

Original Article

An Overview of the Question of Environmental Sustainability in the Face of Urbanization and Climate Change in the Melanesian Region of the South Pacific

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Abstract - Melanesian countries are at the forefront of climate change. The region is experiencing rapid environmental degradation as a result of unregulated human interference, primarily by powerful corporations with strong political ties. The construction of infrastructures such as roads and dams, as well as the extraction of natural resources (forest products) and mineral resources, have destroyed vast areas of forest vegetation without regard for the lives and values sacred to the Melanesian community. All of this has resulted in a plethora of issues ranging from social conflicts to health issues to environmental challenges, such as the destruction of river systems, agricultural farms, and pollution of both air and water. Above all, the effect of climate change due to global warming has made the region vulnerable to sea level rise and habitat loss, including the region's flora and fauna. The paper will discuss briefly the causes of environmental degradation, the challenges posed by climate change, and the need for renewed efforts in the region to achieve a sustainable environment.

Keywords - Urbanization, Climate change, Melanesia, human security.

1. Introduction

Oceania, which includes the islands of Micronesia, Melanesia, and Polynesia, was one of the last regions on Earth to be settled by humans (Wolf, 1992). Melanesia is a subregion of Oceania in the Southwest Pacific comprised of Vanuatu, Papua New Guinea (PNG), the Solomon Islands, Fiji, and the Front de Liberation Nationale Kanak Socialiste (FLNKS). The region's environment is rapidly deteriorating as a result of unregulated human interference and climate change. Since the latter half of the twentieth century, Melanesia has seen an increase in rapid urbanisation, with accelerating social, economic, and environmental changes putting pressure on access to urban land. As a result, in 2010, the four independent Melanesian states had 30-50 percent of their urban populations living in cities (Connell, 2011). Vanuatu and the Solomon Islands currently have the highest urban growth rates in the Pacific, at 2.8 percent and 3.7 percent per year, respectively (Mcarthy and Connell, 2017, 59). Rising population and urbanisation have put pressure on land and coastal areas, resulting in a "coastal squeeze" (Jones, 2011; Bryant-Tokalau, 2014). The Melanesian peoples continue to rely heavily on subsistence farming and other traditional economies, which are both sustainable and ensure an equitable distribution of wealth and opportunity within society. Nonetheless, the region has numerous human security issues, including political insecurity, economic

insecurity, environmental insecurity, and food insecurity, and is appropriately referred to as the "arc of instability."

2. Causes and Effects of Urbanization and Climate Change

Urbanization is the process by which people migrate from rural to urban areas, and it is a universal corollary of modern economic development. According to Chung and Hill (2002, 2), it is viewed as a problem in Melanesian countries due to the failure of urban services and the conflict between modern and traditional law, particularly in the management of land and resources. Melanesia's urbanisation is a colonial legacy, and nowhere else in the world is urbanisation as recent as in the Pacific (Connell and Lea, 1994).

Melanesia is home to approximately 89 percent of the Pacific's total population. Moreover, roughly 24 percent, or 1,824,613 people, live in cities such as Honiara, Port Moresby, Port Vila, and Suva (ADB, 2016, 11). The loss and disappearance of "culturally significant local traditional knowledge about flora and fauna of the region" are threatened by the transformation of natural landscapes as a result of urbanisation, technological advancement, and social and economic conditions (Clarke, 1991).



Mine operations in the region, such as OK Tedi and Porgera in PNG, PT Freeport Indonesia's Grasberg Mine in Irian Jaya, and Ross Mining's Gold Ridge mine in the Solomon Islands, are major causes of deforestation. According to Baines (1989, 282), "commercial logging liquidates a resource may have served a lineage for many centuries, which harbours all of that line's historical links with the past, and which has traditionally been viewed as a resource borrowed from future generations." This is not just an environmental issue but has serious social, cultural, economic, and political ramifications.

The global community is currently dealing with climate change and its consequences, and there is evidence that human activities such as the use of fossil fuels, deforestation, and increased waste emissions from both domestic and industrial processes are responsible for climate change (Wickham et al., 2012, 1). According to conservative estimates, the Melanesian region's annual "gross maritime product" is worth at least US\$ 5.4 billion (Tanzer and Tabunakawai, 2016). However, the estimated average rate of sea-level rise in the Pacific region, at 0.77 millimetres per year (mm/yr) (UN-Habitat, 2015, 9), poses a serious threat to both flora and fauna.

The Pacific island of Tuvalu and some PNG islands are already experiencing heavy storms, which are shrinking coastal areas by 20 cm per year (UN-Habitat, 2015, 10). Climate change was causing more frequent cyclones and floods, which damaged crops and infrastructure, such as the cyclones that hit Honiara and Guadalcanal Island in April 2014, Port Vila, Vanuatu in March 2015, and Fiji in February 2016. The majority of Pacific countries have been classified as "extremely vulnerable" to climate change, and the majority of them are among the world's most vulnerable nations (UNEP, 2014).

In Vanuatu, the significant decrease in crop production is attributed to climate change due to rising temperatures, cyclones, and increased variability of rainfall caused by the El Nio Southern Oscillation (ENSO) and La Nina phenomena (NAPA Vanuatu, 33). Fiji, the most urbanised Melanesian state, has more than half of its population living in cities, with that figure expected to rise to around 60 percent within the next decade (UN-Habitat, 2012). Suva, for example, grew by 5 percent between 2002 and 2010, accounting for 51 per cent of the Fijian population (Phillips and Keen, 2016/6, 4).

Over the last 50 years, Fiji's rural population has declined from 70 percent to less than 50 percent of the total, putting significant strain on urban services (PCCAPHH, 2013, 2). Fiji's environmental challenges related to land resource degradation, hurricanes such as Hurricane Ami (2003), flooding and inundation of coastal settlements, and

unsustainable exploitation of marine resources (Fiji Environment Assessment 2014–2018). Pollution from domestic and urban wastes in coastal areas is a major threat to Fiji's reef systems, affecting atolls spanning over 10,000 square km.

Natural disasters such as Cyclone Ita (GSI, 2014), earthquakes, volcanic eruptions, tsunamis, and tidal waves threaten the Solomon Islands. Furthermore, extractive industries such as commercial forestry, fisheries, large-scale agribusiness, and mining contribute to environmental degradation (Solomon Islands State of Environment Report (SISER), 2008, 52).

Because of its ability to generate waste, urbanisation is a major contributor to environmental change. Honiara's population grew by 2.7 percent per year. However, with the addition of the Tandai and Malango wards, the population rate increased to 4.4 percent per year (Population and Housing Census Report on Migration and Urbanization 2009, 21). Most urban authorities lack the technical capacity and resources to effectively address urban planning and management issues.

Poor service delivery and a lack of urban development can also be attributed to "weak public sector financial management and institutional links, combined with a lack of a national urban vision" (Solomon Islands: National Urban Profile 2012, 8). At least 75 percent of sewage in Honiara flows directly into the sea without treatment (ADB Solomon Islands 2012-2016). Rivers and streams are drying up, and increased sedimentation can be seen as a result of indiscriminate deforestation (SISER, 2008, 61). The Solomon Islands' major environmental issues include: i) unsustainable logging practises, (ii) inappropriate land use practises exacerbated by slash-and-burn and steep-slope farming systems, (iii) unsustainable fishing practises and reef degradation (iv) and extreme weather events caused by climate change (ADB Solomon Islands, 2012–2016).

According to the 2000 National Census, PNG has a population of about 5.2 million people, with 81 percent living in rural areas and 5 percent living in Port Moresby. However, due to high rural-urban migration, urban populations are expected to more than double by 2030, reaching nearly 2 million (PNG National Strategic Plan 2010-2030, 2010, 28 & 84). Furthermore, expanding the port and other development facilities along the shores seriously threatens marine life (PNG UN-Habitat, 2010, 25). PNG's high and low rainfall extremes are also influenced by the ENSO phenomenon. Deforestation is also a major environmental issue in PNG; between 1977 and 2002, approximately 15 percent of PNG's natural rainforest was cleared, with the remaining 8 percent degraded to the secondary forest (PNG NSP 2010-2030, 2010, 94).

New Caledonia has an abundance of both marine and terrestrial resources. However, this biodiversity hotspot is under increasing anthropogenic pressure due to forest fires, urbanisation, and mining. Mining is especially concerning because the island's economy is based on nickel production. Since 1873, open-cast mines have been exploited there, resulting in biodiversity loss (Losfeld et al., 2014).

3. Steps Taken by State, Sub-regional and Regional Organizations

Since urbanisation and climate change pose an imminent threat to the region's environment and biodiversity, a multi-level approach is required, from urban to central, sub-regional to global cooperation. The Melanesian countries should implement land laws to ensure effective land use and environmental management, including drainage and waste treatment, and incorporate the wisdom of traditional ecosystem management (Ministry of Foreign Affairs (MOFA), 2017, 40; Johannes, 1981). The regeneration and rehabilitation of coral reefs, the prevention of algae growth, rainwater harvesting, the use of green technology such as gravel and sand deposition along coastlines, and the use of information technology (internet and social media) to spread awareness and educate the masses all need to be implemented (MOFA 2017,29). Moreover, given the lack of execution and transparency even in the presence of plans and policies on the environment and urbanisation at the state, sub-regional, and regional levels, political will and accountability are required to achieve effective results. However, in recent years, national education authorities in countries such as the Solomon Islands have included local traditional knowledge and land management techniques in the high school curriculum, recognising the cultural, social, and practical values of human interaction with the forest (Clarke, 1991).

Climate change and urbanisation have prompted Melanesian countries to take action. Solomon Islands has National Adaptation Programmes of Action (2008) and a 1998 Environment Act. PNG has a National Climate Compatible Development Management Policy. Fiji has ratified the Barbados Plan of Action from 1994 and the Mauritius Strategy from 2005 to 2015 and initiated the Green Growth Framework. The 2013 Constitution creates a national enabling environment for sustainable development.

At the sub-regional level, the Declaration on Environment and Climate Change, signed on June 1 2012, in Port Vila, Vanuatu, outlines several commitments, including the Melanesian Blue Carbon Initiative and a roadmap for the protection of both inshore and offshore fisheries, recognising the increasing pressures on the sustainability of offshore fisheries throughout Melanesia (IUCN, 2012). The MSG Environment and Climate Change Framework for Action

2020 is a guide for identifying priority areas and potential actions for sub-regional collaboration on the Group's shared vision of the environment, climate change, and sustainable development. It incorporates the four key pillars of the 2012 MSG Leaders Declaration on Environment and Climate Change, namely the Green Growth Framework, the Melanesia Terrestrial Commitment, the Melanesia Blue Carbon Initiative, and the Melanesia Green Climate Fund. The Melanesian Spearhead Group (MSG) Framework for Action on Environment, Climate Change, and Sustainable Development 2025 endorse the MSG 2038 Prosperity for All Plan (MSG Leaders Framework for Action on Environment, Climate Change, and Sustainable Development 2025, 5).

Since securing funds for climate change adaptation and mitigation measures from global sources is complicated, MSG emphasises the importance of coordinating with SPREP to obtain funds (Melanesian Spearhead Group Prosperity for All Plan 2038, 22). It should be noted here that, with the exception of a few concerns and initiatives, the Melanesian Spearhead Group places a greater emphasis on trade, investment, political affairs, and economic and social development, with a secondary emphasis on climate change and environmental challenges.

At the regional level, the Pacific Islands Forum is the preeminent authority in enhancing regional cooperation. The Secretariat of the South Pacific Regional Environmental Programme (SPREP/1992) is the central agency mandated to take the lead on climate change and environmental issues, programmes, and projects such as the Pacific Adaptation to Climate Change (PACC/1999) Programme (Barnett and Campbell, 2010). Furthermore, the emergence of the Pacific Islands Development Forum (PIDF) as an institution that excludes both Australia and New Zealand "will further enhance the development of cohesion in Pacific joint positions on issues regarding sustainable development and climate change" (Tarte, 2014). The Pacific communities signed the Suva Declaration on Climate Change on September 4, 2015, the Pacific Urban Agenda (PUA) in 2003, the Majuro Declaration for Climate Leadership on September 5, 2013, and the Pacific Islands Framework for Climate Change Action, 2006-2015, among other documents aimed at climate change adaptation and mitigation.

Australia and New Zealand are regarded as "big brothers" in their interactions with regional powers, contributing millions of dollars to foreign aid, development, and humanitarian assistance. According to Ramos (2016), as part of its long-term future strategic outlook for a stable and prosperous neighbourhood, Australia's proactive engagement is required to meet regional challenges such as food and water security.

4. Challenges Ahead

Numerous institutional constraints exist, such as a lack of effective environmental management and a failure to deal with the nation's fragility, ethnic tensions, and political instability. Other factors impeding sustainable natural resource management include (i) rapid population growth and urbanisation; (ii) institutional weaknesses in environmental and natural resource management at the national, provincial, and community levels; (iii) policy and legal frameworks that need to be strengthened; and (iv) a lack of effective mechanisms for linking and integrating the customary land tenure system with modern land management systems to foster scalability; (v) a lack of political will and poor governance, which combine to impede environmental rule and regulation enforcement; and (vi) data gaps, which impede effective and informed decision making and planning for sustainable development (ADB Solomon Islands 2012-2016). In Melanesia, public policy primarily focuses on rural development, transportation, and service provision. Policy or action for urban spaces is recurrently lacking, and the social ramifications are poorly understood by national decision-makers or citizens (Mcartney and Connell 2017, 70). To achieve the MSG goals and the respective countries' agendas, continued efforts from local to state, regional forums, and assistance from international actors, including states and UN bodies, are required. Furthermore, in this process, the role of the media in disseminating information about the cause, effect, and need for sustained international attention and cooperation is critical.

The Asian Development Bank (ADB 2012, 222-23) identified numerous constraints to improving urban management, including a lack of urban planning, capacity issues, a lack of skills and knowledge, insufficient human resources such as trained planners and urban managers, and financial resources, a lack of law lands that cater to both traditional and modern social systems, a lack of cross-functional government coordination and integration, and the use of colonial planning systems.

The Pacific countries are widely neglected and lack adequate urban policies, planning, and services. For example, PNG initiated urban management but did not carry out the 2010 PNG National Urbanization Plan (Jones, 2012). Moreover, despite rising electorates, parliament has only a few members. Only Papua New Guinea and Fiji have urban government ministries. Despite the rise in urban issues, "political pressure for better urban management and investment remains muted, allowing unresponsive local and national governments to persist," according to Connell (2011). In the Solomon Islands, for example, only three representatives out of 50 are in parliament in Honiara, which is home to about 15 percent of the population (Craig and Porter, 2014).

The issue of fragmented ethnic identity in urban areas also limits urbanization's success, as narrow ethnic interests are prioritised over collective interests, in addition to a lack of political process and legal rights (Barbara and Keen 2016/9). Municipal councils, for example, often lack the credibility, capability, authority, and resources to manage urbanisation. Because Melanesia has a colonial legacy, unresolved land tenure and equity issues exist. To address these issues, political organisations, civil society, and non-governmental organisations (NGOs) are launching dialogue "to improve equity, address historical wrongs, and alleviate ethnic disadvantage" (Sakai, 2016).

As discussed in this paper, a large portion of low-lying islands is vulnerable to denudation due to sea level rise, with current estimates of at least 1 m of global sea level rise by 2100, resulting in habitat loss (Bellard et al., 2014). However, environmental organisations are "working on a number of different approaches to identify biodiversity patterns, threats, and locations for future acquisition or management" in collaboration with the scientific community (Schmitt, 2011). Although international environmental organisations are concerned with biodiversity conservation, it should be noted that local communities frequently have a diverse set of concerns and interests (Walter and Hamilton, 2014).

Moreover, it must be understood that "climate change is not a single problem, but rather a plethora of intertwined challenges with unique 'attributes, administrative challenges and distinctive political constituencies' mingled with a host of diverse interests from various states and non-state actors" (Keohane and Victor, 2011). Because the Melanesian states face numerous human security issues, they are unable to address urban planning and land and marine resource management. As a result, unregulated settlements are rapidly emerging, and governments are unable to provide basic social services, "producing anarchic, dysfunctional, and partial housing and land markets" (Mcartney and Connell 2017, 71).

Furthermore, the Melanesian states will require additional funding and resources, including proactive public-private community partnerships, to sustain and improve urban management. Local governments must address issues within their capacity while also strengthening the capacity of existing communities and non-governmental organisations (NGOs) to maintain healthy terrestrial and ocean assets that are critical to the region's future.

5. Recommendations

The region is plagued by major issues such as deforestation, climate change, marine pollution, land degradation, invasive species, and water scarcity. These environmental challenges pose serious threats to the

Melanesian region's ecological and social sustainability, necessitating immediate action to mitigate and adapt to their effects. Several strategies can be used to mitigate environmental degradation in Melanesian countries, including 1. Encouraging and promoting sustainable land use practices such as sustainable agriculture, reforestation, and indigenous forestry. 2. Putting in place long-term water management practises, such as encouraging water conservation, reducing water pollution, and investing in infrastructure to improve water access and sanitation. 3. Reducing greenhouse gas emissions by promoting renewable energy, improving energy efficiency, and reducing deforestation and forest degradation. 4. Promoting sustainable tourism through the implementation of ecotourism programmes that promote sustainable tourism practises while

also assisting conservation efforts. 5. Waste management includes waste reduction programmes, improved waste disposal infrastructure, and promotion of recycling and composting. 6. Biodiversity protection through targeted policies and programmes to protect and restore biodiversity, such as protecting critical habitats and implementing measures to prevent invasive species spread. 7. Raising public awareness and education about environmental issues and promoting sustainable practises through public awareness campaigns, environmental education programmes, and community engagement activities. Furthermore, it is critical that these measures be implemented in a socially equitable manner, taking into account the needs and perspectives of various stakeholders such as indigenous communities, local communities, and vulnerable groups.

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