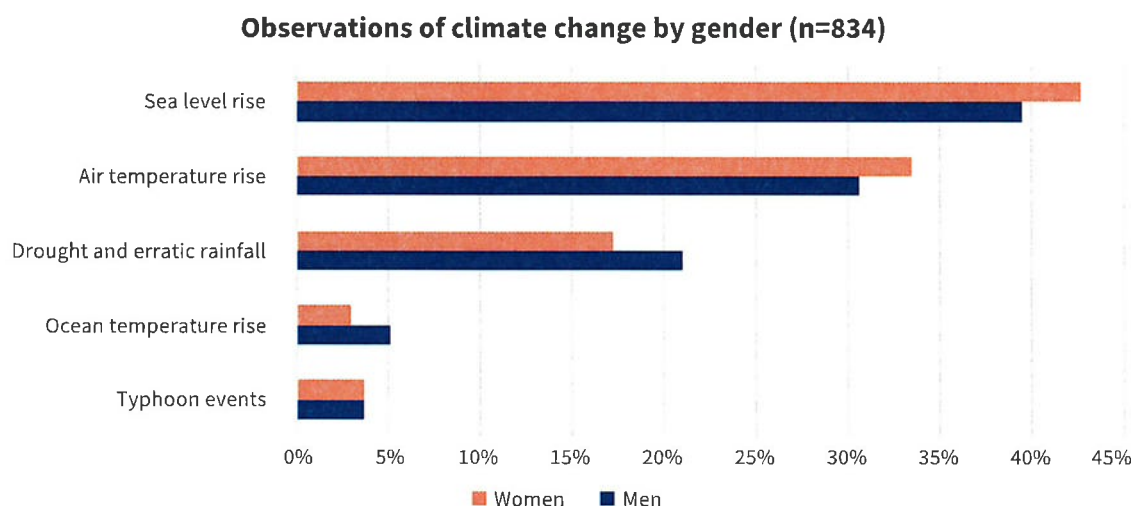


Figure 4: Most frequent observations of climate change by gender (Day in the Life Survey)

While the main changes of higher sea-levels, increasing air temperatures and drought were observed in all islands, the relative frequency of the observations differed from island to island. Notable exceptions are the very high frequency of observations about sea-level rise in Enewetak, which is arguably because this risk is highly salient and valent given concern about radioactive materials leaching from the nearby Runit dome due to rising sea-levels. In Kili, too, sea-level rise was a major concern with 91% of respondents mentioning it (Kili is reportedly the lowest-lying island in the RMI). The problem of heat was most frequently observed in Kwajalein and Majuro, probably because of the higher density of buildings there, but also because other problems such as drought were unlikely to be noticed given few people harvest their foods from the environment. Higher ocean temperatures were not recorded in all islands, but were particularly noticed in Ebon and Ujae. For detail on observations of climate change within each of the atolls and islands, refer to the Community Summary Reports in the Appendices.

5.3. Conclusions

People across the RMI are observing changes in their environments that are consistent with those projected to arise from climate change, including rising sea-levels, increasing air temperatures, and increasing drought and more erratic rainfall. These observations have been made in every island, and by women, men, and youth. As the following section explains, these changes in environmental conditions are impacting on people’s well-being in important ways.

6. Social impacts of climate change

6.1. Introduction

Understanding how climate change affects people's lives is key to developing adaptation responses that meet local needs. It is also key to enabling adaptation responses, which requires that climate change be both a salient (noticeable) and a valent (emotionally experienced) issue. As this section explains, climate change is both salient and valent for people in the RMI, as it is negatively affecting peoples' lives, and causing anxiety about the future.

6.2. The social impacts of climate change

The main observed changes in sea-levels, air temperature, and rainfall are having myriad effects on people's lives in the RMI. Participants readily identified how changes in the physical environment were affecting their day to day lives. In the words of one respondent:

"I was born and raised here. The changes I've seen from the effects of climate change are very disturbing. The pandanus won't even be ripe yet and half of the fruit will fall out. It wouldn't be harvest season yet the colour of the fruit changes. The wells don't have that much water anymore. There's a lot of coastal erosion. We wonder why we have to go out so far in the ocean to fish and we hear that it's because the heat is making the fish go into deeper, cooler waters"

6.2.1. Impacts on livelihoods

The most frequently mentioned impact in the Day in the Life Survey was on livelihoods, with a third of all respondents saying that climate change undermined their ability to meet their needs (Figure 5). The category of 'livelihoods' encompasses all the activities that secure a means of living, be they from subsistence activities or the sale of goods, services, or labour. More men than women reported impacts on livelihoods (Figure 6) because they are responsible for more of those aspects of households that depend on climate-sensitive natural resources. However, as explained below, the consequences of these impacts on livelihoods are felt more acutely by women.

Climate change is impacting on the production of goods that people sell. In many of the islands where copra is produced and sold, income from production was said to be falling due to increasing heat and salinisation of soils reducing production of coconuts, and because the time it takes for the supply of nuts to recover after droughts has increased as droughts have become more intense. These problems were reported in Ailinlaplap, Ailuk, Arno, Mejato and Wotho.

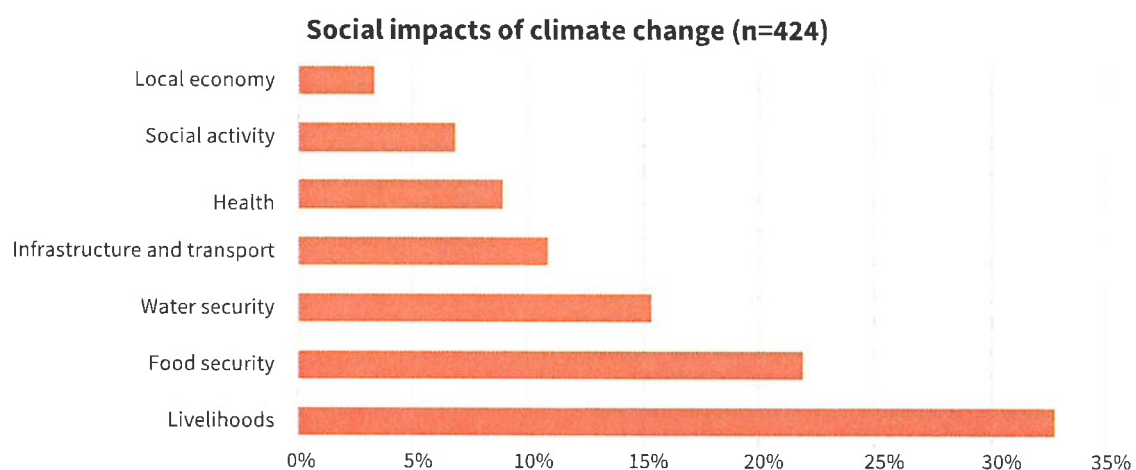


Figure 5: Most frequent mentioned impacts of climate change (Day in the Life Survey)

Women across the RMI earn income from the production and sale of handicrafts (*amimono*). In every island where this is the case women reported that droughts and sea-level rise also affecting some of the species that are used to make handicrafts, such as copra and pandanus, and shells harvested from the shore. Women reported needing to travel further to collect these materials. The problem of supply was compounded by the increasing challenge of accessing these resources due to greater heat: many women said the weather was now too hot during the day for copra harvesting or shell collection and must now be done in the evening (from 4pm onwards), which is also when they are expected to care for children and prepare the evening meal. The combined effect of these changes is that fewer handicrafts are produced, some are no longer made, women's incomes have fallen, and for women "*life is getting harder*" and they face exhaustion from daily chores and family commitments. This in turn is increasing conflict within households (see below).

Changes in the marine environment are also affecting livelihoods. For example, fishers in almost all atolls and islands reported increasing challenges catching fish, with falling catches and/or increasing effort per unit. The degradation of reefs, a decrease in fish in nearby warmer waters, migration of species to deeper and cooler waters, and less predictable fish behaviour have all meant fishers are catching less near to shore and must go further to catch fish. This has increased the demand for boats, and with rising fuel costs (US\$12 a gallon at the time of the consultation) fishing has become more costly. Concerns were also raised about the safety implications of this, especially given seas are thought to now be rougher and less predictable seas. In Jaluit and Likiep changes in tides, sea-levels and waves have made harvesting of clams more dangerous, and it has also made travel to islands within the atolls

to harvest clams and other resources more difficult.

These changes, and the reduced supply of food from plants (see below) mean that communities are now more reliant on imports to meet their food needs at the same time as income to purchase foods is reduced by diminished sales of copra, fish and handicrafts. Many households are struggling to buy what they need, which is significantly exacerbated by supply-side constraints associated with limited shipping and markets, for example a 20lb bag of flour is \$40 in some islands.

6.2.2. Impacts on food Security

Closely linked to the impacts of climate change on livelihoods is its impact on food security. Food security is the reliability of access to enough nutritious food, either from subsistence activities, transfers from family and friends, or purchases. Food security was the second most frequently mentioned area of impact in the Day in the Life Survey, with close to a quarter of respondents identifying this as a concern. Here, too, men more than women reported food security as a concern, again because in most households much food is supplied from the local environment and this is the responsibility of men.

The impacts of climate change on the supply and effort to catch fish was discussed in the previous discussion on livelihoods. The other main impact on food security, reported across all islands and atolls, was on the supply of food from crops. Increasing heat, decreasing and more variable rainfall, and increasing salinity of soils and groundwater from incursions of sea-water are all said to be reducing the health and yield of key food crops such as bananas, breadfruit, coconuts, limes, pandanus, swamp taro, tomatoes and watermelon.

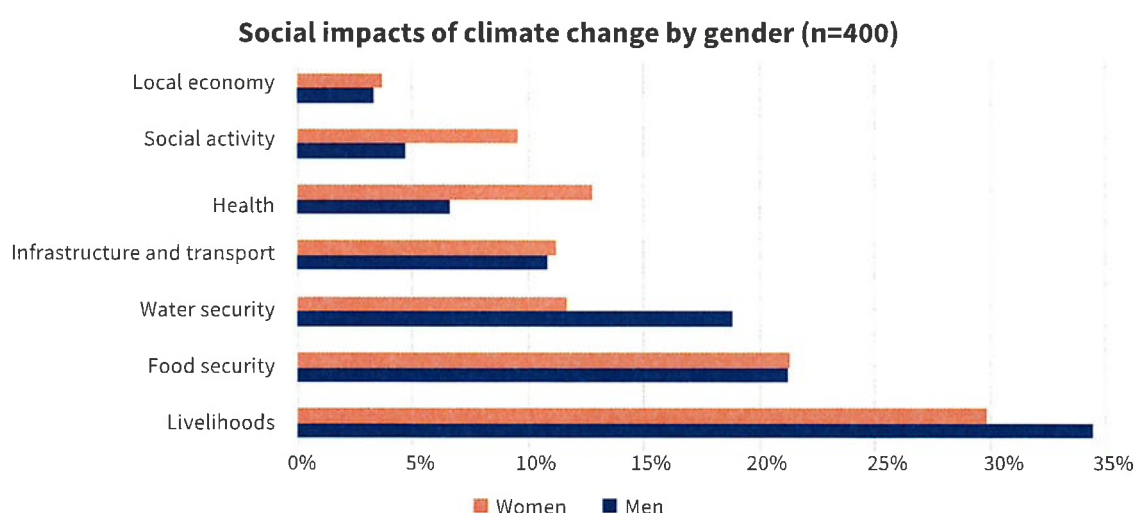


Figure 6: Most frequent mentioned impacts of climate change by gender (Day in the Life Survey)

In Ailuk people said the traditional crop of tapioca can no longer be grown. People in Wotho expressed particular concern about reduced yields of breadfruit, which they say ripens up to 2 months earlier than usual in dry years. Many people observed problems with the fruit itself, saying it is smaller, decayed, and rots quickly once harvested. People (especially women) in Enewetak report grave concerns about the health implications of consuming marine species given their fears of sea-level rise causing greater contamination from radiation leached from the Runit dome, and the absence of monitoring for this.

Women and men reported that it now takes more time and effort to access traditional crops. Increasing heat also means people spend less time harvesting and planting crops in the middle of the day. As discussed above, these impacts on local foods mean households have to spend more on imported foods, whose prices are high and supply is unpredictable due to constraints in transport and a lack of competition among vendors. These imported foods are also less nutritious substitutes for fresh traditional foods, and this may be a secondary driver of increasing health problems (reported below).

6.2.3. Impacts on water security

Heat and drought are causing widespread impacts on the reliable supply of sufficient quantities of safe water for human consumption (water security). This problem was reported across almost all islands, and by 15% of respondents to the Day in the Life Survey. It was reported more by men than women (see [Figure 6](#)), although it should be noted that it is the major cause of health impacts (discussed below), which was a much more important concern to women than men.

Few of the atolls and islands consulted relied solely on ground water and rainwater harvesting for all their water needs. Most relied on reverse osmosis units to meet some of their water needs, and where these were functioning and well-maintained water security was a lesser concern. Some islands had notably acute water security challenges. In Wotje, for example, participants said they had resorted to drinking well water, which is typically used for cleaning only, and for drinking only as last resort due to safety concerns and increasing salinisation. Salinisation of ground water was commonly reported, including in Wotho where there are 14 wells that are increasingly contaminated by salt water due to sea-level rise and reduced rainfall. In Kwajalein salination of groundwater, drought, and supply problems in Ebeye were leading to people going thirsty, with people saying *“we end up having to bathe with the freshwater we buy because the water coming out of our showers is saltwater”*.

6.2.4. Impacts on infrastructure

People in the RMI do not have good access to infrastructure, though systematic data about this is absent. Power and water supply is everywhere unreliable and in Ebeye and most rural islands insufficient to meet needs. Transport services are extremely infrequent and expensive, this is true for travel into and out of the country and between islands, and in some cases such as Enewetak transport is very scarce and expensive. Access to boats to travel within atolls is also limited. Waste management is limited, especially in rural islands, and services are insufficient in Kwajalein and Majuro. Access to the internet is limited to one or two computers in most rural islands. In many islands school facilities are limited and in poor condition, and health services are limited, again especially in rural islands. These infrastructure problems significantly constrain economic and human development in the RMI, they limit the flow of information and people necessary for effective governance, and they significantly restrict the choices people have to adapt to climate change. Moreover, the limited infrastructure that does exist is now being impacted by climate change.

In many islands roads and houses were reported to be damaged by flooding during high tides – with water coming both over the coast and also rising from the ground, including in Ailinglaplap, Majuro, Wotho, and Wotje. In Kwajalein and Majuro salinity and flooding damage houses and rainwater tanks (58% of households in Majuro Atoll get their drinking water from rainwater tanks), and flooding and salinity have damaged powerlines leading to electricity cuts for several days. Typhoons have in the past caused significant damage to houses, food plants and livestock in Enewetak and to housing, roads, seawalls and power lines in Kwajalein.

The docks in Ailinglaplap and Arno have been progressively destroyed through successive high tide events, so much so that the dock in Ailinglaplap is no longer in use, and people now load and offload goods off the shore, which is more time consuming and the same in almost all other rural communities.



Figure 7: Over 6 feet of erosion on Aikne Island on Likiep

Roads are being damaged by erosion, including in Ailinglaplap, Ebon, Likiep (see [Figure 7](#)), Ujae and Wotho. In many islands the road that is being damaged is the one that leads to the airport, and in Kili and Wotho there is episodic flooding of the airstrip itself. Rates of erosion are high, for example in Ebon there has been more than 3 feet of coastal land lost in the past 10 years. Erosion has destroyed graves in Arno and in Majuro, and in Majuro erosion is a threat to Laura beach, which is one of the few places where children can swim.

Flooding restricts people's access to key services, for example youth reported in Ajeltake-Laura in Majuro and in Wotje that flooding events can make it difficult to walk to school. In Kwajalein water shortages and flooding both cause schools to close. The impacts of flooding on mobility are more pronounced for people with physical and mental disabilities, who often lack support to move around when there are high tides and floods.



Figure 8: Impacts on infrastructure in Wotho

Schools themselves were said to be at risk from erosion and flooding, including in Wotje and Enewetak. In Enewetak women in particular were concerned about the safety of school children during typhoons given the school is close to sea-level, and on the northern side of the island where typhoons do most damage. A teacher in Mejjatto reported that students received unexpectedly low scores on their MISAT results because testing was conducted at 1pm on a very hot and sunny day, and that *"It doesn't help that the school doesn't catch any of the wind and there is only an aluminium roof with no ceiling. So it felt like an oven."*

6.2.5. Impacts on health

Health impacts from climate change were also reported in most islands, and particularly by women who bear the burden of caring for those who are unwell. These impacts are driven primarily by high air temperatures and water scarcity, but are exacerbated by extremely limited health services, especially in rural atolls and islands.

In many islands, participants explained how higher temperatures and drought were impacting their health: dust in the air caused by low rainfall has increased cases of eye infections, dust also ends up in the water tanks and contaminates drinking water that is already scarce; a lack of good drinking water has increased cases of diarrhoea (including among children), especially when people try to save water by not washing their

hands; and participants described higher rates of heat stress, with people reporting feeling dizzy and weak. These problems were pronounced in Ailuk, Ailinglaplap, Arno, Enewetak, Kwajalein, Wotje and Wotho.

In Ailinglaplap people reported increased cases of fish poisoning (ciguatera). In Enewetak women and youth expressed concern about the safety of eating local sea foods given the risk of contamination from the Runit dome. In Kwajalein a couple of participants explained that people get sick because of poor nutrition, and heat and water scarcity meant there were cases of dehydration. In Majuro high tides create unhygienic conditions because of their effect on the sewerage system, and they disperse rubbish and increasing mosquitoes. These events often result in outbreaks of vector-borne diseases (e.g. dengue, chikungunya, Zika virus) that can spread to the rest of the country, causing fatalities and having high costs to public health.

Climate change is also having a significant impact on mental health because it is increasing levels of stress in people's lives, and the idea of future changes is also a cause of distress (see below). Women in particular reported increasing stress, as they are responsible for preparing food, and are increasingly expected to contribute financially to households, which most do through making and selling handicrafts. As explained above, heat and drought reduces their ability to make handicrafts, meaning they must work harder and/or earn less, and the increasing health burden of climate change is borne by women who are also responsible for the care of the sick, children, and the elderly.

There is evidence to suggest that women are increasingly worried about the consequences if they are unable to meet the expectations made of them. A few respondents linked increased instances of domestic abuse and gender-based violence to climate change pressures. Women are blamed for not being able to provide for their families, and they said they were resented by male heads of families when they run out of raw materials to make handicrafts.

“There is a lot of trauma and stress [among heads of households] caused by not being able to provide for their families. These stressors result in social issues such as domestic violence and substance abuse.”

Women also pointed out that there are not enough spaces for women to get together and collaborate, and that social isolation is increasing due to heat. This in turn increases opportunities for domestic violence.

6.2.6. Impacts on social life

The final main social impact reported during the consultations was on social life. This was a concern raised by women much more than men (see [Figure 6](#)), because women are much more responsible for social reproduction, and social isolation has more significant consequences for the mental and physical health of women (as explained above).

The main cause of decreasing social interactions was said to be heat, which is forcing people to spend more time inside, and so spend less time not socialising and exercising. This impact of heat was reported across many islands. These comments highlight how the daily patterns of life are beginning to shift due to climate change.

This problem of isolation is compounded by increasing tensions within some communities over scarce resources. For example some people in Wotje commented on growing competition for seed stock and water resources, in Jaluit community members are experiencing conflicts and tension between other families and communities as resources become scarce, and in Ailuk less income and a negative impact on livelihoods is causing some land disputes. These tensions are projected to increase in the future with further climate impacts and erosion of land. As one participant said:

“I can see the change through the social climate amongst the community. It used to be so peaceful and the atmosphere amongst the people was calm. Now there's more hatred and social isolation in the community. They don't take care of their siblings and they're arguing over land now. You can tell everything is starting to change”

There is also a risk of increasing conflict around climate change adaptation projects too, especially when these do not respond to local needs. One respondent said, for example, that “there seems to be more and more visitors and experts coming into Ebon to tell us what to do. How come they keep telling us what we need instead of listening to us?”. There is an increase in people visiting some islands with a view to ‘consulting’ on adaptation projects, and when these consultations, and the design or delivery processes look to favour some groups over others then this can lead to increasing tensions within families, thereby undermining the collective action that is otherwise one of the key strengths of Marshallese communities.

6.3. Concern about future impacts

The main concern about the future expressed by people was its effect on social cohesion. Many thought that there would be increasing conflict among families over access to land and fresh water, and tensions over land ownership arising from the need to relocate houses and other infrastructure to safer areas within the island.

Other concerns about future impacts included increased sicknesses arising from heat, loss of land due to erosion, increasing damage to infrastructure, difficulty accessing food and fresh water, and the potential increase of outmigration in response to climatic impacts. Given that handicrafts are such an important part of life, people expressed fear that droughts, sea level rise and heat could spell the end of the handicraft industry. People in Enewetak are very worried about sea-level rise given the risk of greater contamination from the Runit dome.

For the most part respondents to the Day in the Life Survey considered many of the same impacts today would persist into the future but become more intense. The only significant difference between present day impacts and concern about future impacts was that many respondents thought sea-level rise would be an ever-greater problem in the future. This may be for two reasons, firstly because they were asked about future challenges immediately after a presentation about future impacts, including information that there would be 7.5 feet of sea-level rise by 2150, so it stands to reason that sea-level rise was at the forefront of their thinking when discussing their future lives (noting that less than 1% said they would migrate – see [Figure 9](#)). Second, it may also be that whereas respondents had many good ideas about how to adapt to avoid sustain their livelihoods and food and water insecurity, they had far fewer ideas about how to adapt to sea-level rise, and so may feel more anxious about this risk in particular. Certainly, as shown below, current adaptation responses are mostly focussed on coping with drought rather than on adapting to sea-level rise.

6.4. Conclusions

Climate change is having widespread and significant impacts on people's lives in the RMI. Increasing heat, drought, and sea-level rise are undermining livelihoods, causing food and water insecurity, damaging infrastructure, increasing illness, and diminishing social interactions. There is damage to infrastructure and crops, and there are losses of health, land, and social opportunities. These impacts will amplify as emissions increase, and if there is no adaptation to help avert or minimise them. They are exacerbated by several social and economic conditions that make people more sensitive and less able to adapt to avoid these impacts on their lives. Some of the main co-drivers of impacts are discussed below.

7. Co-drivers of climate impacts

7.1. Introduction

People in the RMI recognise that climate change is by no means the sole driver of the deterioration in their livelihoods and health. This is consistent with the understanding in climate change research that vulnerability is a function of: exposure to climate risks, which is mostly a function of where people live; sensitivity to changes in environmental conditions, which is mostly a function of the degree to which livelihoods depend on climate sensitive resources; and capacity to take actions to reduce their exposure and sensitivity (called 'adaptive capacity'), which is a function of social freedoms and opportunities.

People who are exposed and sensitive to climate change and have few options to adapt are more likely to suffer from climate change. The evidence from the consultations shows that most people in the RMI are highly exposed and sensitive to climate change, and have few adaptation options, and this is partly a function of living in atoll environments, and partly a function of the economic, social, and political institutions that govern their lives. This section provides evidence drawn from the consultation and analysis of background documents to explain the main co-drivers of vulnerability in the RMI.

7.2. Key co-drivers of climate impacts

As explained earlier, infrastructure in the RMI is not well developed. This increases people's vulnerability to climate change in myriad ways. Many rural people's problems could be reduced by more frequent and/or cheaper shipping and air services to Majuro. This would improve the sale of commodities such as fish and handicrafts to Majuro, as well as increase the frequency of payments for copra. It may also open new markets for rural goods and services that rely on reliable transport, including for fresh produce, pearls, and tourism, which would increase wealth and help diversify livelihoods. The present lack of services means people have limited access to goods and services, including spare parts to maintain critical infrastructure such reverse osmosis units and solar power systems, and to the equipment and services necessary to adapt food production to increasing dryness and drought. It also increases shipping costs which leads to high prices for key commodities like fuel and flour.

At a smaller scale transport within atolls is constrained by access to boats, and by rising fuel prices. Traditionally

people utilised canoes to travel to many islands in an atoll to access water and food, and to fish in diverse locations inside and outside of the lagoon. Nowadays the stock of canoes and small boats for these purposes is much diminished, and this constrains the mobility that had traditionally sustained livelihoods. This is because canoes are typically made from breadfruit trees, and there are not enough that can now be spared from food supply to make canoes. The alternative - motor boats - are expensive and the cost of fuel is prohibitive. In the absence of canoes and boats people to rely on nearby lands and fishing grounds, which can lead to overexploitation of resources in those sites.

According to the 2021 census, less than 2% of the population of the RMI have regular access to the internet, and it is for all intents and purposes not accessible outside of Kwajalein and Majuro. This limits the provision of education, financial services, information about government services and policies, healthcare, and information about current affairs including climate change. This in turn drives migration as people leave to seek better access to education, healthcare, job, and social opportunities. Remoteness also limits the provision of technical support for adaptation in sectors like agriculture, fisheries, and water resources.

Poor transport and ICT also creates governance problems. Elected members of islands cannot move freely between their islands and the seat of government in Majuro and so must either remain in their islands, where they cannot influence decisions in Majuro, or remain in Majuro where they are seen to be removed from the daily concerns of their constituents. Nor can this situation be resolved through communications between Majuro and rural islands, for this is not easily or cheaply done given the poor state of ICT. This in turn creates tensions both between elected officials and local people, and more generally between the government and local people. The problem works at a larger level too, since the costs of travel between the RMI and the United States limits trade in goods and services between the two countries and constrains the movement of people necessary for more effective implementation of projects and programs between the two countries.

Energy and water infrastructure is also inadequate, leading to a lack of cooling and water scarcity. In many islands water supply systems were inadequate but could be improved simply by improving training and the supply of spare parts for maintenance (which is constrained by deficiencies in transport and ICT). In

other islands investment in new water supply systems is needed. Health impacts were reported far more in Kwajalein compared to the other atolls because of power and water supply challenges, as well as poor sanitation and waste management issues.

Housing, too, is a cause of increased vulnerability to climate impacts. Many houses and public buildings are poorly ventilated, prone to flooding, and located in hazardous coastal areas. Both the design of houses, and their location, may need to change, but there are no regulations to govern the design and location of new houses and public buildings, the cost of new housing is prohibitive, and relocation to safer areas raises complex challenges with land tenure. Housing problems were particularly acute in Ebeye, where participants said they were living in cramped conditions, with no running water or access to electricity. One participant expressed frustration that they had not received support to replace their house which was lost during a storm, raising the need for social protection institutions that can assist with livelihood support during disasters, and recovery of lost or damaged assets.

There are problems with access to land that also increase vulnerability. Traditional owners of land are few, whereas demand for their land is high, especially in crowded urban areas such as Ebeye and Majuro, leading to inequities in access. As one respondent in Ebeye said: *“It’s too small, we piggyback on other relatives just so we can have a place to stay, and it gets overcrowded at times.... they promised us homes, but never came through with their end of the deal”*.

For some other communities traditional lands are no longer available for historical (colonial) reasons, including people in Likiep whose lands were transferred to two families under colonial times, people from Bikini and Rongelap whose lands cannot be occupied due to nuclear testing and who are now effectively tenants on someone else’s land (in Kili and Mejjatto respectively), and people from Enewetak who have lost land due to the stockpiling of radioactive material on Runit island.

Access to basic health care and medicines is extremely limited in the RMI, especially beyond Majuro. Medical professionals in rural atolls and islands are typically limited to medical assistants, many clinics are small and not well equipped, and medicines are scarce. The legacy of nuclear testing on public health also remains a concern, and was noticeable in Utrik. The lack of medical services increases people’s vulnerability to diseases, including those linked to climate change such as pink-eye and diarrhoea. It also means that people who need more specialised health services migrate to those services and cannot easily return given the limited and expensive transport connections. As one respondent from Ebon said: *“when someone gets sick, we must wait for the Doctor on Toka to come, and when the tide is low, he cannot cross*

the lagoon even if it’s an emergency. I am tired of telling visitors and experts the same thing, we need a doctor, we need a better airport but nope, they come back with totally different ideas of development than what we need”.

The concerns raised by women about the relationship between climate change and domestic violence occur in the context of existing problems with domestic violence. Consultation with women revealed that domestic violence was a problem in most communities. This is very much a problem of masculinity in the RMI. It is also a function of the gendered division of labour which sees women responsible for time consuming domestic tasks, of the lack of adequate support for women from the justice system, and inadequate infrastructure and services that mean women remain relatively isolated and have few safe spaces. In the consultations women on many islands proposed changes to promote gender equality and to protect those most at risk. There were also proposals for purpose-built disaster shelters stocked with emergency provisions (including sanitary products) that can also be used as refuges and meeting places for women.

One factor that does not seem to increase vulnerability is a lack of awareness of climate change. In many communities people had little understanding of climate change science, but nevertheless had a very good understanding of the changes they were seeing in their local environments and what can be done to manage them. For example, in Enewetak and Wotho it was observed that the community was able to observe and understand the changes in their environment and the threats these pose, and to identify adaptation responses, despite little to no knowledge of the issue of climate change. Awareness of the risks of climate change clearly is not needed for people to understand its impacts and take some actions: what is needed, however, is greater education and information about potential adaptation responses, particularly with respect to adaptation to sea-level rise.

7.3. Conclusions

A ‘development first’ approach to adaptation involves addressing all of the factors that increase vulnerability to climate change, even if these at first do not seem to be directly related to climate change (see section 2). Some of the co-drivers of climate vulnerability in the RMI are powerful causes of disadvantage and inequity, and can be solved using policies, programs, practices, and technologies that have been demonstrated to be effective in other countries. Addressing these co-drivers would have significant co-benefits in overcoming poverty and disadvantage and would at the same time reduce vulnerability to climate change by reducing people’s exposure and sensitivity and enhancing their freedoms and opportunities to adapt.

8. Coping and adapting

8.1. Introduction

The consultation process collected information about what actions communities are taking to try and avert or minimise the impacts of climate change. Many of these actions are coping responses rather than adaptations, because in many ways they minimise or delay climate impacts, but often do not avoid them. They are nevertheless significant as they demonstrate that the climate impacts people in the RMI are experiencing are important enough to warrant investments of their limited resources, that they do indeed have capacity to respond, and that there are actions already underway that can be greatly supported by governments and the international community.

People were also asked for their ideas about how to adapt in the future. It is important to note here that peoples' ideas are not the same as their preferences from the full set of possible adaptation options. People in the RMI have not been informed about potential adaptation options. This means that people looking to support adaptation actions should not assume that the ideas people presented in this section are all that needs to be done, since there are many possible further actions that people did not know of and so did not mention (some are discussed in section 9). Knowing what people's ideas about future adaptations is nevertheless important as it is strongly indicative of the risks they find important and a good guide to the options that could be explored further with communities (see section 9).

8.2. Current responses

Communities across the RMI have few means to adapt. As explained above, infrastructure is poor, information is scarce, and incomes are low. The scope of existing responses is therefore similarly small in scale, and in most cases funded by households and communities, using their own labour and local resources.

"I attended a coral replanting training in 2011 but there was not enough manpower to sustain the project... I repaired old concrete water tanks near my house, and they are being used. I am making compost, stopped burning waste and have started replanting my village"

Most responses involved actions to support food security. For example, participants reported replanting pandanus and breadfruit trees, and used composting to support tree crops. In Aerok (Ailinglaplap) the community has started replanting tree crops across the island to increase local food sources as well as increase natural resources for handicrafts. In Mejjatto, the Climate Security in the Pacific project has implemented solar-run vertical aeroponic gardens - a climate-smart agriculture technology that will allow the community to grow short-term crops. In many islands people resort to purchasing more imported foods which are less fresh and less nutritious, and place stress on family finances and in turn on gender relations. At times government food relief is supplied when food production is low, as was the case in Wotho in 2016. In Ailuk people selectively plant and harvest ahead of drought periods, and some of the uninhabited islets are used for this purpose. Further, traditional food preparation of crops such as breadfruit and pandanus allows for extended storage to guarantee food security. In Enewetak when local food crops fail people travel to Ujelang to get fresh food, which is a two-day trip. The men in Aerok have started to fish in large groups to catch fish for the entire community.

Responses to maintain water security mainly involve the use of reverse osmosis units, and in addition water treatment plants operate in Ebeye and Majuro. In most islands, when rainfall and/or supply from reverse osmosis is insufficient people shift to using rainwater for drinking and groundwater for non-consumptive uses, and finally they shift to groundwater for consumption as well (groundwater requires boiling and/or filtering first). In Arno communal wells have been built to provide better access to water. In cases where reverse osmosis units do not work well, and drought is severe, none of these options suffice, and this is when health problems arise. In Kwajalein when public water supplies are inadequate people often buy water for those who cannot afford to. The people of Ailuk reported sharing their water supplies with neighbours. In Enewetak rationing of water is common, and at times clean water must be imported from Majuro.

In addition to these food and water security measures, some participants engaged in coastal protection measures such as small homemade sea walls to protect houses, roads, and community facilities such as schools. In Enewetak and Wotho people have planted pandanus and pine trees to try and stabilise shorelines and break wind and wave energy during storms. In a few instances people have used palm fronds and other vegetation to try and prevent erosion of sand.

"We built a seawall and mini water sewer on the side of the roads. My family got together and worked it out, that's what I value most about being a Marshallese."

Respondents from Majuro and Ebeye pointed to existing sea walls as examples of adaptation, though people in Ebeye people said that construction had been stalled and that the sea-wall did not protect against inundation from the lagoon. There are also examples of coral reef conservation.

Some technologies, when they work, are effective. For example, reverse osmosis units work when they are maintained and functioning at full capacity, as is the case in Utrik, for example. Air conditioners are widely used in Kili to keep houses cool, but people are now very dependent on these and recent electricity shortages have now led to problems with heat.

Many people pointed to the ways in which communities act collectively to solve shared challenges, and that "work together" and social cohesion are key assets for and enablers of adaptation. For example, community-organized clean-up days are common, including in Majuro, demonstrating both that communities can act collectively, and that public waste management systems are inadequate. In Arno people said that community members shelter those whose homes have been damaged, and work together to help people rebuild after disasters. In Ailinglaplap and Ebadon participants said that they use their schools and churches as safe spaces for sheltering during extreme weather events.

8.3. Ideas about future adaptation practices

People across the RMI tended to express nuanced thinking about how to adapt to climate change. The most frequently heard message across all communities was a very strong determination to work collectively, to 'prepare', 'plan ahead', and to work with governments to adapt. Statements to this effect were reported in all methods across all communities, for example:

"My aspiration is to see a future where everyone can work together to come up with solutions for our country to address issues like climate change impacts (sea level rise, king tides, etc), corruption, land issues, have better medical care, better educational opportunities, and more."

"There is no more time to be ignorant because, even in a small island like ours, we cannot ignore the immense changes, most of which are not encouraging. To build resilience, we need to harmonize not just with nature but with each other."

In terms of technological interventions, coastal protection and in particular sea walls dominated the discussion (see [Figure 9](#)). The frequency of mentions of coastal protection roughly corresponds to the salience and valence of coastal change problems, for example all people in Kili expressed a strong sense of urgency regarding the implementation of coastal adaptation measures to reduce further inundation. Seawalls are a known response to coastal flooding and erosion, and almost all respondents would have seen them in Ebeye or Majuro. Some Majuro Atoll residents would like to more seawalls, especially on the ocean side of Jenrok and in the northern islets where erosion is perceived to be higher.

Seawalls dominated the discussion in the Day in Life activity (as per [Figure 9](#)) and this finding is likely shaped by the consultation method. The question on adaptation ideas came immediately after a presentation of sea-level rise projections of 7.5 feet above present levels by 2150. Alternatives such as nature-based responses as less well understood, though as discussed above some are already being used, and people in the RMI have a very long history of modifying their environments (Jarillo and Barnett 2022, Spennemann 2006).

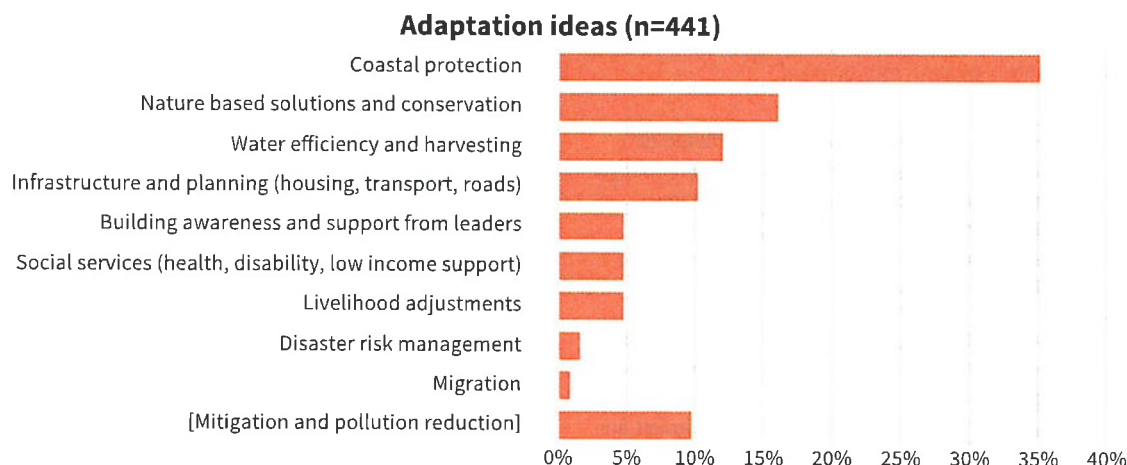


Figure 9: Ideas about adaptation, as reported in the Day in the Life survey.

Many people are nevertheless thoughtful about the benefits and costs of seawalls. Some participants in the focus groups in Majuro were concerned about the lack of maintenance of seawalls in the future, and how that might result in further damage to houses and infrastructure. Respondents in Ebeye noted that the seawall was incomplete and did not prevent flooding from the lagoon. Other participants expressed worry that seawalls are directing wave energy to areas with no protection, causing beaches not to be replenished with sand, and increasing erosion in some areas. In Wotho hard engineering solutions such as seawalls were seen as a last resort option for coastal protection.

Consistent with people's trepidation about seawalls, there were a range of other ideas about how to adapt to coastal change. Many people (and more women than men) suggested nature-based solutions such as coastal reforestation to attenuate waves and wind and slow down erosion (see [Figure 10](#)). Others suggested coral conservation and farming, and marine protected areas. Changes in housing design so that houses were elevated above flood levels were also suggested.

Focus group participants pointed to improving infrastructure to maintain and improve water security. A layered set of responses is suggested. First, reverse osmosis units are effective and people would like more of them, either for the community or small units for households. Participants asked for support in the maintenance of reverse osmosis units, suggesting the need for stockpiles of spare parts and people on each atoll or island trained in maintenance and repair. Second, people suggested better rainwater catchments

(improving roofs and gutters) supplying water tanks so that households can increase their water storage capacity, which can serve as a backup if reverse osmosis units fail. It was suggested this go hand in hand with house retrofitting (or new housing designs), so that homes can better withstand the effects of storms and inundation, including elevating houses and water tanks so they are not damaged during high tides. People were not enthusiastic about concrete communal water catchments as they need frequent cleaning.

As shown in [Figure 10](#), there were a range of ideas about improving public infrastructure as a means to adapt and these ideas were mostly provided by women. Many of these ideas relate to improving transport infrastructure. In Kwajalein and Majuro people suggested improving the design of roads so that they drain better, and better systems for their maintenance. They also suggested a public transport system, particularly so children, the elderly and people with disabilities have better mobility during floods. People with disabilities requested more wheelchairs, walkers and supplies as well as more ramps and sliding doors to improve their ability access services.

Improving transport services within atolls in the form of more boats and canoes was seen as important for improving access to sources of water and food. Likewise increasing shipping and air services between Majuro and Kwajalein, and between these urban centres and outer islands, was seen as necessary to improve the supply of local foods to urban centres, and to increase economic activity and diversify livelihoods in rural islands

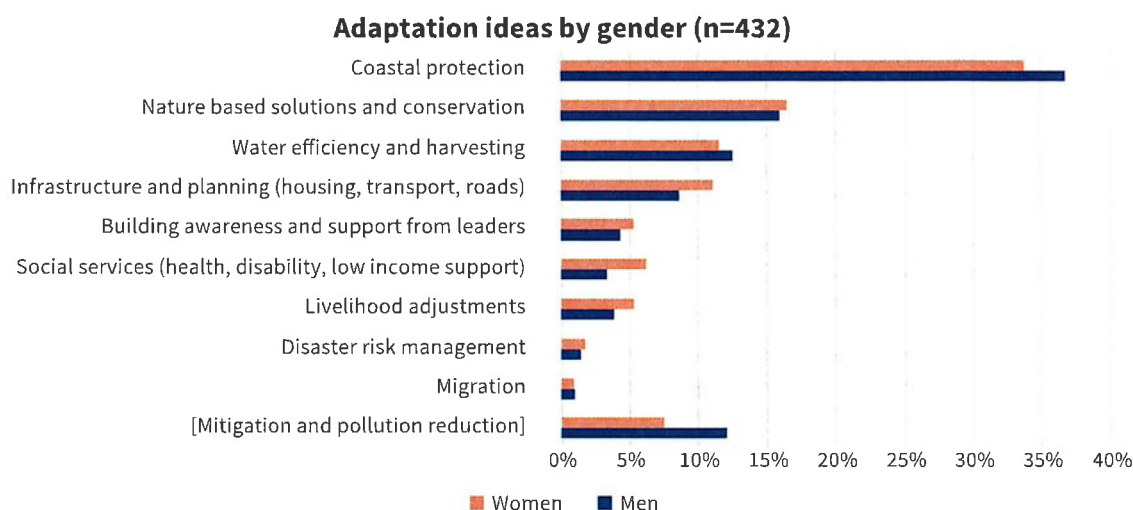


Figure 10: Ideas about adaptation by gender, as reported in the Day in the Life survey

In several islands improving power supply through increased solar systems was suggested. Better sanitation services, and waste management, were suggested by people in Kwajalein and Majuro.

Participants (again mostly women as per [Figure 10](#)) suggested many ideas to improve food security and livelihoods. Key among these was improving transport within and between atolls, as discussed above. Other ideas included planting drought resilient crops, greater use of composting, small-scale irrigation systems, more equipment and materials for gardening, and improving food preservation. New gardens were suggested by some communities, as well as new technologies such as the solar powered aeroponic towers installed in Mejjatto. In some islands agroforestry management to sustain yields from breadfruit and other fruit trees was suggested. A few communities expressed an interest in aquaculture to increase food supply and for export. In all communities there was an expressed need for training in all of these practices as well as supplies of materials, tools and seeds. Some people suggested price controls on food and fuel, increasing the minimum wage, and reducing local taxes

Reflecting their primary responsibility for social reproduction and care, women made many suggestions about ways to improve social services to reduce vulnerability. Key among these was requests to improve access to nurses and doctors and medicines, which was mentioned in almost all rural communities and some urban ones. Linked to observations of increasing distress due to climate change was mention of the need to improve mental health services, because “currently there is no outlet for people when they feel depressed or anxious.” Women also requested more action on domestic abuse, including legal protections, outreach and education, and safe houses. Finally, there were many

mentions of the need to improve education services, including improving school facilities (including water taps and sanitation systems), and improving access to schooling in some areas where demand was greater than supply. Training and education on climate change was also suggested, particularly on adaptation responses:

“The government should do more public outreaches like what this team is doing. People need to be more aware on this matter because I know there are people who knows what climate change is but does not know what the long-term effects are.”

Participants suggested ideas to improve disaster management, and this mostly took the form of improving or developing evacuation shelters. Women suggested that these be stocked with food, water, sanitary products and flashlights, and with multiple rooms that could also serve as women’s centres and safe houses. Other suggestions included better warning systems, developing and communicating evacuation plans, and improving stockpiles of emergency supplies. A disaster response fund to help households recover from storm and flood damage was suggested, as was a flood insurance scheme for businesses.

A striking finding is that although almost all respondents were told there could be 7.5 feet of sea-level rise by 2150, less than 1% suggested migration as an adaptation (see [Figure 9](#)). This was not simply a rejection of the idea of migration to another country, but equally rejection of the idea of migrating to another atoll. People unambiguously stated that they wanted to continue living in their own lands, and this is consistent with their values (see section 4). Across all methods, many participants explicitly stated

their intention to stay there for the rest of their life, saying:

“Home is right here, and yes, I plan to live and serve here for the rest of my life”

“We want to stay in these communities, we want our lives to be secured and try to be resilient towards climate change”

“If we were to move, there would be more difficulties in my opinion since one would not own land and live freely”

“Our home is very valuable to us. I have been here since I was born. So I would be very sad and heartbroken to see this island I call home gone. I would try everything and avoid what it is necessary to keep it from sea level rise or other climate change when it occurs”

“I choose to stay even if it means swimming in my own home”.

There are very few exceptions to this finding, although a small number of participants stated that they would consider migrating ‘as a last resort’, or were already considering migrating for reasons of employment, education and health opportunities.

Youth in Wothe expressed strong determination to remain and to protect and conserve their culture and wrote a song about this. They also conveyed an understanding that adaptation can proceed in steps, along a pathway, saying that it should begin by addressing short-term issues and then building on those to develop more significant responses.

8.4. Conclusions

People in the RMI are not passive victims of climate change. They are responding the best ways they can, but these responses are constrained by poverty and a lack of access to services. They seek to adapt and remain in the islands they call home, and consistently and overwhelmingly reject the idea of migration away from their home islands as an adaptation. Marshallese people are thoughtful about what forms adaptation might take, and relative to people in most other countries are thought and practice-leaders in climate change adaptation, probably because the issue is so salient and valent to them. The Government of the RMI and the international community have a huge opportunity, and responsibility, to work together to bolster local actions and implement many of the ideas suggested in this section: such actions would be well-received and if implemented with care likely highly effective in reducing vulnerability. Indeed, doing so may well establish the RMI as a world leader in adaptation, demonstrating to other small island and developing countries how to enable best practice adaptation.

9. Implications for adaptation

This section builds on the analysis of what Marshallese people value, observe, think, feel and are doing about climate change to outline potential further actions to advance adaptation. The suggestions proposed in this section are not in any sense decisions made by Marshallese people, they are simply options that might be considered as adaptation options. It is for Marshallese people to choose, and prioritise, among these and all other options, which could be done through a second round of consultations to inform communities of all possible and feasible adaptation responses, to help them choose among options, and to structure these into adaptation pathways.

It is important to recognise that the suggestions offered here are based on information of various quality and coverage of the populations of the fifteen atolls and islands consulted for this report. The authors have more confidence in the relevance of the suggestions as they relate to the thirteen rural communities engaged in the consultation process. The selection of these communities was based on criteria that suggests the situation would be similar in other rural atolls and islands. Nevertheless, consultations with communities in the nine further inhabited atolls is necessary. The sample for Kwajalein and Majuro is relatively much smaller

relative to their total populations, so further consultation with more people in both urban atolls is advised.

The suggestions we propose in this section are guided by the ideas people offered about adaptation, all of which are consistent with their stated values. We outline possible actions that respond to local needs, extend already existing responses, are consistent with ideas proposed by communities, and have co-benefits for sustainable development and so are 'no-regrets' actions (that is, actions that would be good to implement even if climate change were not a concern).

Table 3 provides a list of 44 adaptation actions that can begin immediately, and the atolls and islands where these most relate. The locations listed in **Table 3** demonstrate where the information came from and are justified in the individual summaries from these communities that are supplementary to this report. It is likely that other atolls and islands would also benefit from these adaptation activities. The actions in **Table 3** are not ranked by any criteria. Detail about the adaptation actions for specific communities can be found in the appendices. The justification for these actions can be found in sections 5 – 8.

Sector	Adaptation activity	Locations
Livelihoods	Price controls and/or subsidies on food and fuel	All rural islands
Agriculture, forestry and fisheries	Tree planting initiatives to help improve coastal protection, food security, handicrafts, and to reduce heat stress	Most atolls and islands (including Ailinglaplap, Ailuk, Arno, Ebon, Enewetak, Kwajalein, Majuro, Mejjatto, Wotho and Wotje)
	Community gardens, drought tolerant plant varieties, seed banks, composting, small-scale irrigation and aeroponic towers	Most atolls and islands (including Ailinglaplap, Ailuk, Arno, Enewetak, Likiep, Majuro, Mejjatto, Ujae, Utrik, Wotho and Wotje)
	Training, tools and supplies for all new methods for growing crops	Most atolls and islands (including Ailinglaplap, Ailuk, Arno, Ebon, Enewetak, Jaluit, Kwajalein, Likiep, Mejjatto, Wotho and Wotje)
	Site assessments to develop aquaculture in the lagoon to harvest species for local consumption and/or sale	Ailinglaplap, Jaluit and Wotho
	Establish a fish market in Ebeye and a supply chain for fish caught in the Kabin Meto islands	Kwajalein, Lae, Ujae and Wotho
	Creation of a marine protected area	Wotho

Sector	Adaptation activity	Locations
Water security	Increase the number and capacity of household and community rainwater tanks, including fixing roofs and gutters where needed	Most atolls and islands (including Ailinglaplap, Ailuk, Arno, Enewetak, Kwajalein, Majuro, Wotho and Wotje)
	Maintenance plans for reverse osmosis units, including supplies of spare parts, and training on operations and maintenance. Increase the number of RO units to complement rainwater collection where necessary	Most atolls and islands (including Ailinglaplap, Ailuk, Arno, Enewetak, Kwajalein, Likiep, Majuro, Mejjatto, Ujae, Utrik, and Wotje)
	Improve access to groundwater through pumps, water quality testing kits, and water purification systems	Enewetak and Mejjatto
	Elevate water tanks to avoid damage caused by king tides and other inundation episodes	Jaluit and Majuro
	Independent monitoring of radiation levels in fresh water and marine species throughout the atoll	Enewetak and Utrik
Health	Upgrade health clinics	All atolls and islands
	Increase support for health services, including regular access to qualified doctors, female health attendants, and improved access to medicines and other medical supplies	All rural atolls and islands
	A maternity ward	Ailuk
Infrastructure	Building codes to ensure homes are safe in case of typhoons and storms	All atolls and islands
	Pilot new housing systems that are demountable, elevated, cooler, and able to withstand strong winds	All atolls and islands
	Build community facilities that can serve as women's centres and safe houses, shelters in times of disasters, and cool refuges for people experiencing heat stress	Most atolls and islands (including Ailinglaplap, Ailuk, Enewetak, Kwajalein, Likiep, Majuro, Mejjatto, Wotho and Wotje)
	Road repairs and drainage to increase community access	Ebon, Jaluit, Kwajalein and Majuro
	Improve waste disposal systems and increase composting	Jaluit, Kwajalein, Majuro and Wotho
	House repairs and strengthening of roofs and gutters to support water harvesting and resilience from storms	Kwajalein and Ujae
	Connect homes to sewer and water pipelines	Enewetak and Kwajalein
	A handicraft facility for women	Wotje
Coasts	Site assessments to determine the causes of erosion and appropriate coastal protection approaches	All rural atolls and islands
	Pilot nature-based solutions for coastal protection	Most rural atolls
	Coral reef protection, regeneration and replanting	Ailinglaplap and Likiep
Communications	Provide internet and phone access to all households	All atolls and islands
	Improve access to and training in radio systems and technologies	Arno, Enewetak and Ujae

Sector	Adaptation activity	Locations
Education	Provision of educational materials about climate change, including for use in the elementary school curriculum	All atolls and islands
	Develop online learning for students as backups when schools are closed due to flooding.	All atolls and islands
	Strengthen disaster preparedness through early warning communications, emergency kits and evacuation centres	Kwajalein and Wotho
	Run periodic community awareness programmes and training on basic hygiene to prevent communicable diseases	Majuro
Energy	Solar panels and batteries to households to decrease vulnerability during power outages	Arno, Ebon, Kwajalein, Likiep, Majuro and Mejjatto
Governance	Improve laws, education and policing to prevent domestic violence	All atolls and islands
	Disaster recovery fund to help repair / replace property damaged from floods and typhoons	All atolls and islands
	Funding scheme to support the livelihoods of low-income and disadvantaged groups during and after disasters	All atolls and islands
	Long term (10 year) dialogue on land reforms and land use	All atolls and islands
	Community consultations on observations, impacts, responses and adaptation ideas	Aur, Jabat, Lae, Lib, Maloelap, Mejit, Mili, Namdrik, and Namu; and additional communities in Kwajalein and Majuro
	A second round of consultations to inform communities of all possible and feasible adaptation responses, to help them choose among options, and to structure these into adaptation pathways	All atolls and islands
	Government to subsidize disaster insurance for businesses	Kwajalein and Majuro
Transport	Double the frequency of shipping and air services without increasing the cost	All rural atolls and islands
	Strengthening and extend the Waan Aelōñ in Majel (WAM) Program to build local canoes in all atolls	Ailinglaplap, Ailuk, Arno, Ebon, Wotje and Wotho.
	Improve dock facilities	Ailinglaplap, Arno, Kili and Mejjatto
	Improve on-island transportation for the elderly and for people with disabilities	Ailuk, Kwajalein and Majuro

Table 3: Suggested actions to support adaptation in the Marshall Islands

The actions suggested in [Table 3](#) demonstrate that there is much that can be done to support communities to adapt to climate change. Implemented well, they should all serve to help people in the RMI live dignified flourishing lives in their homelands well into the future.

10. Conclusions

This report presents findings from two linked projects that consulted with communities in the RMI to understand their experiences of climate change. These were conducted to ensure that the RMI National Adaptation Plan responds to the needs and values of the people of the RMI.

The community consultations conducted in the RMI set a new standard for National Adaptation Plans. Multiple methods were used in 123 days of site visits across 15 atolls and islands to consult with 1362 people (3% of the national population). The consultation teams not only informed communities, they also listened.

The consultations clearly showed that people in the RMI strongly aspire to continue living in their homelands, which is sustained by their access to place-based natural resources. These factors are key to their sense of place and security. This strongly underscores the need for adaptation solutions that enable people to remain living in their homelands and communities.

Yet this aspiration is clearly threatened by climate change. People across the RMI are observing changes in their environments, including rising sea-levels, increasing air temperatures, and increasing drought and more erratic rainfall. These observations have been made in every island, and by women, men, and youth.

These environmental changes are having widespread and significant impacts on people's lives. Increasing heat, drought, and sea-level rise are undermining livelihoods, causing food and water insecurity, damaging infrastructure, increasing illness, and diminishing social interactions. There is damage to infrastructure and crops, and there are losses of health, land, and social opportunities. These impacts will amplify as emissions increase, and if there is no adaptation to help avert or minimise them.

People in the RMI are not passive victims of these changes. They are responding the best ways they can, but these responses are constrained by poverty and a lack of access to services. They are thoughtful about what forms adaptation might take to ensure they can remain in the islands they call home. Over 99% of people consulted reject the idea of migration away from their home islands as an adaptation.

The Government of the RMI and the international community have a huge opportunity, and responsibility, to work together to implement policies and programs that support local actions to adapt. Informed by communities across the country, this report suggests 44 actions across multiple sectors to support people to live dignified and flourishing lives in their homelands well into the future. Acting soon, and ambitiously, can both protect the rights and aspirations of Marshallese people, and establish the RMI as a world leader in climate change adaptation.

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