Toda Peace Institute

Policy Brief No. 49 September 2019

Climate Change and Urbanisation in Pacific Island Countries

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Abstract

Rates of urbanisation vary considerably among the 22 Pacific Island countries and territories. Some of the highest percentages of urban populations are in smaller countries while the opposite holds true for the larger states in Melanesia. However, Melanesia boasts the largest urban centres in the region and Melanesian countries tend to have many more towns and cities, reflecting their larger populations and land areas. At the same time the urban atolls of South Tarawa and Majuro boast some of the highest population densities in the world, despite these countries being relatively small. Growth in the number of urban residents has led to the emergence of informal settlements where inhabitants have little security of land tenure and the sites are often on marginal land that is highly exposed to the effects of extreme events such as tropical cyclones, floods and coastal erosion. It is likely that climate change will cause greater numbers of people to migrate to urban areas as their home locations become increasingly less habitable. Many will find themselves again living in exposed locations. Additionally, having little land tenure security, high levels of unemployment or underemployment, crowding, lack of infrastructure (including safe water and sanitation), crime and lack of access to land for food are likely to render many of these migrants vulnerable to the effects of climate change. As climate change continues to unfold, urban areas in the Pacific Islands region may find themselves particularly at risk. Urban planning which takes the likelihood of climate change into account is critically important.

Introduction

Urbanisation is likely to have an important role in the context of climate change. With only a few exceptions, mostly in Papua New Guinea (PNG), urban areas in the region are coastal and likely to be affected by sea-level rise in addition to other climate change effects. Second, it is likely that many climate change migrants (see Campbell, 2019)) are likely to find their way to urban areas because of limited options for relocation, or migration, to rural locations. Third, climate change migrants to urban areas are likely to be among the most exposed and vulnerable to the effects of climate change on the region's towns and cities.

Despite this, urbanisation, and its associated problems, are relatively under researched in the Pacific Island region.[1] In most countries there has been little in the way of policy development to address these issues (Connell, 2017) and even less implementation of what plans and policies do exist (Barbara and Keen, 2017). The links between urbanisation and climate change, with only a few exceptions, have received very little in depth consideration (e.g. UN-Habitat, 2015; McEvoy et al., 2019). This paper seeks to address some of these gaps and explores the possibility or otherwise that conflict in urban areas may be affected by climate change.

Urbanisation in Pacific Island Countries

Pacific islands traditionally had few forms of population settlement larger than villages and urban centres mostly emerged following colonisation. Urban areas during the colonial era were small and typically there was only one colonial administrative centre for each colony. Many of these early towns (especially in Melanesia) were sites of exclusion dominated by colonial elites. Strict rules limited the activities in which indigenous inhabitants could engage, and settlement in urban areas was largely proscribed or discouraged (Storey, 2003; Connell and Lea, 1994). It was not until the 1960s that growth in the size of urban areas began to increase (Connell and Lea, 2002) and this accelerated further as PICs gained independence (beginning with Samoa in 1962). In its early stages, urban migration was typically circular, with migrants returning to their home villages after a period of time. More recently, urban migration has become more permanent as communities based on home island, province or village grow in urban areas, kinship networks take on a more urban locus and increasing numbers are born in urban areas (Connell, 2011). While people identify with their place of origin, urban areas are increasingly becoming 'home'.

The degree to which Pacific Island countries have become urbanised varies greatly. While the urban populations of the region as a whole account for less than a quarter of the total population at 23.1 per cent (United Nations, Department of Economic and Social Affairs, Population Division, 2018) this figure is influenced by the large rural populations found in the Melanesian countries, particularly PNG. If PNG is excluded, the average urban percentage for the region moves to 48 per cent, and indeed if we only consider the countries and territories in Micronesia and Polynesia, the urban percentage reaches 55 per cent (based on United Nations, Department of Economic and Social Affairs, Population Division, 2018 data). Despite this, because of its dominating size, PNG boasts by far the largest number of urban inhabitants (over 1 million) and the largest city in the region (Port Moresby). Solomon Islands has the highest urban average annual increase rate at 4.33 per cent per annum (2010 to 2015) which represents a doubling time of only 16 years if it is sustained (based on United Nations, Department of Economic and Social Affairs, Population Division, 2018 data). There are seven countries with urbanisation rates greater than 2 per cent per annum and, of these, four are from Melanesia. Two atoll countries (Kiribati and Tuvalu) are also in this group. Table 1 provides summary statistics on urbanisation in the PIC region. There are several countries with high rates of urbanisation including ten of the 22 with over half their populations in urban areas, although two of the 22 are territories with no urban places at

[1] An exception is Thomas and Keen (eds) 2017. Several articles from this collection are cited in this policy brief.

all. As the table shows, some of the countries with quite low percentages of their population in towns and cities have large absolute numbers of urban dwellers reflecting their overall size. Melanesia, the region with the lowest percentage of urban people (19.4 per cent) accounts for 75 per cent of the urban population of the entire region.

Table 1. Urbanisation in PICs, Summary Statistics, 2018

Country/Region	Population Estimate mid-2018	Urban Population Estimate mid-2018	Per cent of population in urban areas mid-2018	Annual Average Increase rate 2010-2015 (%)	Projected urban population 2050	Projected per cent of population in urban areas 2050 (%)
Pacific Islands Region	**11,739,367**	**2,711,799**	**23.1**	**n.a.**	**5,773,763**	**31.7**
Melanesia	**10,515,806**	**2,038,813**	**19.4**	**2.2**	**4,877,843**	**29.1**
Fiji	912,241	513,116	56.2	1.7	697,673	69.9
New Caledonia	279,821	197,787	70.7	2.1	306,203	81.1
Papua New Guinea	8,418,346	1,108,588	13.2	2.2	3,325,555	24.0
Solomon Islands	623,281	148,021	23.7	4.3	385,392	37.3
Vanuatu	282,117	71,301	25.3	2.7	163,020	34.4
Micronesia	**531,996**	**365,586**	**68.7**	**1.0**	**495,448**	**75.5**
Guam	165,718	157,067	94.8	0.4	186,513	96.8
Kiribati	118,414	64,011	54.1	3.5	125,666	70.6
Marshall Islands	53,167	40,955	77.0	0.8	56,454	85.7
Micronesia (Fed. States of)	106,227	24,117	22.7	0.3	41,230	32.2
Nauru	11,312	11,312	100.0	2.3	11,337	100.0
Northern Mariana Islands	55,194	50,568	91.6	0.2	49,651	94.6
Palau	21,964	17,556	79.9	1.7	24,597	89.2
Polynesia	**691,565**	**307,400**	**44.4**	**0.6**	**400,472**	**49.3**
American Samoa	55,679	48,526	87.2	-0.1	51,518	90.8
Cook Islands	17,411	13,067	75.1	-0.9	14,863	82.8
French Polynesia	285,859	176,757	61.8	1.2	227,666	69.9
Niue	1,624	727	44.8	1.9	1,096	61.4
Samoa	197,695	36,066	18.2	-0.4	52,365	21.5
Tokelau	1,319	0	0.0	0.0	0	0.0
Tonga	109,008	25,215	23.1	0.3	41,654	29.8
Tuvalu	11,287	7,042	62.4	2.6	11,310	77.6
Wallis and Futuna Islands	11,683	0	0.0	0.0	0	0.0

Source: Data extracted from United Nations, Department of Economic and Social Affairs, Population Division (2018). Various files.

As the table indicates, urban growth is expected to continue in all but a few PICs and for many the rates are likely to be very high. Accordingly, by mid-21st Century the region will have an urban population approaching 6 million people (31 per cent of the total population).

Of this number over 80 per cent will be in Melanesia. The urban population of PNG is projected to more than triple to well over 3 million people by this time (still less than a quarter of the total projected population). The methods used for these projections are demographic and based on urban-rural ratios. They do not incorporate possible effects of climate change on rates of urban migration. Whatever the likely numbers of urban inhabitants in the future, it would seem clear that urban considerations need to be accounted for in considering the likely effects of climate change in the Pacific region.

There are now over 50 urban places in the Pacific region with populations exceeding 5,000[2] (compared with 35 at the beginning of the Millennium (Connell and Lea, 2002)). Figure 1. shows the location of the major urban places (with populations over 25,000) and their population sizes. Urban primacy is a characteristic of the urban systems of most PICs. Indeed, the majority have only one urban area, the capital, which was the original colonial administrative centre. Fiji and Papua New Guinea differ in that they each have numerous urban areas but, even in these cases, Port Moresby and Suva (in terms of their greater metropolitan areas) are far bigger than the next sized city.

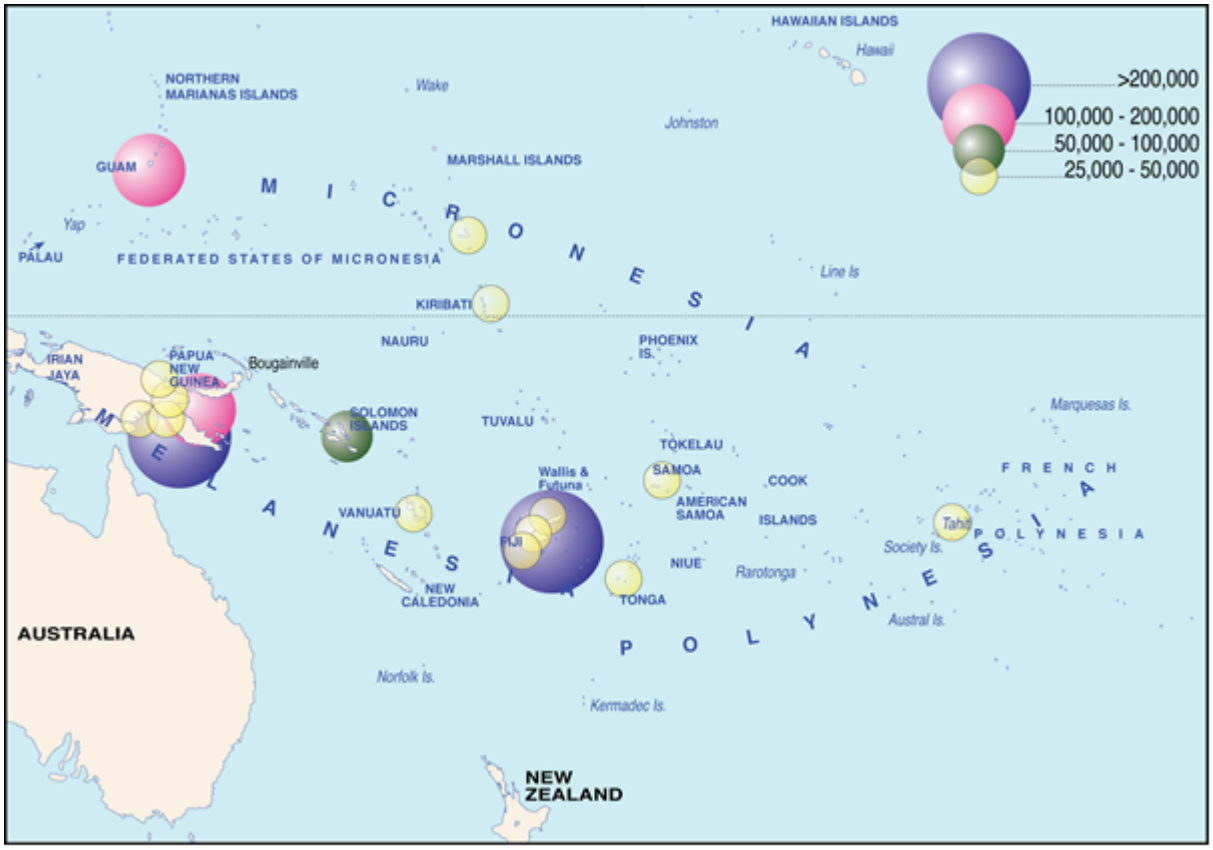

Figure 1. Distribution of Pacific Island urban areas with populations exceeding 25,000. This figure is based on a variety of sources.

[2] Data on urban centres, particularly the smaller ones, is difficult to find, let alone verify and different definitions and terms are used from country to country. Here two internet sources have been used: World Population Review (http://worldpopulationreview.com/countries/) and City Population (https://www.citypopulation.de/). These have been checked against other data where there have been discrepancies. A less conservative estimate would put the number in excess of 60.

Despite this recent growth, urbanisation in the Pacific region is significantly lower than the developing world average, confirming Connell and Lea's (2002) observation that the proportion of Pacific Island populations living in towns and cities is limited.

While Apia may have been the first urban centre established in the region (Connell, 2017) Fiji has a number of towns and cities, several of which have a relatively long history. In 1936, 15,500 persons (7.8 per cent) of a total 198,379 were enumerated in urban areas (Connell and Lea, 2002). At the time of the 2017 census this had grown to 494,252 urban and peri-urban dwellers, accounting for well over half of the national population (Fiji Islands Bureau of Statistics, 2018: 1). Twelve urban areas with populations over 5,000 were identified although several of these combine to form greater Suva. Papua New Guinea also has even more towns and cities, with 23 having populations in excess of 5,000, compared with ten in 1980. Fourteen of these are greater than 10,000. Most have grown in the past two decades or so, although Port Moresby and Lae are by far the largest and have shown the greatest absolute increases in population. Interestingly, unlike the rest of the region, and reflecting PNG's physical geography and size, eight of the towns with over 5,000 people are located inland, mostly in the Highlands.

Informal Settlements in Pacific Urban Areas

As the relatively small colonial administrative centres with commensurate infrastructure expanded, the provision of services did not kept pace. Their spectacular growth in recent decades has given rise to increasing poverty levels (Bryant-Tokalau, 1995; 2012) and informal or squatter settlements in and around the urban areas. As urban populations have grown in the Pacific Islands, pressure has been placed on land resources. The small early administrative towns were often located on land that had been alienated by colonial governments and in some cases, villages were moved to make way for colonial needs. Much of the land adjacent to the towns remained in customary ownership. The original urban boundaries quickly became insufficient to house growing numbers of migrants, many of whom settled on the lands of the original owners. In many cases there were arrangements between the landowners and new urban dwellers, but such arrangements were also often neglected, became brittle or failed to last. Ultimately, customary land is inalienable (see Campbell 2019 for a discussion on the importance of land in PICs) and inhabitants of peri-urban settlements are unable to get finance for home construction and often are discouraged by landowners from establishing 'permanent' structures (McEvoy et al., 2019).

The most recent Census in Fiji (Fiji Bureau of Statistics, 2018) indicates that about 40 per cent of the households in urban areas were in peri-urban areas in 2017 (also see Figure 2 which shows 2007 census data). In the greater Suva area, which has the highest urban population, the number of households in peri-urban areas exceeds a quarter of the total. These figures exclude informal housing within urban boundaries. Port Moresby also has a large number of informal settlements (perhaps as many as 89 on both state and customary land (Jones, 2012a). While informal settlements tend to have greater prominence in the larger countries and cities of the region, they are part of most urban centres. For example, of the 34,427 residents on South Tarawa enumerated in the 2010 Kiribati census, only 8080

persons identified it as their home island, leaving more than three-quarters as migrants from outer atolls or their descendants mostly living in informal arrangements (Kiribati National Statistics Office, 2012). Indeed, the urban atolls of Majuro (Marshall Islands), Funafuti (Marshall Islands) and South Tarawa (Kiribati) have some of the highest population densities in the Pacific region, much of which is fueled by migration.

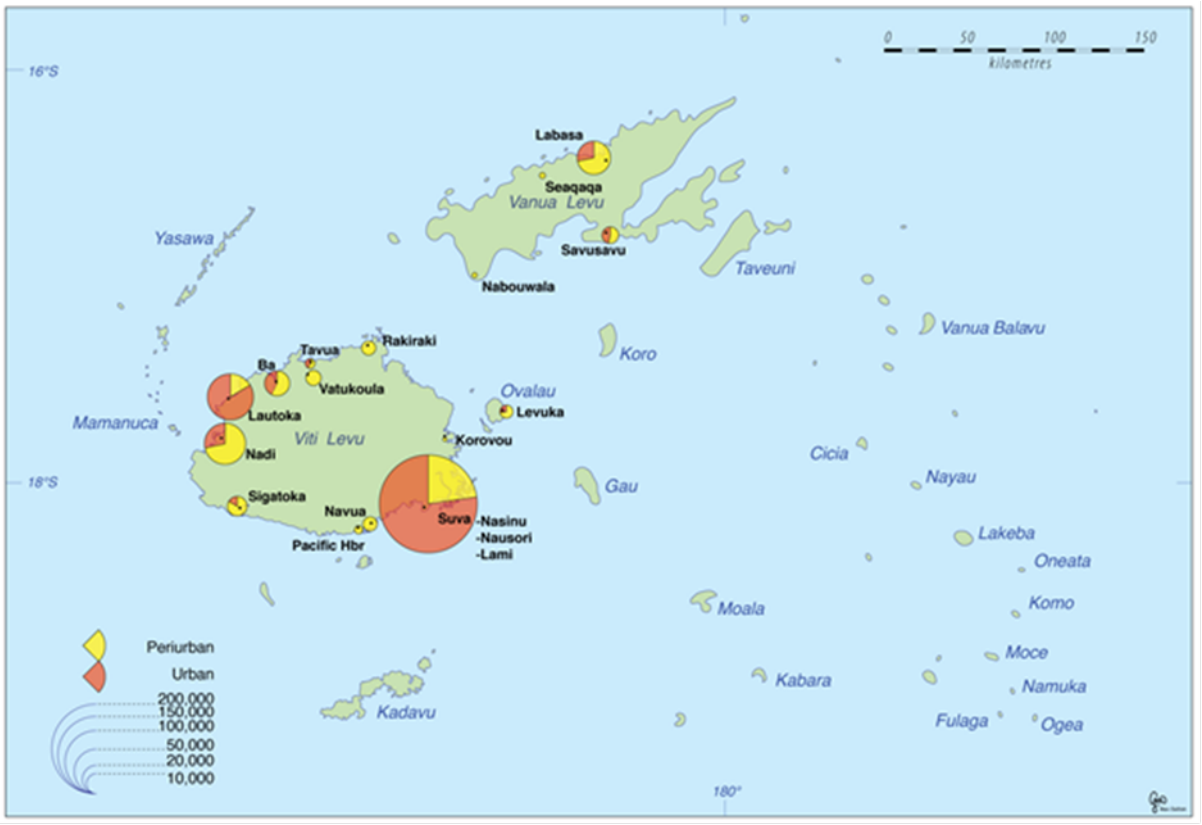

Figure 2. Distribution of urban and peri-urban population in Fiji (Based on data from Fiji Islands Bureau of Statistics, 2007: 7)

Chung and Hill made the following observations on the situation in Vanuatu's urban areas, particularly Vila, in 2002, but they are largely applicable today, and to many other urban areas in PICs:

> 'A large proportion of urban people are forced to live in sub-standard, unhealthy conditions. Uncertain land tenure contributes to the insecurity and other difficulties of squatters. This situation exists largely because of the failure of the urban housing and land markets, in particular:
>
> - The high cost of housing construction;
> - The lack of affordable credit to low and middle income families;
> - The small amount of land for urban housing coming available, in part because of the slow pace of regularising tenure;
> - Insufficient government, and other, funds to implement services;

- Other restrictions on service provision;
- Lack of alternative urban housing that is affordable for low-income households; and
- Poor co-ordination of urban infrastructure planning issues within Government.' (Chung and Hill, 2002, 5)

Some characteristics of informal settlements are likely to expose them to climate change risks compared to communities living within formal urban boundaries. These are summarised in Table 2 and include physical exposure to risk because of site and structure characteristics, neglect by governments and those urban planning authorities that exist within the region (particularly in terms of infrastructure provision), socio-economic disadvantages (e.g. unemployment and underemployment and associated poverty, poor access to health and education, lack of access to food gardens, etc) and lack of political influence (e.g. lack of consultation in relation to urban decision-making). Some informal settlements are characterised by high levels of violence and crime (Jones, 2012b; Rooney, 2017) and there are often tensions between 'squatters' and landowners and between people from different island communities forced to live together in these settlements. Often informal settlements are neglected in post-disaster relief and rehabilitation (for example assistance with rebuilding destroyed homes is limited by lack of land ownership).

Having pointed out these issues it is important to note that many informal settlements have thriving communities, strong kinship networks and connections with home villages, and new social networks based on churches and sports clubs, for example. It is very important not to overlook the capacities and agency of people in informal settlements. While Pacific urban areas, especially those in Melanesia, have been characterised as sites of exclusion, there are also counter processes in which inclusion is an important characteristic (Foukona, 2015; Filer et al., 2017). Many of the people living in these communities have employment based in the informal economic sector often illustrating innovative approaches to providing livelihoods for themselves and their families. It may also be claimed, in a perverse set of circumstances, that people in informal settlements are innovative and resilient because they face such formidable hardships. As a result, they have significant levels of social capital that can underpin resilience (Hukula, 2017; Jones, 2017). However, there has been a growing push back against communities being labelled as resilient when often there is a much more complex interplay between resilience and vulnerability (McDonnell, 2019) or when members are often left struggling after disasters (e.g. Kang, 2018). People in these circumstances often feel that being portrayed as resilient obscures the hardships they are facing. Nevertheless, tapping into, or at least not ignoring, the positive attributes of settlements is an important aspect to take into account when planning for climate change adaptation, especially in the area of building adaptive capacity.

Table 2: Factors contributing to exposure and vulnerability of informal settlement communities

Site characteristics	unstable slopes flood prone areas mangroves river flood plains
Structures	lack of resilience to strong winds poorly ventilated high density
Infrastructure	lack of, or limited, access to: water electricity sanitation transport storm water management (assoc. with floods and slope instability)
Socio-economic	unemployment and under employment lack of, or limited, access to health services education crime violence
Land	lack of title restrictions on building permanent structures inability to obtain financial assistance insecure rights to usage eviction/displacement

Urban Management in Pacific Island Countries and Territories

Some observers have noted much of this very rapid urban population growth has been unmanaged (Jones, 2017) and there are numerous issues facing urban management and planning in Pacific Island Countries. This reflects the many constraints on the development of measures that might address these problems. Connell and Lea (2002) observed that many Pacific Island countries have some kind of planning for urban areas and some of the larger cities have elected councils and municipal governments. However, they also note that there is very limited implementation of the various planning mechanisms that exist. Fifteen years later Barbara and Keen (2017: 16) made the same observation – little has changed.

> Political and institutional arrangements are failing to manage the pressures of rapid urban growth … Key institutions such as municipal councils

> remain weak, reflecting decades of political neglect and under-resourcing … While urban plans and policies exist on paper to direct development, in practice the city is being shaped more by powerful interests which operate relatively unfettered by paper regulations.

The larger Melanesian countries (Papua New Guinea, Solomon Islands, Vanuatu and Fiji) have legislation for land use planning, but the many constraints contribute to relatively little progress. Enforcement is difficult and most Pacific towns and cities are built on (or around) a collection of villages with customary rights to land and their own traditional ways merged with the modernity of the post-colonial city or town. The costs of implementation of urban plans are also high and urban management or government is typically under-resourced and the number of experienced planners is limited. Even in those countries with high urbanisation levels, the association of rural areas with tradition and custom has seen these areas perhaps advantaged in national planning documents. Moreover, there has been a tendency to see the solution to urban problems as lying in improving rural development as a means of stemming the flows of migrants to the towns. Because many urban residents are registered as voters in their rural electorates there is further disincentive for some politicians to tackle urban issues (Commonwealth Local Government Forum et al. 2007: 2).

At the 2003 meeting of the Pacific Regional Workshop on Urban Development, a Pacific Urban Agenda was agreed upon and this was adopted by the Pacific Islands Forum and included in the Pacific Plan (the key regional policy platform for sustainable development). It had three planks:

- Provision of Access to Serviced Shelter which addresses such issues as housing policy, land tenure and land management, housing markets to meet growing demand and building codes.
- Urban Environmental Issues such as provision of infrastructure, integrating environmental and disaster management into urban planning, public health and institutional and legislative frameworks.
- Urban Security including good governance, addressing urban poverty, improving access to livelihoods, reducing vulnerabilities and enhancing individual security. (Pacific Regional Workshop on Urban Management, 2003: 4)

Subsequent meetings do not appear to have engendered the same level of interest and Kiddle et al. (2017) note that progress in advancing the agenda has been slow. Nevertheless, in 2015 a New Pacific Regional Agenda was established with the following key elements:

- Enhancement of social equity (reflecting acknowledgement of the plight of many migrants, especially those in informal settlements),
- Greater emphasis on environmental issues including climate change and natural hazards
- Building urban economies
- Strengthening urban governance (Pacific Urban Forum 2015)

By and large it appears that little has changed although some countries have taken significant steps. For example, Fiji has made advances in housing for people in informal settlements (Kiddle and Hay, 2017) and in Samoa the Planning and Urban Management Agency (PUMA) engaged in a consultative process in developing in The Samoa National Urban Policy which is subtitled 'Sustainable, Resilient and Inclusive City' and includes 'Climate Resilience and Disaster Risk Reduction' as major components (PUMA, 2013).

Climate Change and Urbanisation

Despite the above example, the issue of climate change and urbanisation has by and large not been addressed in detail in most research and policy development on urban areas in the region. Yet, the two are potentially strongly connected. On the one hand climate change is likely to contribute to the flow of migrants to urban areas as a result of induced and forced climate migration. On the other hand, urban areas, especially the informal settlements, are likely to have high levels of both exposure and vulnerability to climate change.

Climate Change as an Urbanisation Driver

As outlined in Toda Briefing Paper No. 37 (Campbell 2019), there are two types of climate change migration: induced migration and forced community relocation (see Table 3 below). Induced migrants are those who choose to migrate because of environmental degradation in their home communities that does not make their places uninhabitable but may render subsistence and cash livelihoods (agriculture and fisheries for example) unsustainable or insufficient to support the whole community. In such cases, to relieve the population pressure on a declining resource base, some individuals (and perhaps their families) may leave with the intention of gaining employment elsewhere and supporting their remaining relatives with remittances. Induced migrants may come from coastal villages affected by sea level rise, but other scenarios are also important. For example, traditional responses to periodic droughts and frosts (usually associated with El Niño events) which decimate sweet potato production in the Papua New Guinea Highlands included temporary resettlement among communities at lower altitudes with whom the famine affected communities had ties (Waddell, 1975). A more likely occurrence in the contemporary setting is outmigration from affected areas to inland urban centres such as Mt Hagen (Jacka, 2019).

Options for induced migrants are likely to be limited. Other rural areas are unlikely to provide stable employment opportunities and access to other groups' customary lands will be difficult. It is likely, then, that the migrants will seek opportunities overseas or in urban areas. For many, urban migration may be the initial stage in stepwise migration to overseas destinations. At present, however, opportunities for international migration are limited for most countries (excepting territories and freely associated states) and almost non-existent for many countries including most of independent Melanesia, Tuvalu and Kiribati. The likelihood, then, is that climate change induced migration will significantly increase the number of migrants to urban areas in the region. This will be most important in the countries with limited international access but also include significant numbers waiting for international opportunities in other countries.

Table 3. Implications of climate change migration for urban settlements

Induced Migration	Individuals and families
	Migrants can return to 'home place
	As visitors
	As longer-term returnees
	Similar to existing migration practices
	Migrants likely to live in settlements with kin relations
	Migrants likely to maintain links to home including remittances
	Migrants able to return (permanently or temporarily) to home site
Forced Migration	Whole communities
	Migrants cannot return to 'home' place
	New settlement forms may be necessary, or
	Resettled communities merge with existing settlements
	Possibly causing (over)crowding
	Existing populations in urban areas no longer have 'home' place to refer to, to visit or return to

As Table 3 shows, patterns of induced migration are unlikely to be significantly different from other forms of migration to urban areas which are often attributed to economic factors although social considerations such as access to schools (especially high schools) are also important. As urban communities consisting of people from a singular place such as an island or village grow, they may come to be larger than the original community. This also creates the possibility that many of the important cultural and social aspects of, for example, village life can be fulfilled within the urban settlement encouraging further urban migration from the source communities. Being able to return to one's land, or simply knowing it is still there, remain important aspects of the ontological security[3] of the migrants. In the case of induced migration, the possibility always exists of a return home and circulation between urban areas and home communities is not uncommon, though increasingly less frequent than in the past (Connell, 2017).

In contrast to induced climate change migration, forced community relocation will occur when a place is no longer habitable and the whole community needs to move. Scenarios include coastal erosion and inundation, salinization of water supplies and garden lands, river flood plain flooding and riverbank erosion. Community relocation could be achieved with least disruption if the community was able to shift to a new site within its customary lands (although no relocation is without some costs). If this is not possible, and if the community is to retain its integrity, a new site would need to be found on another group's customary land. As shown in Campbell (2019) this is fraught with difficulty because of the

[3] Ontological security (e.g. Giddens, 1991) enables individuals to rely on everyday things remaining by and large dependable and providing feelings of continuity, belonging and confidence in their lives. It provides a 'secure base to which [people] can return' (Hiscock et al., 2001: 50) and protection from uncertainty. The concept is discussed in Campbell (2019) where a case is made that land is a critical element in the ontological security of people in PICs.

importance of land to customary owners – most customary land in the Pacific Islands region cannot be bought and sold, or even easily gifted.

It is likely, then, that displaced communities may find themselves with few options other than moving to urban areas where they would be most likely to move to existing informal settlements occupied by their kinfolk. In such cases it is possible that settlements would become increasingly densely populated, and overcrowding and associated problems may result. Tensions may arise over leadership between those from the relocated community and the ones who have become established in the urban areas. There would be no home to return to or even to believe exists and this may have serious emotional and psychological effects. Land issues would still be important. For example, increasing numbers may place pressures on the relationships with the customary owners of the peri-urban lands where many relocated communities may find themselves, with tensions arising and increasing possibilities of conflict and possible eviction.

Climate Change Effects on Urban Migrants

Having 'escaped' from a degrading environment or, at worst, complete loss of habitability of their lands, climate change migrants in urban places are likely to still face both high levels of exposure and vulnerability to climate change. Exposure refers to being in a location or setting that is affected by climate change. In comparison, vulnerability refers to the lack of capacity to avoid harm or losses. Vulnerability includes sensitivity to effects and capacity to cope with, adapt to, or recover from them. From this perspective, exposure refers to being open to the process that has the potential to cause harm and vulnerability refers to the characteristics of the affected system that enable the harm to be sustained. This leads us to consider which elements of a rapidly urbanising Pacific are likely to be vulnerable to the environmental changes to which they may become exposed.

Areas that are likely to be highly exposed to climate change effects include coastal locations, where most urban areas are located; river flood plains (several urban areas have rivers running through them); low-lying areas such as mangrove swamps, estuaries, coastal flats and inter-tidal zones (where informal urban settlements are often located); steep and unstable slopes (often also sites for informal settlements); and atolls (urban centres on atolls have some of the highest population densities found globally – migrants often find themselves located in informal housing close to the shoreline).

Oceanic atolls also present an interesting case as urban population growth has been quite rapid and urban population densities are often very high. Ebeye, an islet in the atoll of Kwajelein has a population of around 15,000 people on just 0.36 km^2 and a population density of more than 40,000 persons/km^2. Majuro, the capital of the Republic of the Marshall Islands has a population of 25,400 but the great majority live in the Djarrit-Uliga-Dalap area (1.32 km^2) with a population density of 19,000 persons/km^2 (sources of data World population review; RMI, Economic Policy, Planning and Statistics Office (EPPSO)). In Kiribati, at the time of the 2015 census, South Tarawa was the home of 56,388 people with a population density of more than 3,500 persons/km^2 (Kiribati National Statistics Office, 2016). Funafuti, the capital of Tuvalu, has a density of 2,400 persons/km^2 and today

accounts for 63 per cent of that country's population[4]. These high population densities on the very low-lying and small land areas have serious implications regarding water supply, waste disposal and living space, let alone food production. These factors all contribute towards urban vulnerability on atolls which, because of their low-lying topography, are particularly exposed to storm surge, heavy seas and high tides.

For vulnerable people and communities in urban areas the outcomes of climate change are likely to be more severe. Some of the most exposed locations, however, will be those that are occupied by informal settlements. In these cases, there will be the confluence of high exposure with high levels of vulnerability. Given that in the scenario presented here, nformal settlements will swell with incoming climate change migrants, people who will have moved from one situation of exposure to the effects of climate change to another may find themselves in a similar predicament to the one they left and, in some instances, conditions may be even worse.

Climate Change, Urbanisation and Security

Exposure and vulnerability to the effects of climate change do not necessarily mean that conflict and violence will automatically follow. However, there is existing evidence that conditions in informal settlements already give rise to increased violence, criminal activity and tensions among migrants and between migrants and landowners. If the numbers of urban migrants, particularly in informal settlements, grow as a result of climate change migration then it can be expected that these issues will increase in incidence as well. In today's environment, security is a growing concern in urban areas. Problems may intensify further if conditions in informal settlements worsen, levels of overcrowding increase, and numbers of unemployed and underemployed become greater.

While there are suggestions that gender-based violence is greater in urban areas, this is not necessarily the case. Studies in Papua New Guinea and Fiji suggest that rates of such violence, while high, are lower in urban than in rural areas (Howe, 2017). However, the effects of climate change may also intensify possibilities for violence, especially in informal settlements where the impacts may be greater. Globally, there is ample evidence that disasters often give rise to increases in conflict including gender-based violence (UN Women Fiji Multi-Country Office, 2018).

Issues around land security are likely to intensify as urban populations grow and this may be exacerbated by climate change migration. As demands for land intensify, rents (informal or otherwise) may be expected to increase. It may become increasingly difficult for climate change migrants to find places where they can establish homes, and others may find themselves evicted in favour of those who can pay higher rentals. For the customary owners of peri-urban lands, pressures are also likely to increase. As their land becomes settled, less is left available for other important activities including land-based subsistence and cash livelihoods. Subsistence food production is important for many Pacific Island families in urban

[4] From the Tuvalu Census of Population and Housing 2017.

areas (Thaman, 1995, 2004). However, access to parcels of food producing land is increasingly difficult for urban migrants and this is likely to increase, with serious implications for food security. Given that many climate change migrants will have limited opportunities for employment, reduced opportunities for subsistence food production in urban settings will be increasingly important. Difficulties such as these are likely to intensify in the aftermath of climatic extremes such as floods, droughts and tropical cyclones. In these circumstances there is considerable potential for increasing resource-based conflict.

Access to fisheries is also an important element of food security. Four significant and interrelated issues confront migrants in this regard. First, as the size and population density of urban areas grow, the pressure on marine and river resources increases significantly and in many urban areas depletion of fish stocks (including shell fish) is a major concern. Second, this is intensified by high levels of marine and river pollution in the urban areas of the Pacific, especially the larger ones. Third, in many settings migrants do not have customary rights to nearshore resources and use of these areas can lead to tensions between the customary holders of these rights and the migrant fishers. Fourth, climate change (including sea level rise and ocean acidification) is likely to cause serious damage to coral reef ecosystems with accompanying reductions in fish availability. Issues around fisheries are likely to add to the food insecurity that many urban climate change migrants might face. This is likely to be particularly difficult for those migrants who have been induced, or forced, to migrate from coastal villages impacted by climate change where fish is a critical component of traditional diets. Informal settlements in coastal areas are also at risk of conflict with customary owners where traditional coastal property rights are legalised (Bryant-Tokalau, 2014) in addition to their exposure to the effects of sea level rise.

It is likely that if climate change migration increases, the migrants will face several problems of security. These include livelihood security, particularly around access to employment and land. Problems are likely to emerge around health and safety. Increased incidence of climatic extremes is likely to increase the numbers of urban fatalities and injuries and food shortage may result in cases of malnutrition in urban settings. Issues around safe water supply and sanitation are already of major concern and are likely to increase under the scenarios considered in this paper. However, reductions in material security are not likely to be the only concerns. As the numbers in informal settlements increase, growing overcrowding problems relating to social insecurity are also likely to increase with changes in social networks and leadership, access to education and social services. In addition, cultural insecurity may result from compromised sense of identity, belonging and place. These all may contribute to loss of ontological security for the migrants (see Campbell 2019).

Conclusions

While there is increasing certainty about climate change and its causes and projections are becoming more focused, its likely effects on people are still relatively poorly understood. Just how many people will become climate change migrants is unknown, indeed it will be difficult to distinguish climate change induced migrants from others motivated by economic or social reasons to live in towns and cities. Similarly, we cannot predict accurately how many communities will be forced to relocate, and of these, how many will seek to re-establish themselves in urban settings. Nevertheless, it is likely that climate change will have

some influence over the flows of migrants to urban areas. It is also likely that climate change will have significant impacts on urban communities, especially those living in marginal locations many of which are sites of informal settlements. As urban populations increase, whether induced by climate change or not, the exposure of larger numbers of vulnerable people to the effects of climate change is going to be an important problem. Planning urban development taking climate change and high rates or urban migration into account will be of critical importance for most Pacific Island countries. The following actions may help in reducing risks facing urban populations in the context of climate change:

- Promote adaptation activities and sustainable development in rural areas.
- Develop measures to provide greater housing security for urban migrants and their descendants.
- At the same time, develop fair and equitable measures to ensure the rights of land-owners in urban and peri-urban areas are upheld.
- Implement land-use planning measures that limit housing development in environmentally exposed areas such as flood plains, tidal zones and unstable slopes.
- Develop measures to assist urban migrants and their descendants to construct resilient residential structures.
- Improve provision of infrastructure and services to all urban areas including peri-urban and informal settlements
- Implement disaster risk reduction policies and actions in urban and peri-urban areas.

References

Barbara, J. and Keen, M. (2017) Urbanisation in Melanesia: The politics of change. In Thomas and Keen (eds) Urban Development in the Pacific, *Development Bulletin*, 78: 16-19.

Bryant-Tokalau, J.J. (1995) The myth exploded: urban poverty in the Pacific. *Environment and Urbanization*, 7(2): 109-129.

Bryant-Tokalau, J.J. (2012) Twenty years on Poverty and hardship in urban Fiji. *Bijdragen tot de Taal-, Land- en Volkenkunde* (BKI) 168(2/3):195-218

Bryant-Tokalau, J.J. (2014) Urban squatters and the poor in Fiji: Issues of land and investment in coastal areas. *Asia Pacific Viewpoint*, 55(1): 54-66

Campbell, J. R. (2019) Climate Change, Migration and Land in Oceania. Policy Brief No 37. TODA Peace Institute, Tokyo.

Chung, M. and Hill, D. (2002) Urban informal settlements in Vanuatu: Challenge for equitable development. Report prepared for Pacific Islands Forum Secretariat and UN Economic and Social Commission for Asia and the Pacific, Pacific Operation Centre, Suva.

Commonwealth Local Government Forum, Economic and Social Commission For Asia And The Pacific, & Pacific Islands Forum Secretariat. (2007). The Second Pacific Regional Workshop on Urban Management, 23-25 April 2007, Nadi, Fiji Islands. Report. Nadi: Commonwealth Local Government Forum, Economic and Social Commission for Asia and the Pacific, Pacific Islands Forum Secretariat.

Connell, J. (2011) Elephants in the Pacific? Pacific urbanisation and its discontents. *Asia Pacific Viewpoint*, 52(2): 121-135

Connell, J. (2017) The urban Pacific: A tale of new cities. In Thomas and Keen (eds) Urban Development in the Pacific, *Development Bulletin* 78: 5-10.

Connell, J., and Lea, J. P. (1994) Cities of Parts, Cities Apart? Changing Places in Modern Melanesia. *The Contemporary Pacific*, 6(2): 267-309

Connell, J., and Lea, J. P. (2002). *Urbanisation in the Island Pacific: Towards Sustainable Development*. London: Routledge.

Filer, C., McDonnell, S. and Allen, M.G. (2017) Powers of Exclusion in Melanesia. In McDonnell, S., Allen, M.G. and Filer, C. (eds) *Kastom, property and ideology: land transformations in Melanesia*. Acton, ACT, Australian National University Press. pp1-55.

Fiji Islands Bureau of Statistics. (2007) Statistical News. Press Release 53/2007. Suva, Fiji Islands Bureau of Statistics.

Fiji Bureau of Statistics (2018) 2017 Population and Housing Census Release 1. Age, Sex, Geography and Economic Activity. Suva, Fiji Bureau of Statistics.

Foukona, J. (2015) Urban Land in Honiara: Strategies and Rights to the City, *The Journal of Pacific History*, 50:4, 504-518.

Giddens, A. (1991) Modernity and Self-identity: Self and Society in the Late Modern Age. Polity Press, Cambridge.

Hiscock, R., Kearns, A., Macintyre, S., and Ellaway, A. (2001) Ontological Security and Psycho-Social Benefits from the Home: Qualitative Evidence on Issues of Tenure, Housing, Theory and Society, 2001; 18(1): 50-66.

Howe, S. (2017) Responding to gender based violence in an urban setting: The early story of Femili PNG. In Thomas and Keen (eds) Urban Development in the Pacific, *Development Bulletin*, 78: 67-70.

Hukula, F. (2017) Making a home in the city: Ideas of employment and work. In Thomas and Keen (eds) Urban Development in the Pacific, *Development Bulletin* 78: 45-48.

Jacka, K.J. (2019): In the Time of Frost: El Niño and the Political Ecology of Vulnerability in Papua New Guinea, *Anthropological Forum*, DOI: 10.1080/00664677.2019.1647832

Jones, P. (2012a) Pacific Urbanisation and the Rise of Informal Settlements: Trends and Implications from Port Moresby. *Urban Policy and Research*, 30(2): 145-160.

Jones, P. (2012b) Managing Urbanisation in Papua New Guinea: Planning for Planning's Sake? Alfred Deakin Research Institute Working Paper Series 2, No. 33. Geelong, Deakin University.

Jones, P. (2017) Informal and squatter settlements: The self-made urban order shaping Pacific towns and cities In Thomas and Keen (eds) Urban Development in the Pacific, *Development Bulletin*, 78: 25-29.

Kang, S. (2018) "I Have a Right not to be Resilient": New Orleanians of Color Remember Hurricane Katrina. *The Migrationist. A Collaborative International Migration Blog*. March 2, 2018. https://themigrationist.net/2018/03/02/i-have-a-right-not-to-be-resilient-new-orleanians-of-color-remember-hurricane-katrina/ Accessed 12 August, 2019.

Kiddle, G.L. and Hay, I. Informal settlement upgrading: Lessons from Suva and Honiara. In Thomas and Keen (eds) Urban Development in the Pacific, *Development Bulletin*, 78: 25-29.

Kiddle, G.L., McEvoy, D., Mitchell, D., Jones, P. and Mecartney, S. (2017) Unpacking the Pacific Urban Agenda: Resilience Challenges and Opportunities. *Sustainability* 9(10): 1878. https://doi.org/10.3390/su9101878

Kiribati National Statistics Office (2012) Report on the Kiribati 2010 Census of Population and Housing. Vol 1: Basic Information and Tables. Tarawa, Ministry of Finance and Economic Planning.

McDonnell, S. (2019): Other Dark Sides of Resilience: Politics and Power in Community-Based Efforts to Strengthen Resilience, *Anthropological Forum*, DOI: 10.1080/00664677.2019.1647828

McEvoy, D., Mitchell, D. and Trundle, A. (2019): Land tenure and urban climate resilience in the South Pacific, Climate and Development, DOI: 10.1080/17565529.2019.1594666

Pacific Regional Workshop on Urban Management (2003). Pacific Regional Workshop on Urban Management. Nadi: Pacific Regional Workshop on Urban Management.

Pacific Urban Forum (2015) Towards a New Pacific Urban Agenda. Harnessing Opportunities in a Post-2015 Environment. Nadi, Pacific Urban Forum. http://www.fukuoka.unhabitat.org/projects/pacific_islands/pdf/Towards_a_New_Pacific_Urban_Agenda.pdf. Accessed 10 August, 2019.

Planning and Urban management Agency (PUMA) (2013) The Samoa National Urban Policy. "Sustainable, Resilient and Inclusive City" Apia, Planning and Urban Management Agency, Ministry of Natural Resources and Environment, Government of Samoa.

Rooney, M.N. (2017) Social protection and social safety nets in urban PNG. In Thomas and Keen (eds) Urban Development in the Pacific, *Development Bulletin*, 78: 71-74.

Storey, D. (2003). The peri-urban Pacific: From exclusive to inclusive cities. *Asia Pacific Viewpoint*, 44(3), 259-279.

Thaman, R.R. (1995) Urban food gardening in the Pacific Islands: a basis for food security in rapidly urbanising small-island states. *Habitat International*, 19, 209–224.

Thaman, R.R. (2004) Urban Gardening on the Small Islands of the Pacific. UA Magazine, December, 2004.

UN-Habitat (2015) Urbanization and Climate Change in Small Island Developing States. Nairobi, UN-Habitat`

United Nations, Department of Economic and Social Affairs, Population Division (2018). World Urbanization Prospects: The 2018 Revision, Online Edition. https://population.un.org/wup/ Accessed 6 August, 2019.

UN Women Fiji Multi-Country Office (2018) Climate Change, Disasters and Gender-Based Violence in the Pacific. Suva UN Women Fiji Multi-Country Office.

Waddell, E. 1975. "How the Enga Cope with Frost: Responses to Climatic Perturbations in the Central Highlands of New Guinea." *Human Ecology*, 3(4): 249-273.

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