

Climate Change and (Im)mobility: Implications for PICTs at Home

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Introduction

Much of the research and publication of material on the issue of climate and migration focuses on the migration process (particularly on whether climate change could be a migration driver) and the likely destinations and numbers of international climate change migrants. Not so much is written on the prospective domestic consequences for Pacific Island Countries and Territories (PICTs) from which emigrants may depart. This Policy Brief (PB), the fourth of a series on matters related to climate change (im)mobility, addresses these issues. It outlines how emigration has affected PICTs not only in general socio-economic terms but also in terms of exposure and vulnerability to climate change effects and capacity to adapt to them. It will also consider the likely futures of those PICTs with high levels of (forced?) immobility. The PB concludes with a consideration of the key issues identified in this four-part series.

The [third PB](#) (PB 174) focuses on international climate migration in terms of the growing Pasifika diaspora especially in Aotearoa New Zealand, Australia and the United States of

America. It shows that the number of people who identify as being migrants from PICTs or their descendants has grown rapidly in recent times, and, while the label climate migrants cannot be placed on this group, it is possible if not likely that environmental degradation has either directly or indirectly (though negative economic effects) influenced recent international migration from several PICTs. This PB now addresses the implications for the PICTs from a domestic perspective.

The PB does not include a discussion of the concepts of voluntary, involuntary or forced immobility, which is included in the second part of this series ([PB 132](#)). Nevertheless, it is about populations of people who have chosen not to migrate or have found themselves unable to leave their home countries.

Can We Stay or Can We Go?

Figure 1 is an attempt to present a schematic representation of possibilities for those who do or do not migrate from PICTs. While this may apply to all international migrants and non-migrants, it is suggested here as a possible scenario if climate change is already, or does become, a migration driver. It is important to recognise that the various categories are not necessarily exclusive, and people may move from one to another. For example, circular migrants, including people who plan to return after a stint abroad often become permanent migrants over time. People's circumstances may also change, enabling or pressing them to move from one category to another.

At present the Pasifika diaspora represents less than ten per cent of the total population resident in PICTs. This indicates that the great majority of Pacific people are, from the perspective of international migration, immobile. Even at the domestic scale, fewer than a quarter of the total population in PICTs live in urban areas, suggesting a degree of immobility at this level as well (return trips to urban areas notwithstanding). Of course, as shown in [Part III](#) of this series, the percentage of 'immobile' people in specific PICTs, compared to either their international diaspora or urban populations, varies greatly, with some countries having very high levels of mobility while others don't. It is also important to acknowledge that the data is heavily skewed by the large populations in the three westernmost Melanesian countries, namely Papua New Guinea, Fiji, and Solomon Islands.

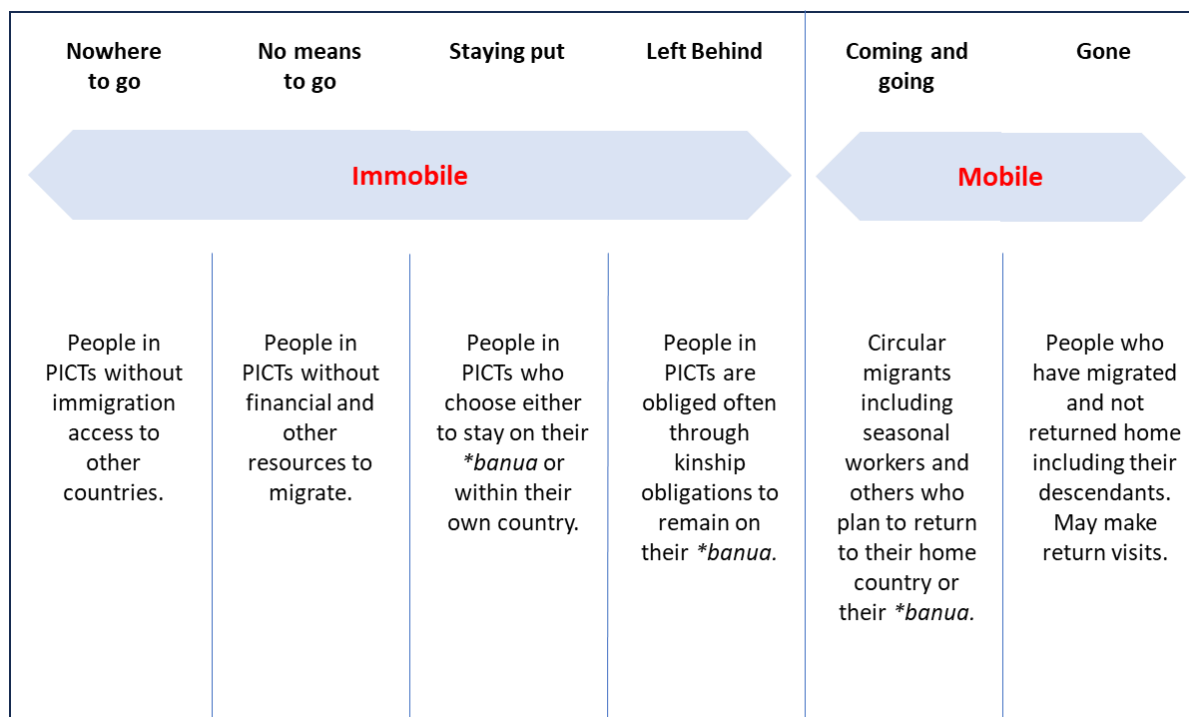


Figure 1. Simplified categorisation of PICT population groups' (im)mobilities in the context of international migration and climate change. Note these categories are not necessarily exclusive and people may move from one category to another.¹ It is important to recognise there are probably significant numbers of people either staying put or left behind who simply have not considered migration.

In Figure 1, four groups of immobile people are identified. The first of these are those with nowhere to go internationally because their country does not have agreements enabling significant numbers of migrants to enter possible destinations. Unlike most PICTs that have existing arrangements with former colonisers—or are still territories—enabling in some cases unlimited migration, the former colonies of the United Kingdom (especially Solomon Islands, Vanuatu (a colonial condominium with France) and Kiribati²) and Papua New Guinea (ex-Australian colony at time of independence) do not have such arrangements. Effectively, people in these countries who would like to migrate are subjected to forced immobility or their mobility options are only within-country. The second group, which may be found in many PICTs, is those who cannot afford the often very high costs of international migration. This includes many people who are excluded from being circular migrants under seasonal work schemes, such as those in Aotearoa New Zealand and Australia, because their communities are not selected to participate, and those who have restricted opportunities to participate because of the many other seasonal workers who are regular returnees. The third group may be referred to as being voluntarily immobile as they choose to stay on their **banua*, even at the risk of perishing if their lands could no longer support them (Corcoran, 2016; Falefou, 2017; Farbotko and McMichael, 2019). It may be asserted that because of

¹ The proto-Polynesian term, **banua* is used here to avoid focussing on one particular usage such as *vanua*, *fenua* or *fonua* (Chave-Dartoen, 2014; Suliman et al., 2019). For fuller discussion see [Part III](#) in this PB series.

² Fiji and Tuvalu were also UK colonies but significant numbers of their citizens have found pathways to other destinations such as Aotearoa New Zealand and Australia.

their intimate inclusion as part of the **banua*, they feel they have little choice but to stay put. The fourth group among the immobile are those who are required to stay behind when fellow kin members migrate. As Lilomaiava-Doktor (2009a) indicates, decisions on who migrates are often made at the level of the kinship group. If one is not selected to migrate, they are then required to stay. It is also important that land is not left unoccupied as this would leave the critical **banua*-community bond fractured. As noted above, these four groups represent the overwhelming majority of people living in PICTs (estimated 12.3 million in 2020 (SPC, 2020)).

While not the object of this report, the mobile populations are in two groups. First, there are those whose migration is intended to be temporary. Early literature suggested that most Pacific migration, be it within country or beyond, was of this variety. However, with the persistently growing urban populations in many PICTs and the increasing diaspora populations—with many second- and third-generation descendants (and beyond)—, it is becoming clear that much migration is permanent and where people return home it is often for relatively short periods. Accordingly, then, there is considerable movement from the circular migration group into the permanent migrant category. The one group where return is thus far required is that including seasonal labourers from PICTs to Australia and Aotearoa New Zealand.

It is important to recognise that this is a representation of material elements of migration based on colonially imposed boundaries and not taking into account traditional concepts of place such as the *vā*, a relational notion of space in which all members of a community, such as a kinship group, belong in one 'space' irrespective of their location (Lilomaiava-Doktor, 2009a, b; see also [PB 132](#)).

Meanwhile ... Back in the Islands. The Demographics of Populations in Oceania

This section turns to the issues facing those who remain on their **banua* or stay within their country but migrate locally, usually to urban areas. An important question is posed, but not adequately answered: are those who remain better equipped to face climate change because of the emigration of their kin (in line with theories of migration as adaptation) and the establishment of growing diaspora born overseas, or are they disadvantaged? As noted, the implications of international migration for PICTs are varied in terms of their colonial histories and postcolonial connections and the resulting opportunities or otherwise for emigration. The implications also vary depending on the population size of each of the PICTs. Some of the countries with the largest diasporas relative to their domestic population are unlikely to have large future numbers of migrants as their populations are already very small.

The contemporary populations of the PICTs

While fully acknowledging the belittling nature of the small island discourse identified by Hau'ofa (1993) and the transnational nature of Pacific Islands populations/societies (e.g., Lilomaiava-Doktor, 2009a, b; Macpherson and Macpherson, 2009), the effects of outmigration do appear to be potentially more salient for smaller sized states. Table 1

shows the 21 PICTs that make up the region. Except for Papua New Guinea, which accounts for almost three-quarters of the regional population and is virtually ten times the size of the next biggest, Fiji, all PICTs have populations lower than one million people. Indeed, just over half have populations lower than 100,000 and seven boast resident populations of fewer than 20,000. The different shades on the table indicate the different groups according to their population size.

Table 1. Pacific Countries and Territories Ranked by population size (2020 est.)

Country	Population 2020 (est.)
Tokelau	1500
Niue	1600
Tuvalu	10600
Wallis and Futuna	11400
Nauru	11700
Cook Islands	15300
Palau	17900
Marshall Islands	54600
N. Mariana Is.	56600
American Samoa	56800
Tonga	99800
FSM	105500
Kiribati	118700
Guam	176700
Samoa	198700
New Caledonia	273000
French Polynesia	278900
Vanuatu	294700
Solomon Islands	712100
Fiji	895000
PNG	8935000

Source: Data from Secretariat of the Pacific Community (SPC) (2020)

It does appear from examination of the demographic data for PICTs that the smallest populations are also those which have experienced the heaviest rates of outmigration³. This may be attributed to their colonial and post-colonial links to metropolitan countries. On the other hand, the larger nations (Fiji excluded), as noted above, have very limited emigration because of border restrictions in their former colonisers.

One possible approach is to examine the effects of emigration on the age structures of the PICTs which by and large have high dependency ratios. This refers to the percentage of the

³ Of course, outmigration has contributed to the low populations of these islands but most had relatively small populations to start with.

population supported by those of 'working age', usually depicted as people between 15 and 64. As Table 2 indicates, 62 per cent of the PICTS have age dependency ratios which would place them in the highest quarter of countries globally.⁴ For comparison the three main destination countries (Aotearoa New Zealand, Australia and the United States) have dependency ratios around 53 per cent. Often the dependency ratio is used to indicate the burden of very young and old members of the population on the 'economically active'. In addition, post-disaster rehabilitation is more effective if there is an active population to do the work (clearing debris, rebuilding, replanting, etc.), and if disaster losses increase as a result of climate change this may be an important factor. Emigration from this perspective may be seen as causing pressures on those who remain, given that those who emigrate are mostly from the 'economically active' segment of the population, although the extent to which remittances reduce this 'burden' is not clear. It may also be noted that children and older people in many PICTs are economically active to some degree and contribute to family subsistence needs.

Table 2. Dependency ratios of PICTS (2020)

Country	Dependency Ratio
Niue	89
Samoa	89
Solomon Islands	82
Tonga	80
Vanuatu	79
RMI	78
Tuvalu	76
American Samoa	75
Nauru	73
Tokelau	72
Wallis and Futuna	72
Cook Islands	71
Kiribati	70
Papua New Guinea	69
Guam	68
FSM	67
Fijian	64
New Caledonian	60
Northern Marianas	56
French Polynesia	55
Palau	54

Source: Data from Secretariat of the Pacific Community (SPC) (2020)

⁴ Based on World Bank data: <https://databank.worldbank.org/source/gender-statistics/Series/SP.POP.DPND#>.

The table does suggest that some of the smallest PICTs, and those with high emigration, have the highest dependency ratios, but there are exceptions. For example, Solomon Islands and Vanuatu are high on the list but they have relatively large populations and low emigration rates. On the other hand, they have some of the highest fertility rates in the region. While they have very small proportions of elderly people, the youth components of their populations are very large. A major challenge facing these countries will be finding employment for the growing 'youth bulge' (Bedford, 2008). If climate change were to reduce economic opportunities, pressures for emigration may increase significantly.

Table 3. Annual Population Growth Rates

Country	Annual Average Increase (%)
Niue	-1.2
Wallis and Futuna	-0.5
Tonga	-0.3
Marshall Islands	-0.1
Tokelau	0
Palau	0.2
New Caledonia	0.3
Federated States of Micronesia	0.3
American Samoa	0.3
Fiji	0.4
Northern Mariana Islands	0.4
Cook Islands	0.4
French Polynesia	0.4
Samoa	0.6
Tuvalu	0.8
Guam	0.9
Nauru	1.6
Kiribati	1.7
Papua New Guinea	2.1
Solomon Islands	2.2
Vanuatu	2.2

Source: Data from Secretariat of the Pacific Community (SPC) (2020)

Another indicator of population dynamics is population growth, which is a function of natural increase rates and migration. Generally, most PICTs have low annual average increase rates, with 62 per cent of PICTs having growth rates of 0.4 per cent per annum and lower (see Table 3) compared with 36 per cent of all countries in the world.⁵ Of these, four

⁵ Based on World bank data: https://data.worldbank.org/indicator/SP.POP.GROW?most_recent_value_desc=false

have negative average growth, namely Niue, Wallis and Futuna, Tonga and the Marshall Islands. Tokelau sits on zero. Only five PICTs have rates exceeding 1.0 percent and three over 2.0 per cent: these are the large Melanesian countries with no emigration access. It is clear from the table that the lowest annual growth rates are of PICTs with high rates of out migration. An important issue is whether climate change forced or induced migration from these countries would result in populations becoming too small to be sustainable.

Recent census results suggest further declines in the populations of some PICTs. In the 2020 United States census, American Samoa recorded a population of 49,710 people compared with 55,519 in 2010. This was an intercensal decline of 10.5 per cent.⁶ The Republic of the Marshall Islands (RMI) recorded a similar decline in its most recent census (see [Part III](#) in this series).

Net migration rates also provide an insight into the population dynamics of PICTs. With the exception of only Vanuatu which sits at zero, all the PICTs have negative net migration rates. As Figure 2 shows, those PICTs with access to Pacific rim countries have the largest shortfall between those who leave and those who enter. Meanwhile, unsurprisingly, the countries with very restricted access have very low rates of outmigration. Interestingly, some countries with relatively free migration access such as Cook Islands and Palau have low net migration rates. Their populations are very small, and it is possible that the potential for further migration has been reduced.

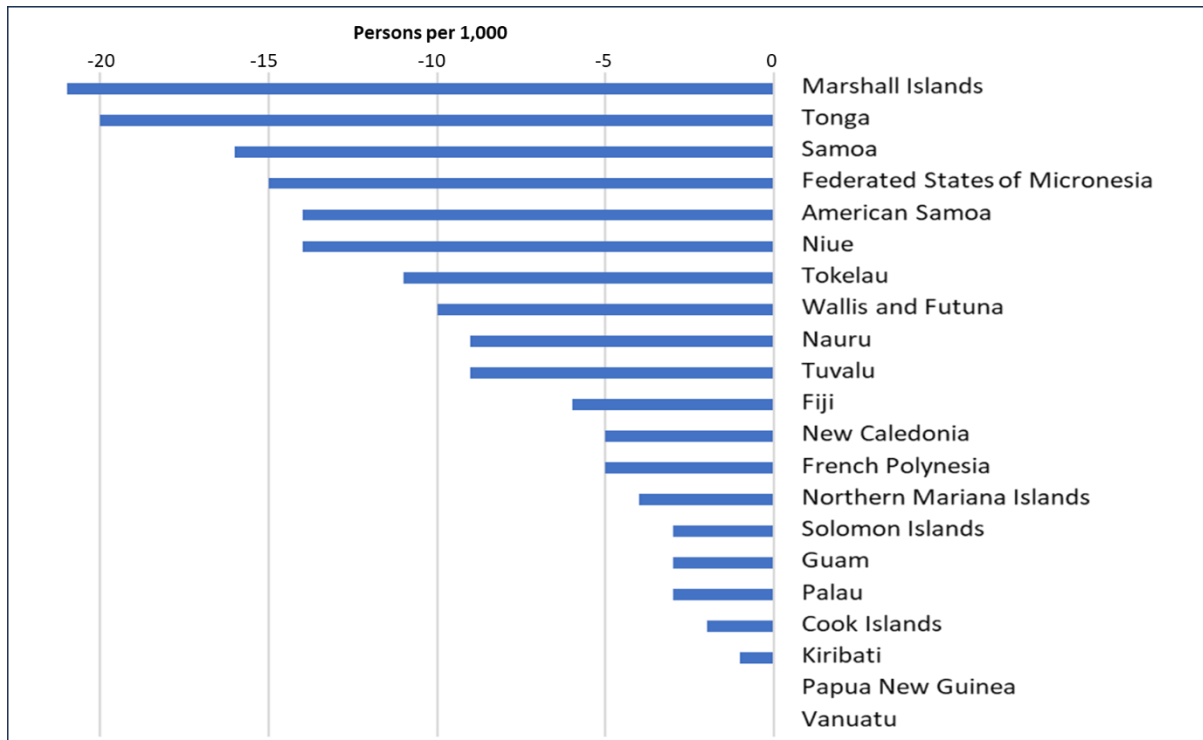


Figure 2. Net migration rates for PICTs (Source of data, SPC 2020)

⁶ <https://www2.census.gov/programs-surveys/decennial/2020/data/island-areas/american-samoa/population-and-housing-unit-counts/american-samoa-phc-table01.pdf>

From this analysis it is perhaps possible to divide the PICTs into three groups. Two are quite distinct – those with either very large or very small diasporas. These are the immobile and the mobile countries respectively. In between lies a third group of countries which are not so easily classified, some with access and others without, some with relatively large diasporas and others without. These are illustrated in Table 4. The implications of climate change and mobility in these three groups are significantly different. Those in the first group are largely characterised by small domestic populations, large diasporas and—with only a few exceptions—heavy reliance on aid and remittances. Because they already have small populations, they are unlikely to be sources of large numbers of so-called climate migrants. Those in the in-between group are less easy to describe given their range of characteristics. Some, however, may potentially be sources of significant numbers of migrants. The final group is those countries with large, mostly rapidly growing, populations but limited opportunities for migration. It is possible that environmental degradation in these countries may bring about increasingly urgent calls for emigration access. However, it should be noted that other pressures for migration also exist – the four countries in this group also have the lowest GDP per capita in the region.⁷

Table 4. Categories of PICTs based on migration characteristics.

High levels of migration Large diaspora Guaranteed emigration Access	Tokelau Niue FSM Cook Islands	Wallis and Futuna American Samoa RMI	Mostly small populations Facing significant degradation Adaptation difficulties Dependency Remittances Development assistance Compensation (L&D) Not likely sources of large number of climate related migrants
Range of levels of migration Range of diaspora sizes Range of emigration access possibilities	Tonga Samoa Nauru Tuvalu Fiji New Caledonia CNMI	French Polynesia CNMI Guam Palau	Range of population sizes Facing significant degradation Adaptation difficulties Dependency Remittances Development assistance Compensation (L&D) Some possibly sources of large number of climate related migrants
Low levels of migration Small diaspora Limited to no emigration access	Papua New Guinea Solomon Islands Vanuatu Kiribati		Mostly large populations Rapidly growing populations Facing significant degradation Increasing population pressure on resources Dependency Development assistance Compensation (L&D) Possibly future sources of large number of climate related migrants

⁷ Secretariat of the Pacific Community (n.d.) Gross Domestic Product for Pacific Island Countries and Territories

[https://stats.pacificdata.org/vis?lc=en&df\[ds\]=SPC2&df\[jd\]=DF_NATIONAL_ACCOUNTS&df\[ag\]=SPC&df\[vs\]=1.0&dq=...GDPCPC.&pd=2012%2C&ly\[rw\]=GEO_PICT&ly\[cl\]=TIME_PERIOD&to\[TIME_PERIOD\]=false](https://stats.pacificdata.org/vis?lc=en&df[ds]=SPC2&df[jd]=DF_NATIONAL_ACCOUNTS&df[ag]=SPC&df[vs]=1.0&dq=...GDPCPC.&pd=2012%2C&ly[rw]=GEO_PICT&ly[cl]=TIME_PERIOD&to[TIME_PERIOD]=false)
accessed 2 Oct, 2023

Emigration and remittances

A key component of the migration as adaptation concept is that loss and damage in the home islands, and costs of adaptation, could be offset by remittances from climate induced migrants. The economies of countries in the Pacific region are more dependent on remittances than in any other part of the world (Bedford and Hugo, 2012). The various writings on transnationalism in Oceania and the role of the *vā* in connecting migrants and their home-based kin, point to the role that remittances play in supporting the home-based populations. Indeed, remittances are two-way exchanges as traditional goods (including foods) often flow back to the diaspora (Campbell, 2020). The role of remittances is encapsulated in the famous MiRAB economy model developed by Bertram and Watters (1985). The term stands for economies reliant on **M**igration, **R**emittances, **A**id and **B**ureaucracy (government jobs funded by foreign aid). Early responses were that MiRAB economies fostered dependency among many of the small PICTs. However, remittances have come to be considered an important element contributing to development. Moreover, remittances are being increasingly portrayed as key elements of post-disaster response in many PICTs (Connell and Brown, 2005; Le De et al., 2013, 2014, 2015). With increasing rates of migration away from the PICTs to the rim countries, an important issue will be whether remittances will continue to play a role. To date, remittances are critical elements of the economies of many PICTs and of the economic, social and cultural lives of their people.

Opponents of the MiRAB model find it too focussed on economic exchange and insufficiently takes into account social and cultural considerations, such as funds from remittances being used for special events, such as weddings and funerals, and to build community structures such as churches. Whatever their purpose and application, remittances play a critical role in those communities with large diaspora. While there is considerable speculation that the quantum of remittances may fall through time, in a process of remittance decay, the evidence of such a trend in the Pacific region is contradictory (Bedford and Hugo, 2012; Connell and Brown, 2005). Of interest are those growing numbers of Pasifika who are several generations removed from their 'homelands': will they have the same levels of commitment as recent migrants? How strong will be their sense of inclusion or obligation to the *vā*? In addition, many Pasifika people are struggling economically in the three rim countries with low incomes, high accommodation costs and in some cases other social (health, education) costs. With recurrent economic downturns, the capacity of diaspora members to remit funds to kin is placed under pressure, and for many, debt results. At times of significant need (e.g., disasters and special occasions) in the homeland, some diaspora members may go into debt to meet their obligations (Le De et al., 2016).

While many writers have observed that remittance fatigue has not occurred, Macpherson and Macpherson (2009) suggest that while the transnational *aiga*⁸ remains strong, there are growing numbers of New Zealand-born Samoans whose links to home are becoming weaker over time. Increasingly difficult economic times and growing obligations to members of the *aiga* living in Aotearoa New Zealand may, in time, lead to a reduction in flows from diaspora back to the home village. There is also evidence to suggest that

⁸ *Aiga* refers to extended family or kinship group.

remittances tend not to benefit people in the home country who are poor, whose households have been unable to support migration of their members. Le De et al. (2016) found that, in Samoa after the 2012 cyclone Evan, these households were more vulnerable to disaster. It is likely that such households would also find it difficult to adapt to climate change.

The role that remittances may play in funding adaptation to climate change is not well understood yet. It may be happening already in the form of contributions to seawalls and other projects, and supplementing subsistence (Barnett et al., 2013; Betzold, 2015; Kagan, 2016; Monnereau, and Abraham, 2013). If this were to occur it would be a significant change: from the remittances contributing to home community development (Lilomaiva-Doktor, 2009a, b) and contributing to aiga advancement, to remittances being diverted to adaptation (simply surviving or stagnating. The concept of migration and remittances as adaptation may sound beneficial on the surface, but its outcomes are that the kinship groups, be they at home or elsewhere in their transnational community, who are negatively impacted by climate change, must pay for the costs that are incurred rather than the polluters that caused the problems.

It is important to also acknowledge the role of internal remittances from urban areas to rural home villages (e.g., Petrou and Connell, 2017). While most research focuses on international flows of remittances, with increasing urbanisation in the context of climate change, it is possible that such urban-rural flows may increase. On the other hand, projections of hardship among the populations of the growing informal urban sector may see such remittances being restricted and possibly urban migrants increasingly dependent on remittances (especially food) from home, rural environmental degradation notwithstanding. Petrou and Connell (2017) illustrate the importance of translocal communities in Vanuatu; they are likely to be equally important in other countries (especially in Melanesia) with restricted emigration access.

Case study: Niue

As the various tables and graphs indicate, one of the PICTs most affected by migration is Niue which is in free association with Aotearoa New Zealand; Niue's people carry New Zealand passports and are thus free to travel back and forward between these two countries as they wish. As the data tends to show, however, return migration is limited. Figure 3 shows the population of Niue growing until the 1960s, when an airport was established, peaking at 5194 in 1966. The provision of free access to New Zealand was approved in the 1970s and population decrease was steady between then and the present. The population is projected to become steady at around 1,500 through to mid-century.

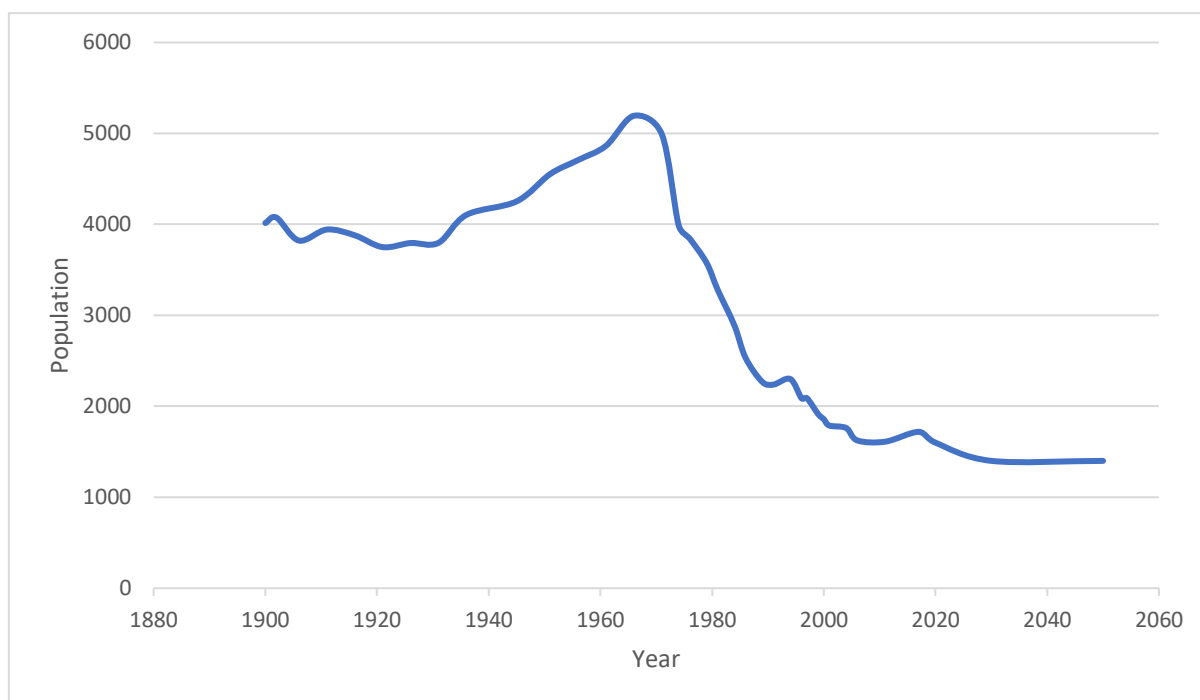


Figure 3. Population of Niue from 1900 to 2050.

Sources: Statistics Niue (<https://niuestatistics.nu/category/population/>); SPC (2020) (estimates for 2020, 2030 and 2050)

As suggested above, the number of Pasifika people born in Aotearoa New Zealand is outstripping those migrants born in the Pacific. This is especially so for Niueans as shown in Figure 4. In the 2018 census, slightly more than 25,000 Niueans reported being born in Aotearoa compared with only 5,109 born on Niue itself. Even this latter number is more than three times the population of the island. If the number of Niueans in Australia is added to their diaspora, then the diaspora is 23 times the size of the island's resident population.

Figure 4 also shows the increase in the New Zealand-born population of Niueans with the number of Pacific-born (presumably overwhelmingly, Niue-born) slowly declining. Further, if we look at these data in terms of age, the Niue-born population is aging compared with that born in Aotearoa. Of the Aotearoa born population, 82.5 per cent were under the age of 30. In comparison, the overseas-born (i.e., Niue) population in Aotearoa had a population in which 80.4 per cent were 30 and older.

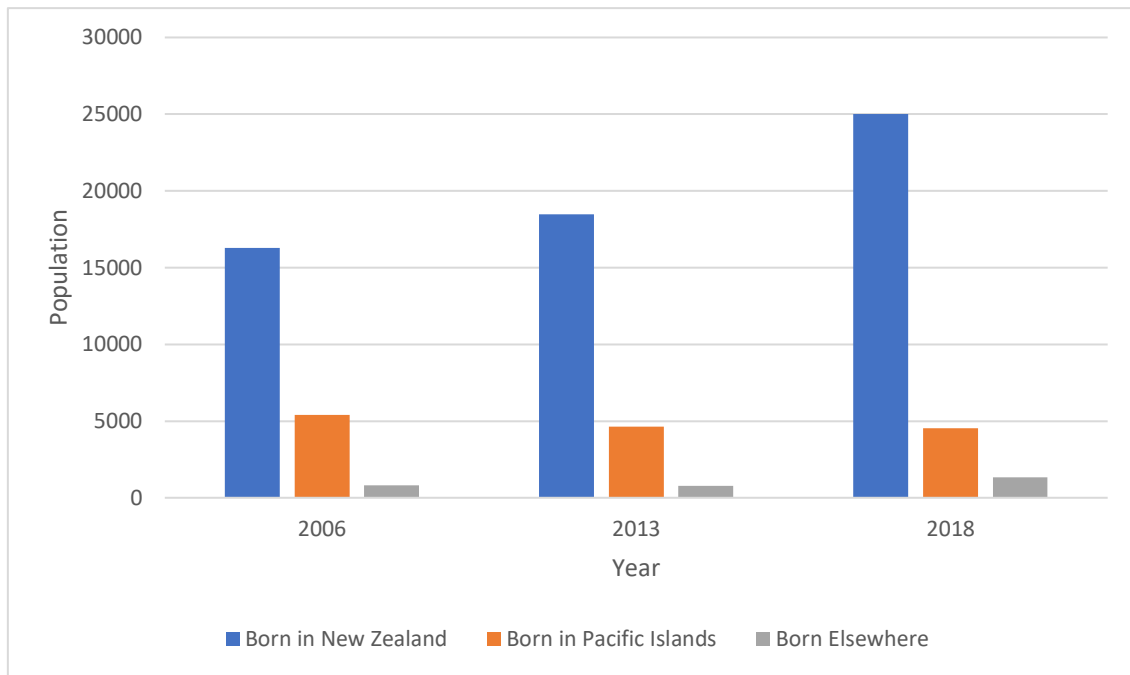


Figure 4. The Niuean population in Aotearoa by place of birth.

Source of data [Statistic New Zealand 2018-census-ethnic-group-summaries-xlsx-updated-14-8-20 \(2\).zip](#)

One may assume that with such a large diaspora the resident population of Niue would be supported by large flows of remittances. However, because the population is so small, aid and—relatively recently (but pre-Covid)—tourism have been the mainstays of the economy (Watson and Nel, 2020). In addition, when populations become very low, the role of aid becomes more significant on a per capita basis, while not being overly large in absolute terms. Together with Tokelau, Niue receives by far the largest ODA per capita among all the PICTs (Dornan and Pryke, 2017). Public service employment, based on aid from New Zealand, enables the population to enjoy relatively high standards of living without dependence on remittances.

Together with Niueans, Cook Island Māori and Tokelauans have the greatest proportion of their New Zealand population born in Aotearoa. It might be speculated that, at a certain threshold, outmigration may slow down as the number of potential migrants drops and the home population requires a certain number to remain functional. Nevertheless, Niue, while being a raised atoll, is exposed to many of the effects of climate change including mean and extreme temperature increases, increasing tropical cyclone intensity, changes in mean annual coral bleaching and sea level rise (Government of Niue, 2016) which could conceivably drive further outmigration. Conversely, new sources of financial support for adaptation or even loss and damage might further the role of external financial flows to Niue.

Jon Barnett (2012), based on work in Niue, observes that loss of a large portion of an already small population may have numerous negative effects on the remaining population and effectively render them increasingly vulnerable to climate change. This may indeed be correct, but it could also be claimed that those who have moved (by far the majority of the population) have reduced their exposure.

Climate change, atolls and migration

Briefly described, atolls are roughly circular coral reefs upon which low-lying islands, rarely more than a few metres above sea level, have been formed. The reefs and islands usually surround a lagoon. They have no surface freshwater and depend upon convectional rainfall to replenish a lens of ground water beneath the island surfaces. Given these characteristics, atolls have been represented as highly vulnerable to coastal and climatic processes and are often described as being in the frontline of climate change, canaries in the climate change coalmine, titanic states (Barnett and Campbell, 2010) and the probable source of the first batches of ‘climate refugees.’

Well over half of the world’s atolls are in the Pacific region (Goldberg, 2016). Most of these, however, are not inhabited. There are four states in the world that comprise only atolls (although Kiribati includes two raised atolls), and three of these—Kiribati, Tuvalu and Marshall Islands—are in the Pacific region. To these, the New Zealand territory of Tokelau may be added. There are, in addition, several PICTs with large numbers of atolls including Federated States of Micronesia, Cook Islands and French Polynesia. Several atolls are also found in other PICTs such as Papua New Guinea and Solomon Islands. The Carteret Islands (Tulun) in Papua New Guinea have gained global attention as some members of its population seek resettlement in Bougainville, the nearest large and elevated landmass (Boege and Rakova, 2019; Rakova, 2014).

Initial representations of the effects of sea-level rise on atolls were of islands being inundated and ‘sinking’ beneath the rising waters. In addition to being alarmist (Farbotko, 2010), these assertions were not borne out by studies of atoll geomorphology that raised numerous questions about the physical responses of islands on atolls to changes in sea-level (Kench et al., 2018; McLean and Kench, 2015). They found that many more atoll islands increased in size than those which didn’t over a 40-year period in which Pacific sea-levels had risen twice as rapidly as the global average. The simplistic tropes were no longer sustainable and for some were replaced by discourses of uninhabitability in efforts to provide a more balanced evaluation of climate effects on atoll islands – reduced or variable fresh-water availability, increased tropical cyclone intensity and events that involved storm surges washing over the land that contributed to island building (e.g., Campbell, 2014; Duvat et al, 2020).

There has been recent debate about atolls and the risks their people face in the context of climate change. The governments of atoll states are extremely worried about the possible effects of climate change, but also strongly resist the notion that forced migration is inevitable. There are different elements to their stance.

First is the concern that forced migration would shatter the relational security that their people have, which is based on an ontology that the people and place are one, mutually constituting each other in both material and non-material ways.

Second, they believe, with good cause, that they should be able to stay in place if the international community of GHG emitters were to take meaningful steps to reduce

emissions and provide adequate funding for appropriate and effective in-situ adaptation measures.

Third, there is a growing belief that projections of looming uninhabitability are the product of knowledge systems that have little understanding of, or are ignorant of, local ontologies (Farbotko and Campbell, 2022). Local understandings of inhabitability of place appear to diverge significantly from those of external agents. This does not, as indicated in earlier general discussions, mean that people are transfixed to place, and permanently immobile. As has been described in this series, mobility over a range of distances was and is common to the Pacific. An important consideration is that mobility is facilitated by the knowledge that people have continued attachment to their **banua*, as part of their *vā*, and that they may return to it at some future time.

Fourth, as mentioned previously, there is a strong indication based on the past several decades that atoll islands are not necessarily liable to erosion and permanent inundation, at least under conditions of quite moderate sea level rise. The findings of the IPCC, AR6, however, that indicate much greater rates of global warming may be expected in the years ahead and that the 'tipping point' of 1.5°C. is perilously close, raise questions as to how useful past and present conditions will be as analogues of climate futures. Uncertainty remains a salient characteristic of PICT environmental change.

Urbanisation in the atoll countries

All of the three independent atoll states also have recent high rates of urbanisation, despite the urban areas having significant problems of high population density and crowding, unemployment, housing, environmental degradation and poverty. This may suggest that the process of urbanisation in the atolls is propelled by push factors from the rural atolls rather than the pull of urban centres (although perceptions of greater opportunities may play a significant role). This is illustrated for Kiribati in Figure 5. With restricted international emigration access, South Tarawa, the capital of Kiribati, has grown rapidly from just 5.3 per cent of the population of what is now Kiribati in the year 1947 to 53 per cent in 2020. In the decade between 2010 and 2020, Tarawa's population grew by 26 percent compared with the national increase of 16 percent. As a result of this growth, Tarawa has a very high crude population density of almost 4,000 people per square km, and faces serious problems associated with water supply, coastal flooding and waste (including sewage disposal). Betio, the most densely populated part of the capital, has a density of more than 10,000 persons per square km (Republic of Kiribati, 2021).

In Tuvalu the numbers are lower, but the capital Funafuti with a population of 6320 in 2017 has 60 per cent of the national population, compared to 51 per cent just five years previously. The outer islands' populations declined by 4.3 per annum over the same period. The population density in Funafuti is 2257 persons per square km (Government of Tuvalu, 2018).

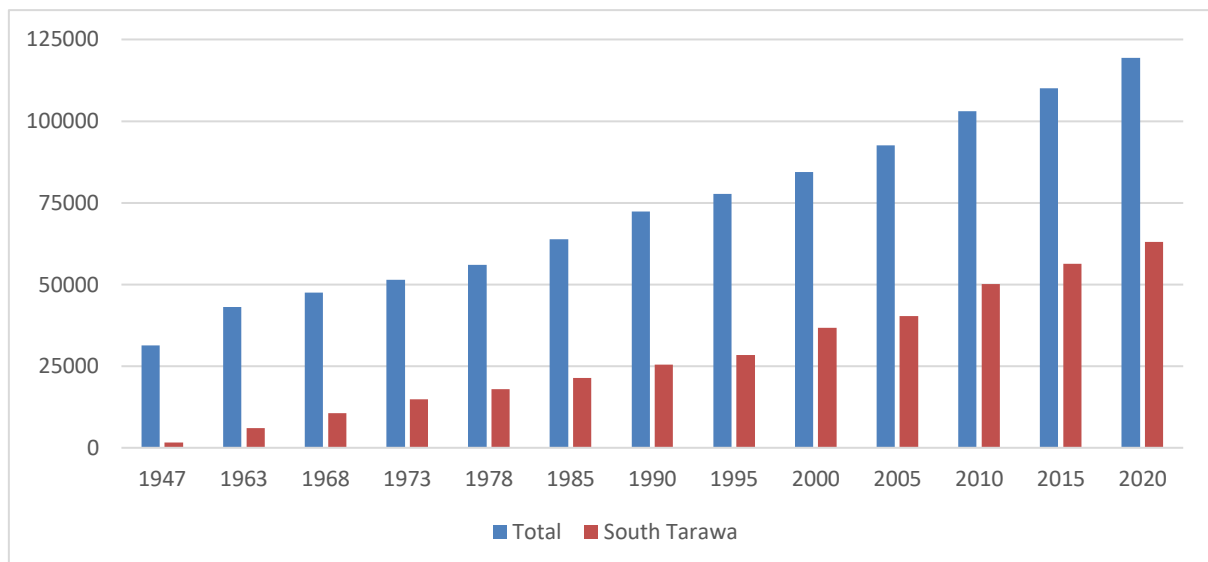


Figure 5. Population of Kiribati and of South Tarawa 1947-2020.

Source of data: Republic of Kiribati, 2021

In RMI, of the 25 atolls with enumerated populations in 1999, only seven had increased their population by the time of the 2011 census, with the two urban atolls, Majuro (the capital) and Kwajalein, showing by far the greatest growth. These two atolls had a combined population of 39,205 in 2011, which was 73.75 per cent of the national population. Moreover, the combined populations of these two atolls had grown from 34,578 in 1999 (an increase of 13.4 per cent). In comparison, the combined populations of all the other atolls had fallen by 14.2 per cent in the same period. Not surprisingly, like both Funafuti (Tuvalu) and South Tarawa (Kiribati), the two urban atolls of RMI have among the densest populations in the Pacific region. Interestingly, with the major national population decline recorded in the last census, the numbers living in the two urban atolls also dropped for the first time, suggesting perhaps that the urban areas were part of a stepwise process of international migration. Whether the surge in migration from RMI is the result of push factors in the islands (perhaps resulting from the effects of climate change) or pull factors in the USA is difficult to determine.

RMI is the one atoll country with unencumbered access to emigration. Despite the major differences in the sizes of their populations, both Tuvalu and Kiribati have the same numbers eligible to Aotearoa New Zealand's Pacific Access Category, under which set numbers of places for migrants are allocated to people from certain PICTs (Kiribati and Tuvalu up to 150 persons, and Fiji and Tonga up to 500 persons yearly). This has enabled Tuvalu to build a relatively significant diaspora in Aotearoa in comparison to its size. Little work has been done to evaluate the reasons for the rapid growth in urbanisation over the past decade or so, but the possibility of social and economic push factors to some extent exacerbated by environmental degradation cannot be discounted. Moreover, if greater immigration access is given by the rim countries to people in Tuvalu and Kiribati, their diasporas may grow relatively quickly.

Urbanisation in PICTs Without Emigration Access

It is hard to understand the challenges of urban life and the fraught relationship between town and village without remembering that once they have moved to town, urbanites have few options for further mobility. (McDougal, 2017, para 5)

As indicated in Figure 2 above, Papua New Guinea, Solomon Islands and Vanuatu have very low net outmigration rates, indeed some of the lowest emigration rates in the world (Curtain et al. 2016, p3, cited in McDougal, 2017, para 5). As we have also seen, Kiribati has similar characteristics. It is not surprising, then, that these countries, have very fast rates of urban growth (see also PB 46 and 49 and Campbell, 2022 for consideration of urbanisation and climate change in greater detail). The three Melanesian countries, while boasting almost half of PICT urban populations, are still largely rural (88 per cent compared with 77 per cent for the region as a whole, Campbell, 2022) suggesting the potential for much more urban growth, especially given that there are virtually no other options for people wishing, or feeling impelled, to leave rural areas. Available land in most urban areas in the region, including these countries, is very limited and large numbers of urban migrants live in informal settlements with limited or no land security. These settlements, often in peri-urban settings, have few services such as electricity, clean water supplies and sanitation. Most urban areas have high rates of unemployment and underemployment with accompanying high levels of poverty. As urban migration increases, the demand for limited space is also growing and the density of informal settlements is growing. Many urban residents find themselves in exposed areas such as unstable slopes and areas liable to river and/or coastal flooding. Increasing tensions over access to safe land and poverty may be potential sources of increased conflict in urban areas (Campbell, 2022). The issue of external migration access will be critical for the sustainable development of urban areas in these countries.

The Implications of Depopulation

Currently the diaspora in the three main rim countries is no more than around 1.25 million (see [Part III](#) of this series, Table 1).⁹ This figure is approximately, at a maximum, around 10 per cent of the total 2020 resident population in the Pacific (12,326,150, SPC, 2020). If we applied the percentage to 2050 SPC population projections, the diaspora might be extrapolated to 1.9 million persons. However, it needs to be recognised that most of the diaspora are not from Papua New Guinea, Solomon Islands and Vanuatu, which account for 83 per cent of the regional population. From this perspective, the contemporary diaspora is perhaps equal to half the population of the remaining countries of Micronesia, Polynesia and Fiji. If we applied this exercise to 2050 projections, the size of the diaspora, assuming similar rates of migration to present ones, would be relatively unchanged, as population growth in most of these countries is projected to be quite low. Most of the growth will be in

⁹ And perhaps significantly smaller, considering these data include people identifying more than one ethnicity, ancestry or race.

those Melanesian countries which contribute, because of limited migration access, very little to the existing diaspora.

There are two possibilities that need to be considered. First, continued growth of the Pasifika diaspora in the three rim countries would come at the cost of population stagnation or decline in the contributing countries. Indeed, the SPC projections indicate seven PICTs will have declining populations between 2020 and 2050, and several others have very low projected increases. This may be seen, however, as a particularly 'scientific' view. As Lilomaiva-Doktor (2009a) points out, the *vā* incorporates both migrants and those who stay at home. Thomsen et al. (2022), also building on Macpherson and Macpherson (2009), who describe Auckland as comprising sub villages of those that the migrants have come from, explain it well:

Although their physical and social distance from the islands' villages has meant that the *pitonu'u* do not always exert great influence over everyday life in the islands, they are nonetheless a testament to how diasporic Moana populations are often part of the same transnational village (Levitt 2001)—that is, embedded in social networks that span multiple communities across national borders. As such, the growing Moana diaspora in New Zealand and elsewhere should not be interpreted as population "loss" for the home islands but rather as population expansion and relocation and as a decidedly cultural act that maintains social and cultural ties across national borders (Macpherson and Macpherson 2009, 82; Lilomaiva-Doktor 2009).

However, if climate change does result in further migration as small populations struggle to remain functional, further population losses may become challenging.

Second, if increased access is granted to the three independent western Melanesian countries, the diaspora may grow significantly. These countries, while large, nevertheless, are also exposed to a range of climate change effects, they all have very significant coastal populations, densely populated river flood plains and deltas, and PNG has a large interior population exposed to relatively frequent droughts. If climate change does induce migration from exposed sites, will the international community expect the three countries to absorb large numbers of internal migrants? All of them already have significant urban crowding issues.

If emigration from Micronesia and Polynesia continues, it is possible that several countries may be placed at considerable disadvantage with small populations, and high dependency ratios. This may result in those countries struggling to maintain sustainable services for the populations that do remain.

Discussion

At the beginning of the [third PB](#) in this series, I reflected on my uncertainty about the likelihood of forced or induced climate change migration. In fact, there is a very broad range of possible (im)mobility outcomes because of climate change and great potential for uncertainty. These are outlined in this section, presented as a series of binary opposites, although each of these considerations exist as a range of possibilities between two extremes.

Climate change does/does not drive migration

I will say little here as this issue is dealt with throughout this series of Policy Briefs. The position taken often reflects the ways in which we see the world, particularly in terms of human-environment interactions. This is illustrated in Figure 6 which represents the range of perspectives found in Western climate change discourses. At one end of the continuum is an ontological perspective which places people as being subject to ‘nature’, the so-called environmental determinist paradigm. This view, popular until the early twentieth century, was largely discredited for its racist explanations of differences among societies. In its modern form it is sometimes described as environmental pessimism. From this perspective, climate change will indeed result in doom and gloom. At the other end of the spectrum is environmental possibilism, the twentieth century antidote to determinism. From this point of view, humans can overcome any environmental obstacles through their superiority over nature. It is an anthropocentrically optimistic approach in which concerns about negative impacts of climate change are believed to be misplaced. Humans will be able to adapt their way out of climate change trouble, and innovations will reverse the growing GHG concentrations in the atmosphere or find other ways to stop the warming. Between these extremes lie a host of possibilities. For example, it is entirely possible that responses to climate change will be a mix of mobility and immobility for most places, with the relative proportions of those who stay or leave changing as one moves left or right along the spectrum.

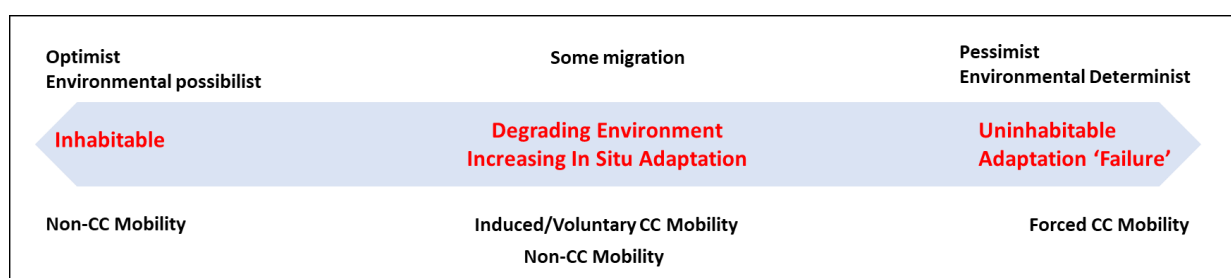


Figure 6. The range of climate change mobility possibilities based on habitability of place and the ontological perspectives associated with them.

Many, perhaps because of a pessimistic bent, may say that while hoping for the best, people must plan for the worst (mass migration and relocation). They argue that mass migration and relocation are highly disruptive at both origin and destination, and the greater the effort that goes into preparation, the better the likelihood of a smoother transition. At the other end of the gamut the view may be to carry on as normal, enable as much adaptation as possible to take place and, if the worst occurs, then depart with little planning or preparation.

It is important to observe here that Pasifika ontologies do not fit into this representation of society–environment interactions as the two are seen as being entwined to such an extent that they mutually constitute each other and are essentially seen as one. If such an ontological approach was more widely adopted, the stalemate between pessimists and optimists would perhaps be avoided and the impasse in international climate change negotiations to some extent offset.

Hope or despair: false hope or false alarm?

This brings us to the point that there can be little doubt that the discourses surrounding the impacts of climate change and the possibility of places becoming uninhabitable forcing abandonment are very upsetting for many people in PICTs and the members of their global diaspora. Are the climate change discourses on the ‘inevitability’ of forced relocation or migration, and of dystopian futures for PICTs, causing significant distress among Pacifica people? An opposing discourse of hopefulness has emerged in which people who are often represented as facing a dangerous future push back against the negative narratives.

One of the dilemmas emerging from this despair/hopeful dichotomy is that successful community relocation or community migration requires long-term planning at both points of origin and destination. But long-term planning risks causing alarm and despair, especially in respect to relational security.

Origins and destinations

This brings us to the issue of home and away being considered as binary opposites and there being a disjuncture between them. Such a view is at odds with Polynesian and perhaps pan Pasifika ontologies, where all people in a community or kinship group are connected by the *vā* (relational space). A challenge for climate change mobility work is to understand the role of the *vā* in climate change induced or forced mobility. Taking this perspective, where would climate change migration fit in? Facing environmental degradation, communities may well coordinate and designate who should stay and who should migrate.

The notion of induced climate change migration is usually applied to individual or family migration as opposed to community relocation which is usually considered to be forced. In many ways induced migration is therefore very similar to existing forms of international migration from and within the region. However, as we have seen, individual migration is not necessarily, or even commonly, about individual decision-making (the core of most migration theorizing), but about decisions made at the wider level, often the extended family or even wider kinship group. There is no reason to assume that climate change would not affect this process. The wellbeing of the extended family may decline with environmental degradation, and decisions to encourage more people to migrate may result. Facilitating climate change migration, should it become necessary, must incorporate such wider groups into decision-making.

Forced or induced: what is the difference?

The idea that climate change mobility may be either forced or induced comes with complications. It implies that when climate effects are ‘really bad’ people may have no option but to move, but if they are ‘just bad’, they may have some kind of choice. In most cases, induced migration is represented as some people leaving an affected community to reduce the pressure of residents on a degrading environment and balancing declining livelihoods for those who remain with remittances. The implication is that if some people did not migrate, severe difficulties would result. In this sense, communities are forced into having some of their members compelled to leave for their community’s continued existence. Rather than promoting community development, it may be suggested that the ‘induced’ climate change migration of the twenty-first century is more for survival and battling to maintain the status quo than development. From this perspective, it may also be seen as forced, as communities may have little choice but to send people away.

The ‘if and when’ dilemma

A systematic literature review by Mortreax et al. (2023) concluded that there is no empirical evidence of climate induced outmigration from atolls ... ‘yet?’ This begs the question of when such outmigration may begin if it does at all. If indeed some form of mobility does become necessary, the next question becomes, at what point does the decision to migrate take place – that is ‘when’. The interactions between migration and/or relocation and **banua* are critical. Most of the climate change relocation in Fiji to date is within customary land boundaries ([PB 132](#)). Communities that are forced to relocate further afield risk losing their connection to their land. But, if they are to re-establish themselves in a new place, that is not their **banua*, they will be causing another (or other) community(ies) to lose some of their land. If relocation is deemed necessary, what procedures (many of them traditional and relational) would need to take place at the points of impending departure and resettlement? Such arrangements, if they are to be least disruptive, are likely to take some time for negotiation and other necessary exchanges and preparations (traditional and contemporary, including financial). Building positive relations between the communities would seem to be an absolute, but time consuming, prerequisite.

In addition, if possible, sustaining the relations with place of origin is also critically important. As noted above, the focus on (un)inhabitability emerged to counter discourses of ‘sinking’ or disappearing islands. The issue of (un)inhabitability remains problematic (Farbotko and Campbell, 2022) but if whole communities were forced to leave, provision may be necessary to support small caretaker groups or facilitate return trips to otherwise abandoned **banua*. For example, would it be possible to have caretaker populations on the original site? Would regular return trips to the **banua* to keep the relationship alive be able to take place? The costs of such actions would need to be included in the adaptation planning and assessment of loss and damage.

Pushing Back: We Don’t Want To Move!

Amidst all of the discourse—planning, political and academic—are the communities and individuals who may be affected by climate change and be either induced or forced to leave

their homes. These communities seem to be being ‘talked over’ and not ‘talked with’. Their relationship to their **banua* is usually ignored in many of these discourses. It is clear from numerous sources that people living on Pacific islands may well be happy to migrate, on their own terms and with the expectation that they may return if they wish – hence the large Pasifika diaspora and growing urban populations in the region, but they do not wish to be forced to move, especially if it entails deserting their **banua*. Several researchers, including those from PICTs, have reported that people have indicated they would rather die, than leave their **banua* (Corcoran, 2016; Falefou, 2017). Equally unsettling for people on these ‘vulnerable’ sites is to be in the midst of debates about the inevitability or not of climate change migration. In order for Pasifika people to be involved, and local voices not drowned out, a more nuanced discourse is required. An important implication of Farbotko and Campbell’s (2022) consideration of (un)inhabitability is the need to place local voices front and centre of climate change work in PICTs as indigenous ontologies need to be prominent in developing appropriate responses to climate change

Climate change and the **banua*

Most of the discussion of the **banua* in this series of PBs has related to its central role in relational security and the consequences for that security if the bond with the **banua* is broken through migration. But climate change may also impact upon the **banua* directly by degrading some of its components. For example, living non-human members of the **banua* may be impacted by environmental degradation with some species potentially being lost. The physical characteristics of the land and nearshore may also be altered with potential for sacred and spiritual sites to be damaged or even lost. What levels of in situ adaptation can be implemented without seriously impacting the **banua*? At what point does the **banua* cease to exist if its components decline or disappear? This is important for those who wish to stay. **Banua* is much more than a set of cartographic coordinates. These considerations again point to the critical importance for local voices to have a salient role in adaptation decision making, be it to remain in place or migrate.

Disasters and displacement

Much work on the links between mobility and climate has centred around the effects of ‘natural’ disasters on population displacement. While much can be learned from such research, there are important caveats. First, it is normal for displaced communities in the Pacific to return to their **banua* after the occurrence of an extreme event that has temporarily rendered their usual place of residence unliveable. But disasters are neither climatic nor ‘natural’ (Wisner et al., 2004). First, extreme events such as tropical cyclones and droughts are strictly speaking single weather events, typical of a given climate. If climate changes, then the pattern (e.g., magnitude and frequency) of such events may change. But any one single event does not necessarily indicate climate change. Historical studies that show people often return after so-called disasters do not really inform us about climate change. Second, severity of disasters is not necessarily a function of natural processes, but of social, economic and political factors. The magnitude of disasters is increasing in the Pacific region mostly because people are becoming more vulnerable as a result of loss of traditional disaster risk management practices, the effects of colonialism

and capitalism, urbanisation and globalisation. Nevertheless, if extreme events do occur with greater magnitude and or with greater frequency, the ability and time to recover between events may be reduced to such an extent that return after displacement becomes difficult and some form of relocation or migration may become necessary

Conclusions

So, what do we make of this brief review of the demography of those who may stay behind in the context of climate change migration?

First, there are several countries where populations are so low that the potential for further outmigration is very limited. Not only are their populations already small, but their fertility is also low and many members of reproductive age groups are no longer living in their home island nation. The numbers of new migrants from these PICTs may be expected to decline.

Second, several countries, many with large and growing populations with small diaspora, have very limited emigration access. They account for almost 90 per cent of the total population of Pacific Island Countries and Territories.

Third, if climate change migration is to create a much larger Pasifika diaspora, it is most likely to come from these much larger Melanesian nations and Kiribati, and perhaps to a lesser extent from countries with existing diaspora such as Samoa, Tonga and Fiji. The latter group already have significant diaspora in Aotearoa New Zealand and Australia.

Fourth, the role of remittances remains unclear. Currently associated with helping *aiga* in the **banua*, the question is to what extent remittances will continue to be significant for future generations. If climate change causes very serious losses as projected, it would be increasingly likely that remittances would do little more than support a static level of wellbeing at home, at best. In addition, diaspora communities may also be adversely affected by climate change. Finally, diaspora communities may need to use their resources to support kin group members who are climate change migrants in the destination countries, making sending remittances home very difficult.

Fifth, the predicted 'explosion' of numbers of 'climate refugees' is likely to be strictly limited by the already relatively small numbers of people living in those PICTs often cited as being among the most vulnerable.

Sixth, if migration and community relocation are to be successful, long-term planning for those who do not migrate—the immobile—is a must.

Seventh, there is relatively little understanding of the social, demographic and economic issues facing depleted island communities in PICTs. It is important that greater effort is made to understand these issues, particularly in the context of ongoing and likely increases in climate change effects.

Eighth, Pacific voices have been largely sidelined in the various discourses relating to climate change in PICTs where non-Pacific actors such as planners, consultants, academics

and researchers have dominated. As a result, the specific complexities of Pacific people–environment relations are sidelined not only by one-size fits all approaches but by discourses that are predominantly western.

Ninth, the uncertainties around climate change and its effects are being steadily reduced as is shown by each successive IPCC assessment report. The same can be said for the effects of climate change on small islands, although the rate of improved understanding of environment impacts is perhaps not progressing at the same pace. However, how communities in small islands might adapt to these changes, and the role that migration might play, still needs a great deal more work. In the absence of certainty, a precautionary approach that doesn't discount any reasonable outcomes will be important.

References

- Barnett, J. (2012). On the risks of engineering mobility to reduce vulnerability to climate change: insights from a small island state. In K. Hastrup & K. F. Olwig (Eds.), *Climate Change and Human Mobility: Challenges to the Social Sciences* (pp. 169-189). Cambridge University Press.
- Barnett, J., & Campbell, J. R. (2010). *Climate change and small island states. Power, knowledge and the South Pacific*. Earthscan.
- Barnett, J., O'Neill, S., Waller, S., & Rogers, S. (2013). Reducing the risk of maladaptation in response to sea-level rise and urban water scarcity. In S. C. Moser & M. T. Boykoff (Eds.), *Successful Adaptation to Climate Change: Linking Science and Policy in a Rapidly Changing World* (pp. 37-49). Taylor and Francis.
- Bedford, R. (2008). Pasifika Mobility: Pathways, circuits and challenges in the 21st century. In A. Bisley (Ed.), *Pacific Interactions Pasifika in New Zealand – New Zealand in Pasifika* (pp. 135-184). Institute of Policy Studies, School of Government, Victoria University of Wellington.
- Bedford, R., & Hugo, G. (2012). *Population Movement in the Pacific: A Perspective on Future Prospects*. Department of Labour.
- Bertram, I.G. and R.F. Watters (1985) The MIRAB economy in South Pacific microstates, *Pacific Viewpoint* 26(3): 497–519.
- Betzold, C. (2015). Adapting to climate change in small island developing states. *Climatic Change*, 133, 481-489. <https://doi.org/10.1007/s10584-015-1408-0>
- Boege, V., & Rakova, U. (2019). *Climate Change-Induced Relocation: Problems and Achievements—the Carterets Case*. Toda Peace Institute.
- Campbell, J. R. (2014). Climate-Change Migration in the Pacific. *The Contemporary Pacific*, 26(1), 1-28.
- Campbell, J. R. (2020). Development, Global Change and Food Security in Pacific Island Countries. In J. Connell & K. Lowitt (Eds.), *Food Security in Small Island States* (pp. 39-56). Springer Nature. <https://doi.org/10.1007/978-981-13-8256-7>
- Campbell, J. R. (2022). From the Frying Pan into the Fire? Climate Change, Urbanization and (In)Security in Pacific Island Countries and Territories. *Peace Review*, 0, 1-11. <https://doi.org/10.1080/10402659.2022.2023425>
- Connell, J., & Brown, R. P. C. (2005). *Remittances in the Pacific an Overview*. Asian Development Bank.
- Corcoran, J., 2016. *Implications of Climate Change for the Livelihoods of Urban Dwellers in Kiribati*. (2016). *Implications of Climate Change for the Livelihoods of Urban Dwellers in Kiribati* University of Waikato]. Hamilton, New Zealand. <https://hdl.handle.net/10289/10442>
- Dornan, M., & Pryke, J. (2017, 10 August 2017). *Foreign aid to the Pacific: an overview*. Devpolicyblog. <https://devpolicy.org/foreign-aid-to-the-pacific-an-overview/>
- Duvat, V. K. E., Magnan, A. K., Perry, C. T., Spencer, T., Bell, J. D., Wabnitz, C. C. C., Webb, A. P., White, I., McInnes, K. L., Gattuso, J.-P., Graham, N. A. J., Nunn, P. D., & Le Cozannet, G. (2021). Risks to future atoll habitability from climate-driven environmental changes. *WIREs Climate Change*, 12, e700.
- Falefou, T. (2017). *Toku Tia Tuvalu and the impacts of climate change* University of Waikato]. Hamilton.

- Farbotko, C. (2010). Wishful sinking: Disappearing islands, climate refugees and cosmopolitan experimentation. *Asia Pacific Viewpoint*, 51(1), 47-60.
- Farbotko, C., & Campbell, J. R. (2022). Who defines atoll 'uninhabitability'? *Environmental Science and Policy*, 138, 182-190. <https://doi.org/10.1016/j.envsci.2022.10.001>
- Farbotko, C., & McMichael, C. (2019). Voluntary immobility and existential security in a changing climate in the Pacific. *Asia and Pacific Viewpoint*, 60(2), 148-162.
- Goldberg, W. M. (2016). Atolls of the World: Revisiting the Original Checklist. *Atoll Research Bulletin*, 610, 1-47.
- Government of Niue. (2016). Niue Intended Nationally Determined Contributions. <https://unfccc.int/documents/497788>
- Government of Tuvalu. (2018). Tuvalu Population and Housing Mini-Census 2017. Preliminary Report. Central Statistics Division, Ministry of Finance, Economic Planning and Industries, Funafuti, Tuvalu.
- Hau'ofa, E. (1993). Our sea of islands. . In E. Waddell, V. Naidu, & E. Hau'ofa (Eds.), *A New Oceania. Rediscovering Our Sea of Islands* (pp. 2-16). School of Social and Economic Development, University of the South Pacific.
- Johnson, G. (2021, 26 November 2021). Marshall Islands census numbers show heavy out-migration. *Radio New Zealand*. <https://www.rnz.co.nz/international/pacific-news/456630/marshall-islands-census-numbers-show-heavy-out-migration>
- Kagan, S. (2016). The Role of Remittances in Risk Management and Resilience in Tuvalu: Evidence and Potential Policy Responses. In A. Milan, B. Schraven, K. Warner, & N. Cascone (Eds.), *Migration, Risk Management and Climate Change: Evidence and Policy Responses* (pp. 175-191). Springer International. <https://doi.org/10.1007/978-3-319-42922-9>
- Kench, P. S., Ford, M. R., & Owen, S. D. (2018). Patterns of island change and persistence offer alternate adaptation pathways for atoll nations. *Nature Communications*, 9(605).
- Le De, L., Gaillard, J. C., & Friesen, W. (2013). Remittances and disaster: a review. *International Journal of Disaster Risk Reduction*, 4(1), 34-43. <https://doi.org/10.1016/j.ijdrr.2013.03.007>
- Le De, L., Gaillard, J. C., & Friesen, W. (2015). Poverty and Disasters: Do Remittances Reproduce Vulnerability? *Journal of Development Studies*, 51(5), 538-553. <https://doi.org/10.1080/00220388.2014.989995>
- Le De, L., Gaillard, J. C., Friesen, W., & Matautia Smith, F. (2014). Remittances in the face of disasters: a case study of rural Samoa. *Environment, Development and Sustainability*, 17(3), 653-672. <https://doi.org/10.1007/s10668-014-9559-0>
- Le De, L., Gaillard, J. C., Friesen, W., Pupualii, M., Brown, C., & Aupito, A. (2016). Our family comes first: migrants' perspectives on remittances in disaster. *Migration and Development*, 5(1), 130-148. <https://doi.org/10.1080/21632324.2015.1017971>
- Lilomaiva-Doktor, S. (2009a). "Migration": Samoan Population Movement (Malaga) and the Geography of Social Space (Vā). *The Contemporary Pacific*, 21(1), 1-32.
- Lilomaiva-Doktor, S. (2009b). Samoan Transnationalism: Cultivating 'Home' and 'Reach'. In H. Lee & S. T. Francis (Eds.), *Migration and Transnationalism. Pacific Perspectives* (pp. 57-71). ANU Press.
- Marshall Islands Economic Policy Planning and Statistics Office (EPSSO). (2012). Republic of the Marshall Islands 2011 Census report. Pacific Community (SPC).

- Marshall Islands Economic Policy Planning and Statistics Office (EPSSO). (2022). Republic of the Marshall Islands 2021 Census report. Volume 1: Basic tables and administrative report. Pacific Community (SPC).
- Macpherson, C., & Macpherson, L. a. (2009). Kinship and Transnationalism. In H. Lee & S. T. Francis (Eds.), *Migration and transnationalism*. Pacific Perspectives (pp. 73-90). ANU Press.
- McDougall, D. (2017). Lost passports? Disconnection and immobility in the rural and urban Solomon Islands. *Journal de la Société des Océanistes*, 144-145, 63-76.
- McLean, R., & Kench, P. (2015). Destruction or persistence of coral atoll islands in the face of 20th and 21st century sea-level rise? *WIREs Climate Change*, 6, 445-463.
- Monnereau, I., & Abraham, S. (2013). Limits to autonomous adaptation in response to coastal erosion in Kosrae, Micronesia. *International Journal of Global Warming*, 5(4), 416-432.
- Mortreux, C., Jarillo, S., Barnett, J., & Waters, E. (2022). Climate change and migration from atolls? No evidence yet. *Current Opinion in Environmental Sustainability*, 60, 101234. <https://doi.org/10.1016/j.cosust.2022.101234>
- Nunn, P. D., & Campbell, J. R. (2020). Rediscovering the past to negotiate the future: How knowledge about settlement history on high tropical Pacific Islands might facilitate future relocations. *Environmental Development*, 35, 100546.
- Petrou, K., & Connell, J. (2017). Food, Morality and Identity: mobility, remittances and the translocal community in Paama, Vanuatu. *Australian Geographer*, 48(2), 219-234. <https://doi.org/10.1080/00049182.2016.1204671>
- Rakova, U. (2014). The sinking Carteret Islands Leading change in climate change adaptation and resilience in Bougainville, Papua New Guinea. In S. Leckie (Ed.), *Land Solutions for Climate Displacement* (pp. 269-290). Routledge.
- Republic of Kiribati. (2021). 2020 Population and Housing Census. General Report and Results. Republic of Kiribati.
- SPC (Secretariat of the Pacific Community) (2020) Pacific Island Populations: Estimates and projections of demographic indicators for selected years. Noumea, Secretariat of the Pacific Community, <https://prism.spc.int/regional-data-and-tools/population-statistics>.
- Thomsen, P. S., Lopesi, L., & Lee, K. L. (2022). Contemporary Moana Mobilities: Settler-Colonial Citizenship, Upward Mobility, and Transnational Pacific Identities. *The Contemporary Pacific*, 34(2), 327-352. <https://doi.org/10.1353/cp.2022.0055>
- Watson, R., & Nel, E. (2020). Applying development models to small island states: Is Niue a TOURAB country? *Asia Pacific Viewpoint*, 61(3), 551-565. <https://doi.org/10.1111/apv.12276>
- Wisner B., Blaikie, P., Cannon, T., Davis, I. (2004) *At Risk*, 2nd Ed.. London, Routledge.

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