# PACIFIC SMALL ISLAND DEVELOPING STATES
## United Nations Member States

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**Fiji, Marshall Islands, Micronesia (Federated States of), Nauru, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu**

**Views on the Possible Security Implications of Climate Change to be included in the report of the Secretary-General to the 64th Session of the United Nations General Assembly**

## 1. Introduction

On 3 June 2009, the United Nations General Assembly unanimously adopted Resolution A/RES/63/281 inviting "the relevant organs of the United Nations to intensify their efforts in considering and addressing climate change, especially its security implications." It represents the first time that the entire international community has drawn an explicit connection between climate change and international peace and security.

Under the terms of operative paragraph 2, the resolution "requests the Secretary-General to submit a comprehensive report to the General Assembly at its sixty-fourth session on the possible security implications of climate change, based on the views of the Member States and relevant regional and international organizations." The Pacific Small Island Developing States (PSIDS) hereby provide their views and input for the above-mentioned report.

This document outlines the framework as well as the causes and security implications of climate change in the Pacific region and will be complemented by national submissions from the above countries. It lists the security implications that the PSIDS are already experiencing, as well as the security implications they are expected to face in the short and medium term. The combination of economic and geographic vulnerabilities makes the PSIDS especially vulnerable to the security implications of climate change. But, what happens in the Pacific region will be an important lesson for the entire international community. No country, whatever size or stage of development, will be able to avoid the security implications of climate change.

## 2. General description of PSIDS region

The PSIDS are among the smallest and most remote countries on earth. Together they comprise a land area of only half a million square kilometers scattered in the world's largest ocean, with a significant portion of that land made up of low-lying atolls that do not reach more than a few meters above current sea level. Papua New Guinea is the largest of the PSIDS in terms of total landmass (462,840 $km^2$), and population (6.3 million estimated in 2007). The remaining PSIDS are under 20,000 $km^2$, about half are under 1,000 $km^2$ and have populations of less than one million. The

smallest, Nauru, measures a diminutive 21 km$^2$, or about one-tenth the size of Washington, D.C. It has a population of roughly 10,000 people.

The combination of physical characteristics, remoteness and poor infrastructure make the PSIDS inherently vulnerable, and the climate change has a profound impact on PSIDS who face development as well as security issues.

## 3. Security dimension of climate change

There has been a steady evolution of the concept of security within international law and the United Nations Security Council. Since 1990, the Council has dramatically increased its activity in numerous spheres and the number of issues that threaten international peace and security. Among other items, the Council has considered the implications of refugees, HIV-AIDS, the diamond trade, and natural resources on international peace and security.

Traditionally, climate change has been a challenge to the sustainable development of developing countries. Severe weather events, flooding, lack of water and other factors can only be overcome with investment in infrastructure. While the challenges to sustainable development remain, they have become more pronounced as the adverse impacts of climate change have become more dramatic. New factors such as the impacts on health and on human rights have been recognized in the UN system. General Assembly Resolution A/RES/63/281 takes a holistic approach and adds the security dimension of climate change to the discussions. The resolution states, *inter alia*, that the General Assembly is "deeply concerned that the adverse impacts of climate change, including sea-level rise, could have possible security implications."

Each country is affected by climate change differently. To some, climate change will remain a challenge to economic growth and sustainable development. For others, however, climate change has become a matter of survival for the population and the state. In those countries, no amount of sustainable development can protect against the security implications of climate change.

The nexus between security and climate change refers to the implications or obstacles posed by the adverse impacts that substantially interfere with the ability to maintain territorial integrity, sovereignty and independence. As elaborated later in detail, such scenarios have implications for statehood, as well as on international peace and security, in addition to national conflict or instability which rises to the level at which the existence of the nation is threatened. Furthermore, current definitions of security include human security and drivers or threat multipliers of conflict and security, as discussed later in this report.

The relationship between security, development and physical statehood is obvious in an analysis of climate change impacts such as on low-lying atoll nations and their relationship to sea-level rise. Without definition as a distinct and physical sovereign territory, there can be no development or achievement of development goals, for there would be no state with which to associate development.

It is clear that such a complex issue must be addressed holistically and by all the relevant organs of the United Nations as mandated in A/RES/63/281. As such, the Security Council, which under

Article 24(1) of the UN Charter has the "primary responsibility for the maintenance of international peace and security", needs to play its proper role.

## 4. Biophysical impacts of climate change

### 4.1. Rising sea levels

For the Pacific Small Island Developing States, the most fundamental threat to security emanates from rising sea levels that threaten the territorial integrity and sovereignty of PSIDS countries and lead to conflict and unrest over resources and land. Several countries are facing the danger of disappearing entirely.

The Intergovernmental Panel on Climate Change's (IPCC) Fourth Assessment Report (AR4), released in 2007, analyzed a range of scenarios relating to $CO_2$ equivalent emissions, and concluded that, excluding the rapid loss of ice from the Greenland and Antarctic ice sheets, sea-level rise between approximately 18 and 59 cm may occur by 2100.

Such sea-level rise has serious implications such as inundation, erosion, saltwater intrusion and intensified storm impacts. which threaten the viability and existence of small island nations. If the loss of ice from the Greenland and Antarctic ice sheets which is occurring at a rate much faster than previously predicted, is taken into account, the outlook becomes even grimmer. It is clear from the most recent science that sea level rise over the next century is likely to be significantly higher than that projected in the AR4.[1]

Today, sea-level rise is occurring at rates faster than existing models can account for, particularly the accelerating loss of ice from the West Antarctic ice sheet and Greenland. If the loss continues at its current rate, it portends sea-level rise of one meter or more by 2100. Recent projections and estimates of sea-level rise in the next century strongly suggest that one meter or more is possible if not likely by 2100.[2] Beyond 2100, recent science looking at the relationship between Antarctic temperatures and global sea level over the last 520,000 years indicates that multi-meter increases over the next several centuries are very likely from warming of just two degrees Celsius due to the loss of ice from the ice sheets.[3]

In 1990, on the basis of scientific knowledge available before the IPCC First Assessment Report was concluded, the WMO/ICSU/UNEP Advisory Group on Greenhouse Gases (AGGG) produced an analysis of "targets and indicators" for climate change to develop long-term risk management targets. Levels of lower risk included a maximum rate of sea-level rise of 20mm/decade, which

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[1] Rahmstorf, S. A Semi-Empirical Approach to Projecting Future Sea-Level Rise, *Science* **315**, 368-370, doi:10.1126/science.1135456 (2007); Pfeffer, W. T., Harper, J. T. & O'Neel, S. Kinematic Constraints on Glacier Contributions to 21st-Century Sea-Level Rise, *Science* **321**, 1340-1343, doi:10.1126/science.1159099 (2008); Rohling, E. J. et al. High rates of sea-level rise during the last interglacial period, *Nature Geoscience* **1**, 38-42 (2008).

[2] Rahmstorf, S., ibid; Pfeffer, et al, ibid.

[3] Rohling, E. J. *et al.* Antarctic temperature and global sea level closely coupled over the past five glacial cycles. *Nature Geoscience* **2**, 500-504 (2009).

"would permit the vast majority of vulnerable ecosystems, such as natural wetlands and coral reefs to adapt with rates beyond this leading to rapidly rising ecosystem damage." Targets of higher risk included a maximum 50 cm sea-level increase above 1990 global mean sea-level, which could "prevent the complete destruction of island nations, but would entail large increases in the societal and ecological damage caused by storms."[4]

If recent projections based on historical observations of sea-level rise and global mean temperature[5] are correct, then a 20 cm increase in sea level could occur by the 2030s and then exceed 50 cm not long after mid-century. Some observers have defined a near-term "tipping point" of irreversible climate change to be within the general range of 10 years.[6]

Present data and science regarding sea-level rise, including that of the IPCC, indicates a strong potential for exceeding defined ecosystem thresholds which, for Pacific Small Island Developing States, will envision a range of climate impacts at a scale, magnitude and effect which not only pose development barriers, but which also have security implications that undermine the essential structural order of many Pacific SIDS and, for some, their physical existence.

Rising sea levels have left and are leaving salt deposits in the soil and contaminants in the groundwater supply. Both of these have adverse impacts on agriculture, food and water security.[7] In addition, floods and rogue waves raise the saltwater table under atolls, poisoning staple crops. Already some farmers have been forced to grow their taro in tin containers. Additionally some of the smaller islands in the atolls have lost their coconut palms to saltwater intrusion.

Rising sea levels and increased coastal erosion are also causing saltwater intrusion into the groundwater supply. Saltwater intrusion into underground water aquifers will be an especially serious problem for atoll islands,[8] which are permeable and prone to flooding from within. Reliable access to freshwater, which often comes from groundwater supplies, is a necessary prerequisite for ensuring not only food security and water security but also a well-functioning public health system. For PSIDS, securing adequate freshwater supplies for drinking, sanitation, and agriculture is a constant challenge and the adverse impacts of climate change are making it more difficult.

### 4.2. Changing weather patterns and natural disasters

PSIDS are more exposed to extreme weather events and climate variability than most countries. The IPCC noted the observation of "consistent warming trends in all small-island regions over the

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[4] Rijsberman, F. J. & Swart, R. J. Targets and Indicators of Climate Change, 1666 (Stockholm Environment Institute, 1990). See also, Hare, W. L. Fossil Fuels and Climate Protection: The Carbon Logic. 90 (Greenpeace International, Amsterdam, 1997).

[5] Rahmstorf, S., ibid at 368-370.

[6] NASA. Danger Point Closer Than Thought From Warming - 'Disastrous Effects' of Global Warming Tipping Points Near, According to New Study (May 29, 2007), (Available at: http://abcnews.go.com/Technology/GlobalWarming/story?id=3223473&page=1).

[7] Intergovernmental Panel on Climate Change. Fourth Assessment Report, Working Group II: Impacts, Adaptation and Vulnerability, Chapter 16, 689.

8 Samoan Ministry of Natural Resources, Environment & Meteorology. National Adaptation Programme of Action, Samoa (December 2005), 12 (Available at: http://unfccc.int/resource/docs/napa/sam01.pdf).

1901 to 2004 period."[9] The increase in temperature and sea-level rise is expected to trigger an increase in natural disasters. The region will experience increasing frequency and severity of extreme events such as heat waves, exceptional rainfall events, summer droughts, tropical cyclones, storm surges, El-Niño conditions, and an increase of weeds, pests and diseases.

Floods and droughts are particularly devastating for small islands. Many islands rely on regular rainfall to recharge limited groundwater resources. When there is too little rain, or too much at one time, these reservoirs are taxed, threatening food and water security. Indeed, Kiribati has recently suffered from a shortage of water that approached disaster levels. Flooding and droughts will render whole islands, particularly low-lying atolls, uninhabitable, leading to their abandonment, migration and conflicts over resources, thus endangering security on the islands.

Low-lying islands offer little refuge to inhabitants from incoming storms and are especially vulnerable to powerful storm surges.[10] Rising sea levels amplify these dangers, propagating storm damage further inland. Flooding from heavy rainfall can produce dangerous mudslides. The weak infrastructure in the PSIDS, including poorly built roads and houses that cannot withstand frequent floods and tropical storms, is incapable of providing shelter and protection to communities when disasters strike. Rebuilding damaged infrastructure is also more difficult and expensive for PSIDS, taxing their limited budgets. A single storm can cripple large portions of an island's economy and leave its people entirely reliant on foreign aid. In 2006, Cyclone Heta struck Samoa and Tonga and devastated Niue. In absolute numbers, natural disasters will increase both in frequency and severity in the Pacific. Given the vulnerability of PSIDS, a single extreme weather event can suddenly exceed a nation's capacity to respond, thus endangering national security, as well as international peace and security.

### 4.3. Soil erosion

For PSIDS with limited land and resources, soil erosion is a critical problem. In Micronesia, particularly in Pohnpei, forest cover decreased due to climate change from 15,000 hectares in 1975 to 5,200 hectares in 1995 to 4,200 hectares in 2002.[11] Overuse of Nauru's freshwater lens during the Pacific drought between 1998 and 2001 has created the added difficulty of contaminated groundwater.[12] Viti Levu, Fiji, a relatively high island, could face agricultural loses of up to $52 million by 2050 if adaptation measures are not taken.[13] Soil erosion in addition to the factors listed above will endanger the food and water supply of the PSIDS and render whole islands, especially low-lying atolls, uninhabitable.

### 4.4. Loss of coral reefs

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[9] IPCC AR4, ibid at 691.
[10] IPCC AR4, ibid at 689.
[11] FSM Strategic Development Plan 2004-2023, Vol. 1, 116-117, (Available at: http://uscompact.org/files/FSM%20Publications/Background%20Documents/Strategic%20Development%20Plan/FSM%20SDP%20Vol%201.pdf).
[12] SPREP. Pacific Adaptation to Climate Change – Nauru – Report of In-Country Consultations (June 29, 2009), 18, (Available at: http://www.sprep.org/climate_change/PACC/reports_detail_country.asp?id=664).
[13] IPCC AR4, ibid at 698.

Rising sea surface temperatures lead to coral bleaching, while the absorption of $CO_2$ by the ocean causes it to become more acidic.[14] Rising sea surface temperature and ocean acidification are progressively reducing the biological and structural complexity of coral reefs and the biodiversity within the ocean. This could lead to the collapse of entire reef ecosystems, thus limiting or even eliminating access to critical food sources and endangering the biodiversity of the Pacific Islands.

The region has already experienced some loss of hard coral due to calcification and erosion, affecting many species of fish relying on coral for existence. In Nauru, for example, corals presently survive near the limits of their temperature tolerance of 25°C to 29°C. Any increase in sea surface temperature may result in coral bleaching and loss of coral species, reef habitat and reef building processes.[15]

The destruction of coral reefs directly threatens the physical boundaries and security of the Pacific islands, and poses serious food security risks to islands that rely on agriculture and fisheries as their main food sources. Because reefs form a natural, physical barrier that protects the coastline from severe weather events, their destruction, combined with rising sea levels, causes sea water to infiltrate farmland as well as lead to coastal erosion.

## 5. Security implications of climate change

### 5.1. Food security

Many countries, including most PSIDS, are highly dependent on subsistence fishing and agriculture for the bulk of their food supply. The adverse impacts of climate change are threatening both,[16] particularly through floods, droughts, soil erosion and the loss of coral reefs.

Biodiversity loss is yet another pressure. The 2005 Millennium Ecosystem Assessment estimates that by the end of this century, climate change will be the main cause of biodiversity loss. The IPCC asserts that roughly 20 to 30 percent of species it has assessed are likely to be at increasingly high risk of extinction as global mean temperature exceed pre-industrial levels by 2 to 3° C.[17] This irreversible loss of biodiversity will have serious consequences for global food security. Shortage of food is likely to lead to conflict.

#### *5.1.1. Fisheries*

Fish is a major contributor to food security in the Pacific and one of the principal resources for econornic development. Subsistence fishing provides 50%-90% of the animal protein diet of people in rural areas and remote islands and is threatened by the loss of coral reefs, ocean

[14] IPCC AR4, ibid.
[15] Republic of Nauru, *First National Communication under the United Nations Framework Convention on Climate Change*. (1999), 64, (Available at: http://unfccc.int/resource/docs/natc/naunc1.pdf).
[16] IPCC AR4, ibid at 689, 700.
[17] IPCC AR4 Synthesis Report, 48

acidification and rising water temperatures. Coral reefs in particular act as food incubators from where fish and sea creatures receive nutrients.

A gap is already emerging between the fish needed for food security and the fish available from coastal fisheries for many countries in the Pacific region. When combined with population growth, this gap will widen. Changing water temperatures threaten to shift the distribution and supply of tuna, changing its migratory routes and, thus directly impacting the food supply for local communities, whose diets and livelihoods depend on tuna.[18] Moreover island economies that rely heavily on their fisheries for economic development will also suffer.

### *5.1.2. Agriculture*

The security of subsistence agriculture on small islands is also threatened by rising sea levels, which increases the frequency of coastal flooding.[19] Rising sea levels already leave salt deposits in the soil and contaminate groundwater supply, both of which have adverse impacts on agriculture. Climate change is also likely to lead to more frequent and more intense periods of drought in some regions, and increased rainfall in others, which can cause soil degradation.[20] According to the Food and Agriculture Organization, "Climate projections for the future, although coarse for islands, are bleak and indicate reduced food security, especially at household level. The primary food sources (agriculture, fisheries and forests) and water will be impacted by climate change and, in most cases, these impacts will be negative."[21]

Agriculture accounts for 50%-90% of diet requirements for people in the Pacific; taro, vegetables and other basic agriculture products are the main source of food and provide an important source of income for the population. Most of the arable land in the PSIDS is located in the coastal zones. The increases in the salinity of previously fertile soil in the region have already rendered some land unsuitable for farming, compounding the problem.

## 5.2. Water security

Rainfall is the primary source of freshwater for most islands. However, the adverse impacts of climate change are undermining the dependability of this source. First, shifts in rainfall patterns are expected to increase the frequency and intensity of droughts. The La Niña event of 1998 to 2000 caused water shortages in many PSIDS and resulted in partial shutdowns of the tourism and industrial economic sectors.[22] In Fiji, for example, borehole yields decreased by 40% and had a serious impact on sugar cane production.[23] A single prolonged drought will have disastrous consequences and can lead to the rapid depletion of an island's surface and groundwater resources.

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[18] IPCC AR4, supra at 700.
[19] IPCC AR4, ibid at, 698.
[20] IPCC AR4, ibid.
[21] FAO, Climate Change and Food Security in Pacific Island Countries, 19 (2008).
[22] IPCC AR4, ibid at 697.
[23] IPCC AR4, ibid.

Second, rising sea levels are causing saltwater intrusion into the groundwater supply. This is an especially serious problem for atoll islands, which are permeable and prone to flooding from within. In Tuvalu, salt water intrusion has affected communal crop gardens on six of Tuvalu's eight islands, and has destroyed 60% of traditional pulaka pit gardens.[24] Additionally, higher air temperatures are leading to higher rates of water evaporation, reducing soil moisture and decreasing the rate of groundwater recharge.

Reliable access to freshwater is a necessary prerequisite for ensuring the survival of the islands. For PSIDS, securing adequate freshwater supplies for drinking, sanitation, and agriculture is a constant challenge and climate change is only making it more difficult. Increasing water scarcity due to climate change is a current and ongoing security threat. People are migrating in search of new water supplies. As they move within and across borders, tensions will increase, with increasing competition for natural resources.

### 5.3. Public Health

Climate change, and its attendant increase in natural disasters, has a number of severe ramifications for global public health, including malnutrition, poor sanitation, and increased incidence of water-borne, vector-borne and airborne disease. The ill, the elderly and young children are at greatest risk for contracting these diseases. A decline in the state of a country's public health has negative consequences for its economy, thereby increasing social unrest and spurring political upheaval. In the PSIDS region, declining public health has serious security implications. The increased incidence and severity of diseases could exceed the capacity of a state to respond,[25] thus leading to a severe health crisis and endangering the national security. Moreover, if a country is unable to cope with such a crisis, it will have negative impacts on neighboring states, possibly threatening international peace and security.

- Introduction of new diseases to the region: The emergence of new diseases is expected with temperature increases, flooding, water scarcity and more frequent and severe extreme storms. Expansion of mosquito distribution, increased incidences of skin infections, gastroenteritis and fish poisoning are emerging problems in communities.[26] In the Pacific, the incidence of diarrheal diseases is positively correlated with temperature and negatively correlated with water quality. At the same time, water scarcity can trigger outbreaks of malaria, such as in Vanuatu, where it is already endemic in certain areas and evidence suggests that these areas are extending southwards.[27] In addition, PSIDS are seeing a rise of illnesses once under control.

- Climate change impacts on the sanitation of the region: The increased frequency in natural disasters such as floods and cyclones threatens existing infrastructure for sanitation, and

[24] Tuvalu NAPA, 2007, 27, (Available at: http://unfccc.int/resource/docs/napa/tuv01.pdf)
[25] IPCC AR4, ibid at 701.
[26] Republic of Vanuatu NAPA, December 2007, 23, (Available at http://unfccc.int/resource/docs/napa/vut01.pdf).
[27] Republic of Vanuatu NAPA, ibid at 17-18.

further exacerbates the spread of diseases. The lack of sanitation during times of natural disaster will likely hasten the spread of communicable diseases and vector-borne diseases.[28]

- Climate change endangers food security in the region: It is important to note the strong link between dietary intake and the health and well-being of the people in the Pacific. Without access to affordable and healthy food, obesity-related diseases will continue to rise and affect the health and well-being of the communities. The lack of nutritious food also weakens the immunity of communities, making people more susceptible to disease in the first place.

### 5.4. Physical and social infrastructure

The Pacific region already possesses weak infrastructure and limited medical facilities. Moreover, in the Pacific, more than 50% of the population lives within 1.5 km of the shore, increasing their vulnerability to infrastructure damage.[29] For example, about 70% of Samoa's population and infrastructure are located in the coastal area.[30] Natural disasters destroy buildings, houses, farm land, schools, hospitals and other basic facilities that communities rely on[31] and weaken the social infrastructure. In Suva, Fiji, and Apia, Samoa, port facilities would be overtopped, wharves damaged, and surrounding land flooded with a 50cm increase in sea level combined with waves associated with a 1-in-50 year storm.[32]

Without the infrastructure to build and maintain livelihoods and daily communal activities, social development can be severely disrupted, as can critical health care services and economic progress, further limiting the PSIDS' ability to respond to future natural disasters.

Already, climate-related disasters have had huge impacts on economic growth and national development. Three tropical cyclones – Uma, Anne and Bola – hit Vanuatu in 1987 and 1988, resulting in a significant economic, social and human cost. While social and family networks remain strong in the PSIDS, the physical infrastructure has traditionally been weak and is unlikely to withstand the sheer force of natural disasters.

### 5.5. The loss of lives and livelihoods

The physical health and safety of the Pacific will be severely compromised; the death toll and number of people injured will increase as floods and cyclones strike areas with dense population and weak housing and infrastructure. Populations that suffer natural disasters are faced with the daunting task of re-building the physical and social infrastructure of their communities. Those who survive will also have to contend with the loss of livelihoods, agricultural products, business and personal assets.[33]

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[28] Ibid.
[29] IPCC AR4, ibid at 689.
30 SPREP, *Pacific Adaptation to Climate Change – Samoa – Report of In-Country Consultations* (June 29, 2009), 14, (Available at: http://www.sprep.org/climate_change/PACC/reports_detail_country.asp?id=663)
[31] IPCC AR4, ibid at 702.
[32] IPCC AR4, ibid.
[33] IPCC AR4, ibid at 689, 698, 701.

## 5.6. Migration

The International Federation of the Red Cross in the World Disasters Report 2001 estimated that more people are now forced to leave their homes because of environmental disasters than war. This displacement of peoples is one of the most serious security threats caused by the adverse impacts of climate change. The tensions intrinsic in migration of peoples can easily become open conflict as peoples compete over scarce resources or cause a shift in the existing order.

### *5.6.1. Internal Migration, relocation and displacement*

The adverse impacts of climate change increase the rate of domestic migration and relocation, with people from rural areas and outlying islands moving to urban centers. The number is growing as people in rural areas are losing their livelihoods and land due to natural disasters and sea-level rise. The PSIDS will need to stretch the existing social network to cater for the needs of displaced persons. Internal migration both within and between islands places an enormous strain on food, housing, education, health, and water, as recipient communities struggle to accommodate the number of people migrating. The rapidness and intensity of migration patterns has already caused competition for scarce resources. It has already lead to social unrest in the region, particularly in the Solomon Islands, as described below.

Internal relocations have already occurred. For example, the settlement of Lateau, in the northern province of Torba in Vanuatu had to be relocated because of rising sea levels. Further relocations have happened in the Federated States of Micronesia, Papua New Guinea, Tuvalu and the Solomon Islands.

### *5.6.2. External Migration*

In some PSIDS, internal migration is not feasible due to geographical constraints. While Pacific Islanders are reluctant to leave their ancestral land, relocation to a neighboring or third country might be the only option. Leaving ancestral homelands, and in some cases the entire country, behind is unacceptable in the Pacific culture. External migration has a similar potential for conflict and unrest as internal migration, but adds a cultural and international dimension. No international framework exists for climate-related migration.

## 5.7. Loss of islands

Because the Pacific Islands contain a high number of low-lying atoll islands rising no more than two to three meters above sea level, they are at high risk of total submergence with sea-level rise. Kiribati, the Republic of the Marshall Islands and Tuvalu consist exclusively of atolls.

The adverse impacts of climate change alter the physical landscape of the Pacific region. As sea level continues to rise, it will reach a point where it will eliminate whole islands and even nations. No amount of adaptation to climate change can be sufficient to prevent the loss of islands. The

United Nations has defined several categories of countries facing heightened challenges, such as Least Developed Countries (LDCs), Landlocked Developing Countries (LLDCs) and Small Island Developing States (SIDS). However, no definition of countries facing the loss of islands exists within the UN framework.

Some islands are projected to be submerged entirely under water if the sea-level continues to rise. The loss of islands will not only result in the loss of physical territory but could also have an impact on Exclusive Economic Zones (EEZs) and could lead to border disputes between neighboring countries. Some islands are already partially submerged and have lost land along low-lying coastal areas. For low-lying atolls, the likely impacts can be catastrophic, even requiring population evacuation to other islands or adding numbers to the Pacific Diaspora, with the subsequent social and cultural disruption having unknown proportions. In Papua New Guinea, for example, the population of the Carteret Islands is currently being relocated and the islands could be fully submerged as early as 2015. Once the islands are lost to sea-level rise, the people will never be able to return to their homelands.

### 5.8. Territorial integrity, sovereignty, legal rights

Scientists project major changes to the global landmass during this century. Receding coastlines and submergence of large areas will result in the loss of territory, including the loss of entire low-lying islands and territories, and even some small island states. Internal relocation has already taken place in the PSIDS and the existence of entire nations is threatened. International disputes over land, maritime borders, EEZs and other territorial rights are likely. Long-established rules of international law may prove insufficient in the face of these challenges.

The UN General Assembly, in Resolution 63/213 of 10 February 2009, entitled "Follow up to and implementation of the Mauritius Strategy of Implementation of the Programme of Action for the Sustainable Development of Small Island States," reaffirmed that "the effects of climate change may threaten the very existence of some of them."

On 15 May 2009, the UN High Commissioner for Refugees, in a submission to the 6th Session of the Ad-Hoc Working Group on Long Term Cooperative Action under the UNFCCC, entitled "Climate Change and Statelessness: An Overview," stated that, with regard to low-lying States "such as the Maldives, Tuvalu, Kiribati, and the Marshall Islands, not only is there an issue in relation to population displacement, but the existence of their State as such may be threatened" and that "entire populations of affected states could thus become stateless." According to the UNHCR, in the case of permanent submergence, "the loss of all territory has been cited most frequently as a possible ground for the loss of statehood," but that "a threat to statehood may nonetheless arise much earlier. It is projected that the number and severity of extreme events such as storms and flooding will increase considerably. [...] The IPCC has thus indicated that 'rapid sea-level rise that inundates islands and coastal settlements is likely to limit adaptation possibilities, with potential options being limited to migration.' It has also confirmed that rising sea-levels are unavoidable." Based on a cumulative analysis, the UNHCR concludes that "low-lying island States are thus **very likely** to be entirely uninhabitable long before their full submersion" (emphasis added).

Within the Pacific region, the relationship between climate change and international peace and security is clear and unambiguous. In its most traditional aspects it is threatening the sovereignty, territorial integrity and even the existence of some PSIDS. In addition, the threat of a failure of the state, where it is no longer in a position to provide the basic services to its population is without argument a threat to international peace and security and should be addressed directly by the Member States and the relevant organs of the United Nations.

### 5.9. Conflict and Unrest

The adverse impacts of climate change alter the distribution and quality of natural resources such as fresh water, arable land, coastal territory, and marine resources. These changes can increase competition for scarce resources, with the increased possibility of armed conflict. The link between the environment and armed conflict is well established and has been accepted by the Security Council through its work in the thematic areas of natural resources and conflict, as well as the UK-led open debate on "Energy, security and climate" in April 2007. In addition, population pressures based on internal and/or external migration will heighten the potential for conflict. Existing tensions within PSIDS will similarly be heightened especially in already unstable areas and can endanger national security as well as be a threat to international peace and security.

Shifting boundaries of existing land are particularly problematic for communities with collectively owned lands. The blurring of boundaries can intensify the disputes between communities over land ownership and usage, as communities may fight to re-claim their share of natural resources. This could lead to conflicts between individuals and communities as they try to re-distribute resources, and is likely to evolve into a security threat if not dealt with in a transparent and equitable manner. In such a scenario, the nation's ability to provide law and order could be overstretched and threatened as a whole. The result could be a breakdown in social order that would inevitably have national and regional security implications.

### 5.10. Socio-cultural impacts

The social and cultural impacts of climate change are largely negative in the PSIDS, and in some cases irreversible. As a result of frequent and intensified natural disasters, communities face weakened infrastructure and inadequate access to medical attention in times of need. Communities will experience higher level of political and social unrest as government agencies work to contain the increase in violence that is inevitable due to increased competition for limited resources, namely land, water, food, basic housing, education, shelter and employment opportunities.

Many Pacific Islanders hold the cultural belief that "the people are the land." In some PSIDS, traditional land tenure and other traditional political or social practices relating to the land continue to this day; land is not merely a resource or commodity but an integral part of the social fabric. This is not only a cultural factor but is closely linked to the physical existence of a particular land, in a particular condition, and at a particular location.

## 5.11. Multipliers of conflict

All the factors previously mentioned in the report either already have security implications or are likely to become threats to national security as well as to international peace and security. Climate change is not like other conventional security threats. While the factors outlined above can cause conflict directly, the combination of the threats stemming from climate change impacts of increased water and food insecurities, rising sea levels, and increased extreme weather events such as droughts, floods and cyclones, will create risks to national and regional security as well as to international peace and security. Because climate change has multiple impacts in many different areas, it has the potential to cause multiple problems simultaneously and erode already fragile conditions, both environmental and economic.[34]

The combination of increased disease due to lack of potable water, flooding and coastal erosion, lack of food, and migration will continue to escalate into humanitarian crises that will strain government resources around the globe and especially within the Pacific. In the Solomon Islands, the combination of various adverse impacts of climate change led to armed conflict, requiring the deployment of the Regional Assistance Mission to Solomon Islands (RAMSI).

These elements all lead to increased humanitarian crises. Indeed, based on information that between 1990 and 1999, an estimated 188 million people per year were affected by natural disasters, six times more than the 31 million annually affected by armed conflict,[35] natural disasters have already been identified as a security threat and will only be compounded through multiplier effects.

# 6. Conclusions

Climate change has already shown a wide variety of negative impacts on the PSIDS. Sea levels are rising, coasts are eroding, natural resources are being depleted, waters are increasingly contaminated, and extreme weather events are increasing in severity and frequency. At the same time, resettlements and conflicts have already been triggered by these adverse impacts.

Individually and in combination, these impacts have implications for national security and are on the threshold of endangering regional and international peace and security in the Pacific island region. Limited by their economic and environmental vulnerabilities, the PSIDS are on the frontlines of these impacts, with their survival at stake. But they are only the first countries to be affected. The security challenges they face will increase in the future and be felt around the world. All relevant organs of the United Nations must engage holistically and immediately to address the security implications of climate change.

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[34] The CNA Corporation, National Security and the Threat of Climate Change, 6, (Available at: http://securityandclimate.cna.org/report/National%20Security%20and%20the%20Threat%20of%20Climate%20Change.pdf).

[35] Busby, Joshua & Purvis, Nigel: The Security Implications of Climate Change for the UN System, 2, (Available at: http://www.brookings.edu/views/papers/fellows/purvis20040501.pdf).

## 7. Recommendations

While the PSIDS are already faced with the security implications of climate change, the international community has been slow to respond or has responded in an ad hoc manner. The international community should, in our view, take a more systematic and holistic approach when dealing with climate change.

The United Nations, in adopting GA Resolution A/RES/63/281 has thus far only acknowledged the *possible* security implications of climate change. Given the arguments above, the security threats posed by climate changes are, in our view, no longer a *possibility* but a reality, both in present terms and in their future implications - this fact must be formally recognized by the United Nations if decisive progress is to be made in adapting and mitigating the adverse impacts of climate change.

Furthermore, given the growing nature of the threat posed by climate change, the linkage between climate change and security must be a permanent focus of deliberations in the United Nations. In this regard, it is recommended that this question be regularly addressed via an annual agenda item in the United Nations.

The PSIDS also recommend that a focal point within the United Nations be established to keep track of the growing security implications of climate change.

Urgent consideration should be given to immediate actions which can reduce security implications of climate change, including long-term security issues.

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