

# Health And Wellbeing And Quality Of Life In The Changing Urban Environment: Challenges And Government Response In Fiji Island

Mumtaz Alam (Corresponding Author)<sup>1</sup>, Mohammed Feroz Ali<sup>2</sup>

<sup>1</sup>Department of Social Sciences, College of Humanities and Education, Fiji National University, Fiji, Email: [mumtaz.alam@fnu.ac.fj](mailto:mumtaz.alam@fnu.ac.fj), (0000-0002-0945-2447)

<sup>2</sup>Lecturer in Education, Department of Sports Science and Education, Fiji National University, Fiji, E-mail: [mferozali6531@gmail.com](mailto:mferozali6531@gmail.com), <https://orcid.org/0000-0002-9980-3182>

## Abstract

With increased worldwide urbanization, the critical relevance of understanding the links between changing urban environments and human health and well-being is becoming more apparent. The science, on the other hand, which underpins the complexity of linkages is still in its infancy. We examine the various forms of health and wellbeing hazards that exist in the urban environment, and their dynamic, ever-changing nature, and show their spatial and socioeconomic dimensions in this study. For this research strategy to advance, a multidisciplinary conceptual framework that goes beyond the current disciplinary disparities in the literature is required. By incorporating health indicators into all policies and instituting integrated system governance, various change concerns might be efficiently addressed by generating health co-benefits. The fundamental principles of urban planning must incorporate health. An introspective investigation based on secondary data from books and publications, websites, web journals, reports, and government organizations. The study's purpose is to critically analyze present and future health policy on Fiji Island considering changing urban environmental challenges and government response.

**Keywords:** Fiji, Health, Livelihood, Quality of Life, SGD, Urbanization and Wellbeing

## I Introduction

Fiji is an island nation with a dispersed population, although it is the most urbanized of all the nations that are made up of islands in the Pacific. Taxation is the primary source of funding for the health industry; nevertheless, historically poor tax collection rates have hampered the health industry's ability to meet its goals and improve patient outcomes for more than twenty years (WHO, 2011). During the time between censuses in 1996 and 2007, the overall Fijian population grew at a pace of 0.7% per year on average, while the Fijian population grew at a rate that was higher than that of the Indo-Fijian population (Kiddle, 2011). Fiji is the Pacific Island nation with the highest percentage of people living in urban settings, with a population that is 51% urban and 49% rural. By the year

2030, it is anticipated that urbanization would account for 61% of the total population (WHO, 2011). Recent years have seen a significant shift in government health policy toward a focus on prevention and promotion of healthier lifestyles. Various approaches, goals, assessments of progress and calls for increased effort have all been made to solve what is widely acknowledged to be a persistent, deep-seated, and intractable issue. These types of difficulties are known as "wicked problems" because they are not amenable to quick fixes, even if any solutions exist (APS, 2007). Wicked problems have complicated causes and therefore sophisticated remedies. Most of these characteristics are starkly obvious in the public health difficulties societies confront, such as combating obesity, alcohol abuse, mental

illness, environmental degradation, etc. (Hunter, 2009).

Researchers are looking into the effects of climate change on both people's health, well-being and Quality of Life in the Changing Urban Environment. The first of these frontiers shows that climate change makes health risks worse by making people more likely to be exposed to extreme weather, temperature extremes, changed food production, water shortages, foodborne and waterborne diseases, changes in air quality, and changes in where disease vectors and transmission happen (Kim et.al, 2022; Tilley, 2022). The physical and social repercussions of delay against illnesses have a disproportionately negative impact on Pacific Island countries due to the region's low resources, making these nations more susceptible to their effects. Because of advancements in contemporary medicine, the health care system has experienced a monumental turning point over the course of the past two decades (Fiji Government, 2015).

## 2 Materials and Methods

This study employed a descriptive analytic approach to define broad concepts associated with health, wellbeing, sustainable development, and quality of life in a rapidly developing urban setting and challenges for the government. It also examines the various international case studies and government initiatives that have utilized modern urban planning concepts and practices to address health concerns and enhance quality of life. Based on these findings, we may draw some conclusions about how to enhance the health and quality of life in urban areas.

## 3 Results and Discussion

Many parts of the globe have seen an increase in mortality and disease because of climate change and the rising trend over the past few decades. The climate health crisis will continue to influence social and environmental determinants of health and wellbeing such as the availability of safe housing, adequate food, breathable air, safe drinking water and sanitation. More than

four times as many natural disasters are now caused by weather since the 1960s (Lomborg, 2020). To protect people's health and wellbeing from climate change's repercussions, McMichael and his colleagues did groundbreaking work in the 1990s and early 2000s by creating templates for performing vulnerability assessments and devising plans for adaptation. Health, wellbeing, and livelihood impacts from climate change and strategies to adapt must be studied under urban environment. Using introspective methodologies, the risks and opportunities associated with climate change and health in the Pacific region are evaluated with rising the urban sprawl. We discuss the findings from these analyses, focus on the most important topics, and sketch out a future road map for health-related adaptation to climate change in the South Pacific (McIver et.al., 2015). Already, people's health and livelihood are being negatively impacted by climate change in many ways, including heatwaves, storms, floods, food system disruption, an increase in zoonoses and mental health issues. Many of the socioeconomic determinants of health, such as wealth inequality and access to health care and social support networks, are therefore being degraded by climate change. These climate-sensitive health risks disproportionately affect women, children, ethnic minorities, low-income groups, migrants/displaces, the elderly, and those with pre-existing conditions (WHO, 2021). The availability of safe medical facilities during extreme weather events is another way in which climate change poses a threat to health systems. In addition, sea-level rise raises the possibility of greater tides, which can damage low-lying coastal regions and perhaps result in massive social unrest (Bhatta et.al., 2015; WHO and WMO, 2012; Gibson et.al., 2020). The Intergovernmental Panel on Climate Change (IPCC) has identified several important grounds for concern over the consequences of climate change that are either extremely severe or cannot be reversed. They evaluate a variety of adaptation strategies, considering constraints, impediments, and adaptive capability, as well as

the interaction of risks and solutions for climate-resilient development (Pörtner, 2022).

### 3.1 Health and well being

The importance of one's health as a cornerstone of overall wellness. However, our physical health is not the only component that plays a role in our total well-being but one of the important components of wellbeing. The world health organization latest data shows that the population of Fiji having at least basic sanitation service is 99.16%. The population with household spending on health greater than 10% of the total household budget which covers SGD 3.8.2 are 0.78%. The population with household spending on health greater than 25% of the total

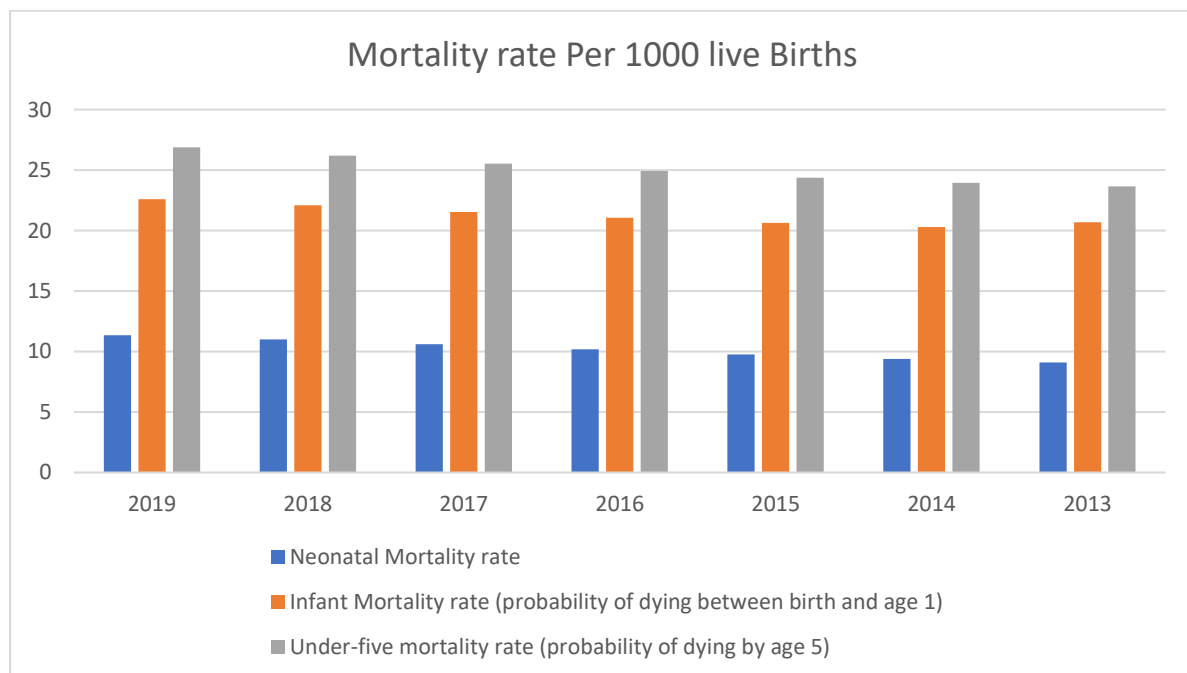
household budget which covers SGD 3.8.2 are 0.11%. To successfully execute the International Health Regulations, 2005 (IHR, 2005), all States Parties are expected to possess or build basic public health competencies. The average of 13 international health regulation core capacity scores, Fiji scored 98 in 2014 (WHO, IHR, 2013). From 2000 to 2019, the global life expectancy at birth grew from 66.8 years to 73.3 years (WHO, 2022). The life expectancy at birth of a population is one of the most significant development indicators since it represents the general health of the people. The decline in mortality rates has increased the likelihood that healthier individuals may live longer. Worldwide, women live longer than men. Likewise, this is true in Fiji (Table 1).

**Table 1: Health and Population life expectancy**

Total Population (Life Expectancy)	74
Male (Life Expectancy)	71.32
Female (Life Expectancy)	76.82
Health Expenditures 2018	3.4
beds/1,000	2
Physicians/1,000	0.86

Source: <https://www.cia.gov/the-world-factbook>

**Table 2: Mortality Rate per 1000 live births**



Source: WHO, The Global Health Observatory Data (2013-2019), Country Profile (Fiji)

Negative effects on mental health and well-being, such as depression and anxiety, have been related to food and water insecurity, and these effects vary by age group and gender (Steel et al., 2009; Weaver and Hadley 2009; Kelman et.al., 2021). Data from several Pacific Island countries (Fiji included) are presented by Kelman et al. to back up the widespread conviction that improvements must be made to our collective approach to mental health care. Adopting local and Indigenous conceptions of health while also combating long-standing stigmas associated with seeking help for mental health and other forms of well-being is essential.

### **3.2 Quality of Life and Urban Environment**

Recent years have seen a surge in interest in the concept of "quality of life," however this is not a concept unique to the 20<sup>th</sup> century. The concept of public policy as a means of fostering "the good life" and "living well" goes back to the time of thinkers like Aristotle (384-322 BC). We must not consider the mere quantity, but also the quality of life which comprises the moral aim," Seth said in 1889, making the first known usage of the term "quality of life" (Marshall and Banister, 2007). Numerous studies have lately addressed the topic of urban quality of life as a solution to the myriad issues plaguing new cities all over the world, including Fiji. The purpose of this study is to define and distinguish between quality of life in the city, urban planning, and related words. Numerous problems plague traditional urban growth, especially that which happened following World War II. These include increased traffic, inadequate services, worsening air quality, a decreased sense of place, segregation in land use, and other non-urban characteristics. Evidently, these problems lower people's quality of life. The quality of life in an area plays a crucial role in the longevity of any urbanization. Planners pay close attention to the desire to enhance the quality of life in a particular area, for a particular person or group (Lotfi and Solaimani, 2009; El Din et.al., 2013). The 2011 Human Development Report adds significantly to the international conversation

about problems by illuminating the fundamental connection between sustainability and issues of fairness, social justice, and the opportunity to improve people's standard of living. The basic argument of this Report is that sustainability is not just an environmental problem. It all comes down to the choices we make every day (Human Development Report, 2011). Planners often focus on improving the quality of life for a specific community, individual, or group. It is no longer sufficient to simply construct more buildings to make cities better places to live; rather, it is necessary to improve transportation, how well people can get their hands on food, water, and shelter; how safe their streets are; how many people live there; what kinds of parks and other public spaces are available; and how densely populated and built-up the area is. upholding public health, safety, and security; advancing literacy and social cohesion; fostering tolerance and understanding across demographics and cultural divides; the improvement of accessibility for people with disabilities; the maintenance of historically significant buildings, neighborhoods, and places of worship; the promotion of spatial diversity and mixed-use of housing and services at the local level in order to accommodate a wide range of needs and desires; and so on are all examples of social values. planners pay a lot of attention to group. Human satisfaction with various urban attributes, such as transportation, public space quality, recreational opportunities, land use patterns, population and building densities, and ease of access to basic goods, services, and public amenity provision, is increasingly important in determining how to improve the quality of life in cities (Alvarez and Muller, 2017; Baobeid et.al.,2021).In addition to the physical features, such as the preservation of historic, spiritual, religious, and culturally significant buildings and districts; the accessibility of those with physical impairments; the protection of public health, safety, and security; education and social integration; the promotion of equality and respect for diversity and cultural identities; and the promotion of spatial diversification and mixed use of housing

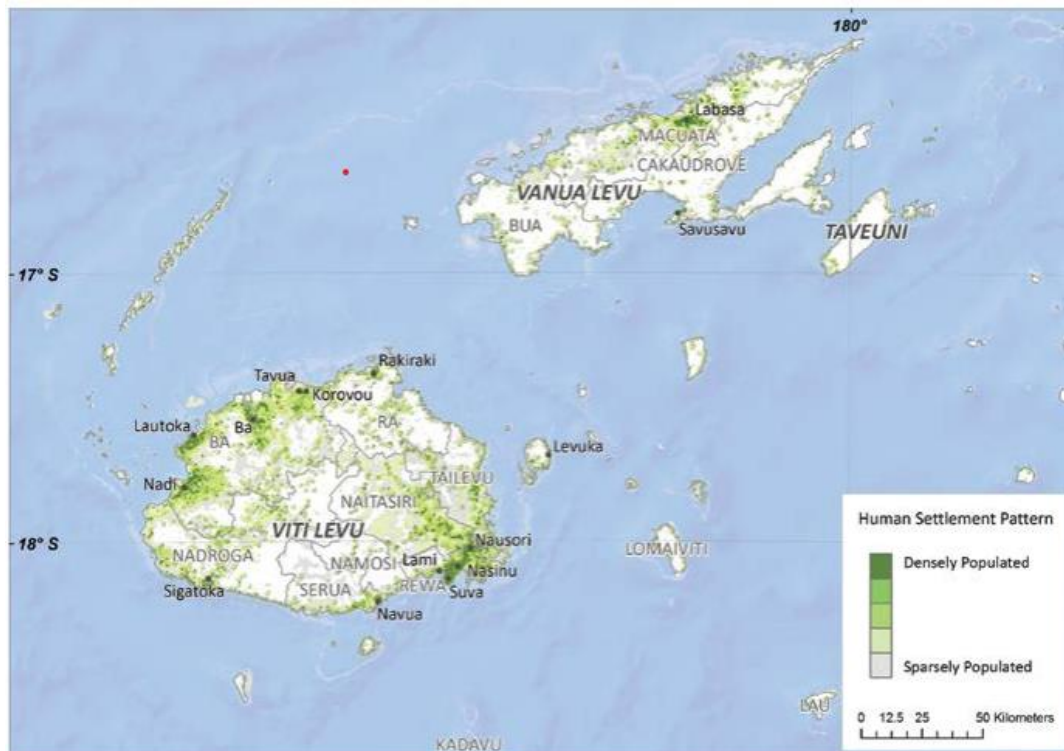
and services at the local level to meet the diversity of needs and preferences, and promotion of culturally responsive design are also important. In addition to environmental qualities like preserving local landscapes and minimizing negative impacts on the surrounding environment, these also deserve special mention (El Din et.al., 2013).

Due to the very similar distribution of non-food expenditures among the families in the original and revised reference groups used to determine the poverty line, Fiji's national poverty line has remained essentially intact (FJ\$ 2179.4 in the original against FJ\$2179.5 in the revision). Estimates of poverty have been revised downward in both urban and rural regions, with reductions ranging from 3.4% to 6.2% for all divisions (World Bank, 2021).

According to the 2019-2020 Household Income and Expenditure Survey conducted by the Fiji Bureau of Statistics, 29.9 percent of Fijians, which is equivalent to approximately 258,000 individuals living in 45,724 households, were living below the Basic Needs Poverty Line of \$41.91 per adult equivalent per week. This

indicates that 30% of Fijians were living below the poverty line in 2019-2020, with the rate of poverty in rural areas remaining significantly greater than in metropolitan areas (FBS, 2020). The Bureau of Statistics estimates that there are 160,450 individuals residing in rural regions who are living in absolute poverty, while there are 97,602 people residing in urban areas who are living in absolute poverty. According to the agency, the rate of poverty was significantly greater in rural regions, standing at 41.5 percent, than it was in urban areas, which stood at 20.4 percent. Furthermore, rural areas were home to 62.2 percent of the poor. According to the estimations and distribution of poverty provided by the bureau, 192,977 i-taukei, 58,933 Indo Fijians, and 6,143 people who belong to the other population makeup are now living in absolute poverty. This indicates that the i-taukei accounted for 74.8 percent of those individuals living in absolute poverty, Indo Fijians accounted for 22.8 percent, and other ethnicities accounted for 2.4 percent. When the survey was carried out between February 2019 and February of the previous year, it was discovered that 134,060 males and 123,992 females were living in absolute poverty at the time (FBS, 2020).

**Figure 1:** Human Settlement patterns in Fiji



**Source:** Climate Vulnerability Assessment: Making Fiji Climate Resilient, The Government of Fiji with Support of World Bank Group ACP-EU National Disaster Risk Reduction Program and GFDRR, October 2017.

<https://documents1.worldbank.org/curated/en/163081509454340771/pdf/Climate-Vulnerability-Assessment-Making-Fiji-Climate-Resilient.pdf>

### 3.3 Fiji's Livelihoods

The society of Fiji is not egalitarian but is instead marked by profound levels of inequality. Even though absolute poverty is uncommon in Fiji, a large percentage of households struggle to fulfill their fundamental requirements of having enough food and a safe place to live, and many are unable to do so at all. Although tradition and community are held in such high esteem, family networks are no longer able to provide enough assistance to some of the neediest and most disadvantaged members of society, if they ever did so at all (Chung, 2019). Above all the fact, Fiji has one of the most advanced economies in the Pacific, owing partly to its strong tourism sector and role as a regional commerce hub. As a direct consequence of this, its service sectors

(including retail, wholesale, accommodation, and so on), along with its manufacturing industries, constitute the bulk of its GDP and employment (World Bank 2017a; NAP 2018). Despite the relatively high GDP and the industrialized economy, there are still problems with people's means of subsistence. Poverty is pervasive, affecting 22% of the population overall, including 29% of the population living in rural areas and 16% of the people living in urban areas (HIES 2015). Subsistence In rural regions, agriculture and fishing are crucial to both the economy and food security since there are fewer alternative possibilities (WFP 2018). Mat weaving is one of the many examples of women's traditional, small-scale, income-generating occupations that need market assistance if they are to survive (Veitayaki et al. 2018). Because of bias and a lack of safeguards in the law, most women's work is unofficial, precarious, and uncontrolled (WFP 2018). Even though the data of 2019 revealed that, 24.1% of the population in Fiji was living below the national poverty level. In the year 2021, just 0.2% of the working people in Fiji lived on less than \$1.90 in purchasing power parity per day. 27 infants out of every 1,000 that were born in

Fiji in the year 2020 did not live to see their fifth birthday (ADB, 2022).

### **3.3.1 Rural Livelihood: Agriculture and Fisheries**

Moreover, a third of Fijians rely on agriculture for their income (ADB 2015). Most people in rural areas must rely on subsistence agriculture and fishing to survive (ADB 2015). Half of all subsistence income is provided by agriculture for those who live in poverty (World Bank 2017a). Crop production, sugarcane, livestock, fishery, and forestry are the five main subsectors within the sector (World Bank 2017b). For a variety of factors, including increased income in non-agricultural sectors (particularly commerce and tourism) and a precipitous drop in the country's crucial sugar output, the agricultural sector's share of GDP has shrunk considerably in recent years (ADB 2015). Historically, agricultural practices were better able to adjust to varying weather conditions. By considering seasonal changes in the land, rivers, and mountains, humans were able to arrange their agricultural and fishing endeavors in a way that did not overtax any one natural resource. People also grew both domesticated and wild kinds, which helped with pollination and led to the development of resilient and adaptable landraces that were later enhanced via the use of communal seed banks (Shah et al., 2018). However, traditional methods and expertise are rapidly vanishing, to be replaced by commercial monoculture systems that are very susceptible to failure. Imported and packaged goods are replacing people's nutrient-dense, fiber-rich, and complex carbohydrate-rich traditional diets with higher amounts of sugar, oil, salt, and refined starch (Shah et al. 2018).

### **3.3.2 Urban Livelihood**

The concept of urban quality of life is burdened with the responsibility of solving urban problems, avoiding environmental harm, and managing urban sprawl. Its goal is to revitalize already-established metropolitan areas while also controlling the emergence of new settlements. The urban population of Fiji, which

made up 54% of the country's population in 2017, relies less on the country's natural resources for their livelihoods and more on financial and knowledge capital. In this context, a household's ability to adjust to climatic shocks is directly correlated to its income level. The sensitivity of those with greater incomes to, for example, changes in rainfall patterns, is lessened; nevertheless, the vulnerability of those with lower incomes is increased, and this has an impact on their homes and possessions, which may be in low-lying regions or in unprotected landscapes. Those who work in the service sector, public administration, construction, and retail in metropolitan areas (both formally and informally) will be affected by climatic impacts such as the danger of heat, which has an influence on the supply of water and the requirement for settings that are cooled. Damages to homes and places of business brought on by urban flash floods brought on by heavy rainfall, as well as coastal flooding brought on by the sea, represent a significant threat to people's means of subsistence (World Bank 2017a).

### **3.4 Government Response and Challenges**

Cities and towns are vital to the country's economy, but the country's infrastructure and services have lagged urbanization. The inadequate wastewater infrastructure has hampered high-density growth, aided in the spread of sprawling cities, and exacerbated environmental deterioration. Poor infrastructure and services pose a serious threat to people's health and the economy, hastening the degradation of the natural world and heightening potential dangers to people's safety. (ADB, 2013). Due to a shortage of reasonably priced, utility-equipped residential property, informal neighborhoods have sprung up in and around major cities. For the past 40 years or more, informal settlements have played a significant role in urban Fijian life. Almost 20% of the urban population resides in informal settlements that present a wide array of physical, legal, and social situations, many of which fall short of

meeting fundamental human rights and are particularly vulnerable to the effects of climate change and health (Ian and Danny, 2016). It was in response to the needs of the growing number of people living in informal settlements that the government of Fiji Thanks to the National Housing Policy that was established in 2011, the Housing Authority has been able to implement multi-phase housing projects, increasing the supply of affordable homes. And there are several national and international organizations that provide funding for such programs (UNHABITAT, 2019). The National Housing Policy for Fiji, which has been in place for ten years, is now being reviewed by the government. Considering the growing frequency with which natural catastrophes strike Fiji, it is essential to create long-term, resilient housing solutions for all inhabitants. The Fijian government passed the act which help in the development plan for the informal settlement and bill stated that “The Development of Informal Settlements Bill 2022 seeks to assist the Government in the development of informal settlements in Fiji by enabling the Ministry of Housing and Community Development as the holder of approximately 40 development leases to compulsorily relocate informal tenants whose dwellings obstruct or are likely to obstruct the development or construction of essential infrastructure such as roads, power lines, water pipes and sewer lines” (Parliament,2022). A sufficient supply of clean, drinkable water is a basic human right, and Fijians should not be denied it. By 2021, everyone in urban areas will have access to clean and safe water; by 2030, the same will be true for people living in rural and marine areas. Government initiatives like the free water program continue to help low-income families ensure their access to safe water. Sites for future dams have been identified along rivers including the Sovi River basin, the upper Waimanu River, and the Waibogi in the upper stages of the Navua River to fulfill the long-term need. Future includes for the identification of further sites in the Western and Northern divisions and the conduct of feasibility studies for the construction of additional dams at those

locations. In this case, we are considering the possibility of developing both water supply and hydropower simultaneously (NDP, 2017). However, 70.1% of Fijian homes had access to piped drinking water in 2017, which is just below the global average of 71%. 30% of families continue to rely on groundwater sources such as boreholes, wells, spring water, and rain collection through communal tanks for drinking and washing. Fiji's National Development Plan explicitly incorporates several targets under SDG6, including ensuring that all citizens have access to clean and safe water in sufficient quantities, increasing the percentage of citizens with access to a central sewerage system from 60% to 70% by 2031, and decreasing the percentage of unaccounted water from 32% to 12% by 2021. Furthermore, Fiji has already achieved ENAP (Every Newborn Action Plan) target. On current trends the stillbirth rate will be 7.8 stillbirths per 1,000 total births in 2030 (UN, 2022).

#### **4 Conclusions**

Health in Fiji will be profoundly affected by climate change. The rising prevalence of noncommunicable diseases including obesity, diabetes, and heart disease may be influenced by the interactions of climate change. For instance, an increase in obesity rates may result from a decline in physical activity and an increase in sedentary lifestyles due to increasingly hot and unpleasant weather. As a result, consumers may be forced to depend increasingly on processed, canned, and preserved food as fresh produce becomes less accessible, which in turn promotes obesity, nutritional deficiencies, and NCD-related disorders. Waterborne illnesses (diarrhea, dysentery, typhoid), as well as vector-borne diseases (Dengue Fever), are also at danger of becoming year-round rather than seasonal health hazards due to climate effects and environmental changes. With the rising tides posing a danger to low-lying areas, some people are considering leaving their homes and moving to safer ground. One source of tension and worry is uprooting from one's traditional way of life and one's ancestors' land and burial sites. The



following concerns were also all highlighted as serious threats due to islanders' unique vulnerability to climate change impacts: fragility of health systems, repercussions on sexual and reproductive rights, mental health issues, and a lack of access to clean water are all issues. According to the data, there is also a rising tide of those over 65, with that percentage reaching about nine per cent. Debt-ridden impacts of Covid 19 and the persistent impact of Climate Change, especially on the main economic sectors, have already hampered attempts in Fiji and other poor nations to achieve any of the SDGs and will continue to do so. The current IPCC Report throws a worrying shadow of climatic variability over the development agenda of, particularly, Small Island Development States (SIDS) like Fiji. Stimulating the economy with strong policies while shielding the most vulnerable with effective social protection systems is the way forward. How should we frame future efforts? Do we still hope that prosperity will increase and "lift all boats"?

## References

1. ADB, 2013, Fiji: Urban Development Planning and Institutional Capacity Building, <https://www.adb.org/sites/default/files/project-document/79548/47237-001-tar.pdf>
2. ADB. (2022). Fiji: Poverty, <https://www.adb.org/countries/fiji/pove-ty#>
3. Alvarez, A., & Muller-Eie, D. A. N. I. E. L. A. (2017) Quality of Urban life and its relationship to spatial conditions, in Brebbia, C. A., & Sendra, J. J. (Eds.). *The Sustainable City XII* (Vol. 223). WIT Press.
4. Australian Public Service. (2007) *Tackling Wicked Problems: A Public Policy Perspective*. Canberra: Commonwealth of Australia.
5. Baobeid, A., Koç, M., & Al-Ghamdi, S. G. (2021). Walkability and its relationships with health, sustainability, and livability: elements of physical environment and evaluation frameworks. *Built Environ*, 7, 721218. <https://doi.org/10.3389/fbuil.2021.721218>
6. Bhatta, G. D., Aggarwal, P. K., Poudel, S., & Belgrave, D. A. (2015). Climate-induced migration in South Asia: Migration decisions and the gender dimensions of adverse climatic events. *Journal of Rural and Community Development*, 10(4).
7. Chung, M. (2019). The Fiji poverty report. [https://openresearch-repository.anu.edu.au/bitstream/1885/157530/1/132\\_fiji-poverty.pdf](https://openresearch-repository.anu.edu.au/bitstream/1885/157530/1/132_fiji-poverty.pdf)
8. El Din, H. S., Shalaby, A., Farouh, H. E., & Elariane, S. A. (2013). Principles of urban quality of life for a neighbourhood. *HBRC journal*, 9(1), 86-92. <https://doi.org/10.1016/j.hbrcj.2013.02.007>
9. FBS, 2020, Household Income and Expenditure Survey. <https://www.statsfiji.gov.fj/>
10. Fiji Government. (2015). National Wellness Policy, Government of Fiji, <https://www.health.gov.fj/wp-content/uploads/2018/03/National-Wellness-Policy-for-Fiji.pdf>
11. Gibson, K. E., Barnett, J., Haslam, N., & Kaplan, I. (2020). The mental health impacts of climate change: Findings from a Pacific Island atoll nation. *Journal of Anxiety Disorders*, 73, 102237. <https://doi.org/10.1016/j.janxdis.2020.102237>
12. Hunter, D. J. (2009). Leading for health and wellbeing: the need for a new paradigm. *Journal of Public Health*, 31(2), 202-204.
13. Ian Hay and Danny South combe, 2016, Fiji Informal Settlement Situation Analysis, People's community Network. <https://center4affordablehousing.org/wp-content/uploads/2019/01/Fiji->

- [Informal-Settlement-Situation-Analysis-Peopls-Community-Network-345199.pdf](#)
14. IHR, 2005, International Health Regulations 2005 monitoring framework, WHO.
  15. Kelman, I., Ayeb-Karlsson, S., Rose-Clarke, K., Prost, A., Ronneberg, E., Wheeler, N., & Watts, N. (2021). A review of mental health and wellbeing under climate change in small island developing states (SIDS). *Environmental Research Letters*.
  16. Kiddle, G. L. (2011). Informal settlers, perceived security of tenure and housing consolidation: Case studies for urban Fiji.
  17. Kim, H., Ryan, A., Harding, A. B., Moskowitz, A. F., Passe, A. I., & Kawazu, E. C. (2022). Health Risks of Climate Change in the 21 Pacific Island States and Noted Gaps in Scientific Evidence: A Scoping Review. *The Journal of Climate Change and Health*, 100166.  
<https://doi.org/10.1016/j.joclim.2022.100166>
  18. Lomborg, B. (2020). Welfare in the 21st century: Increasing development, reducing inequality, the impact of climate change, and the cost of climate policies. *Technological Forecasting and Social Change*, 156, 119981.
  19. Lotfi, S., & Solaimani, K. (2009). An assessment of urban quality of life by using analytic hierarchy process approach (case study: comparative study of quality of life in the North of Iran). *Journal of Social Sciences*, 5(2), 123-133.
  20. Marshall, T. S., & Banister, D. (2007). Achieving Sustainable Cities with Integrated Land Use and Transport Strategies. *Land Use and Transport: European Perspectives on Integrated Policies*, 37.
  21. McIver, Lachlan, and Hanna, Elizabeth (2015) Fragile paradise: health and climate change in the South Pacific. In: Butler, Colin D., Dixon, Jane, and Capon, Anthony G., (eds.) *Health of People, Places and Planet: Reflections based on Tony McMichael's four decades of contribution to epidemiological understanding*. Australia National University Press, Acton, ACT, Australia, pp. 337-350.)
  22. NDP, 2017, National Development Plan: Transforming Fiji, Ministry of Economy, Republic of Fiji.  
<https://www.fiji.gov.fj/getattachment/15b0ba03-825e-47f7-bf69-094ad33004dd/5-Year-20-Year-NATIONAL-DEVELOPMENT-PLAN.aspx>
  23. Parliament, 2022, Bill No 22, Development of informal settlement.  
<https://www.parliament.gov.fj/bills/bill-no-22-development-of-informal-settlement-bill-2022/>
  24. Pörtner, Hans-Otto, Debra C. Roberts, H. Adams, C. Adler, P. Aldunce, E. Ali, R. Ara Begum et al. "Climate change 2022: Impacts, adaptation and vulnerability." IPCC Sixth Assessment Report.
  25. Steel, Z., Chey, T., Silove, D., Marnane, C., Bryant, R. A., & Van Ommeren, M. (2009). Association of torture and other potentially traumatic events with mental health outcomes among populations exposed to mass conflict and displacement: a systematic review and meta-analysis. *Jama*, 302(5), 537-549.
  26. Tilley, L. (2022). Fiji. In *El Niño Ready Nations and Disaster Risk Reduction* (pp. 183-197). Springer, Cham.
  27. UN. (2022). UN Inter-agency Group for Child Mortality Estimation  
<https://childmortality.org/profile>
  28. UNHABITAT. (2019). Fiji: Greater Suva Urban Profile.

- [https://unhabitat.org/sites/default/files/documents/2019-06/fiji\\_greater\\_suva\\_urban\\_profile.pdf](https://unhabitat.org/sites/default/files/documents/2019-06/fiji_greater_suva_urban_profile.pdf)
29. Weaver, L. J., & Hadley, C. (2009). Moving beyond hunger and nutrition: a systematic review of the evidence linking food insecurity and mental health in developing countries. *Ecology of food and nutrition*, 48(4), 263-284.
  30. WHO and WMO. (2012). Atlas of health and climate, World Health Organization and World Meteorological Organization. <https://www.who.int/publications/i/item/9789241564526>
  31. WHO. (2022). World health statistics report: Monitoring Health for SDGs, <https://apps.who.int/iris/rest/bitstreams/1435584/retrieve>
  32. WHO, IHR, 2013, International Health Regulations 2005 monitoring framework
  33. WHO, The Global Health Observatory Data (2013-2019), Country Profile (Fiji)
  34. World Health Organization (2021), [Climate change and health \(who. int\)](https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health)
  35. World Bank (2017a) Climate vulnerability assessment: making Fiji climate resilient. Washington, D.C. <https://documents.worldbank.org/curated/en/163081509454340771/pdf/Climat-e-vulnerability-assessment-making-Fiji-climate-resilient.pdf>
  36. World Bank, 2021 , Fiji Poverty Revision Statement, <https://thedocs.worldbank.org/en/doc/592481a9b487107114a733bce2d6bc44-0070012022/original/220425-WB-Statement-FijiPovertyRevision-final.pdf>
  37. World Health Organization. (2011). The Fiji Islands health system review. WHO Regional Office for the Western Pacific. [https://apps.who.int/iris/bitstream/handle/10665/207503/9789290615439\\_eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/207503/9789290615439_eng.pdf)
  38. Climate Vulnerability Assessment: Making Fiji Climate Resilient, The Government of Fiji with Support of World Bank Group ACP-EU National Disaster Risk Reduction Program and GFDRR, October 2017. <https://documents1.worldbank.org/curated/en/163081509454340771/pdf/Climat-e-Vulnerability-Assessment-Making-Fiji-Climate-Resilient.pdf>
  39. NAP (2018) Republic of Fiji National Adaptation Plan: A pathway towards climate resilience. Suva, Fiji: Government of the Republic of Fiji. [https://www4.unfccc.int/sites/NAPC/Documents/Parties/National%20Adaptation%20Plan\\_Fiji.pdf](https://www4.unfccc.int/sites/NAPC/Documents/Parties/National%20Adaptation%20Plan_Fiji.pdf)
  40. WFP (2018) Food Security in Vulnerable Islands - A Regional Food Security Atlas of the Pacific. <https://docs.wfp.org/api/documents/WFP-0000071751/download/>
  41. Veitayaki, J., Ledua, E., Nakoro, A., Hong, H. P., Han, D. P., Moon, S., & Breckwoldt, A. (2018). Future use of past practices: policy implications of insights from two community-based marine resource management initiatives in Fiji. *Ocean Yearbook Online*, 32(1), 376-405.
  42. Shah, S., Moroca, A., & Bhat, J. A. (2018). Neo-traditional approaches for ensuring food security in Fiji Islands. *Environmental Development*, 28, 83-100. <https://doi.org/10.1016/j.envdev.2018.11.001>
  43. World Bank (2017b) Systematic Country Diagnostic 2017 Fiji. 116491-FJ. Washington, DC.: The World Bank. <https://documents1.worldbank.org/curated/en/529271512123603244/pdf/116491-revised-PUBLIC-ACS.pdf>