CLIMATE AND HEALTH COUNTRY PROFILE – 2015
FIJI

World Health Organization

United Nations Framework Convention on Climate Change

OVERVIEW

The island nation of the Republic of Fiji in the South Pacific Ocean is an upper-middle income country rich in natural resources. The oceanic tropical marine climate means the weather is warm all year round with minimal extremes, and variable rainfall which is slightly higher in the warmest months. Most of the land is on volcanic islands, and the country experiences earthquakes, landslides, cyclones, flooding and storm surges [Fiji INDC, 2015].

Though Fiji contributes minimally to global greenhouse gas emissions, this Small Island State is very vulnerable to climate change: Fiji is already experiencing rising sea levels, coastal erosion, water shortages, salination of water supply, depleted fishery stocks, large-scale flooding and an increase in vector-borne diseases [Fiji INDC, 2015] – all of which will likely increase as the effects of climate change become more pronounced. Furthermore, internal displacement has already been seen in Fiji due to climate change.[a]

The Ministry of Health has been working to increase its capacity to monitor, assess and respond to hydro-meteorological disasters and climate sensitive diseases, thus reducing health risks associated with climate change.[b] By the year 2030, Fiji commits to reducing emissions by up to 30% against a business as usual level, and increasing electricity generation through renewable energy from 60% [2013] to 100% [Fiji INDC, 2015].

SUMMARY OF KEY FINDINGS

- In Fiji, under a high emissions scenario, mean annual temperature is projected to rise by about 3.2°C on average from 1990 to 2100. If global emissions decrease rapidly, the temperature rise is limited to about 0.9°C [page 2].
- In Fiji, under a high emissions scenario, the number of days of warm spell[c] is projected to increase from about 25 days in 1990 to about 350 days on average in 2100. If global emissions decrease rapidly, the days of warm spell are limited to about 160 on average [page 2].
- In Fiji, under a high emissions scenario, and without large investments in adaptation, an annual average of about 4,200 people are projected to be affected by flooding due to sea level rise between 2070 and 2100 [page 3].
- In Fiji, the risk of dengue fever is expected to increase under both high and low emissions scenarios [page 3].

OPPORTUNITIES FOR ACTION

Fiji has an approved national health adaptation strategy and is currently implementing projects on health adaptation to climate change. Fiji is also taking action to build institutional and technical capacities to work on climate change and health and is working to increase climate resilience of health infrastructure. Country reported data [see section 6] indicate that there are further opportunities for action in the following areas:

1) Adaptation

- Fiji is currently undertaking an Integrated Vulnerability and Adaptation Assessment [commenced late 2015]. Finalize this assessment and further advance work in this area.
- Continue work on the development of an Early Warning System, which includes climate variables, for dengue, typhoid and leptospirosis and validate the completed diarrhea model.
- Continue work on the Fiji Ministry of Health/WHO project on adult mosquito trapping which aims at producing a warning system for climate induced mosquito density risks.
- Strengthen financing mechanisms by including the estimated costs to implement the Climate Change and Health Strategic Action Plan [2016-2020] in planned allocations.

2) Mitigation

- Include the health implication of climate change mitigation policies in the national strategy for climate change mitigation [currently in draft].

DEMOGRAPHIC ESTIMATES	
Population [2013][d]	880.5 thousand
Population growth rate [2013][d]	0.7 %
Population living in urban areas [2013][e]	53.0 %
Population under five [2013][d]	10.2 %
Population 65 years or older [2013][d]	5.4 %
ECONOMIC AND DEVELOPMENT INDICATORS	
GDP per capita [current US$, 2013][f]	4,766 USD
Total expenditure on health as % of GDP [2013][g]	4.1 %
Percentage share of income for lowest 20% of population [2010][f]	NA
HDI [2013, +/- 0.01 change from 2005 is indicated with arrow][h]	0.724 ▲
HEALTH ESTIMATES	
Life expectancy at birth [2013][i]	70 years
Under-5 mortality per 1000 live births [2013][j]	23

a UNOCHA 2014. Fiji: Building resilience in the face of climate change http://www.unocha.org/top-stories/all-stories/fiji-building-resilience-face-climate-change
b WHO. Climate Change Adaptation to Protect Human Health: Fiji project profile. http://www.who.int/globalchange/projects/adaptation/en/index4.html
c A 'warm spell' day is a day when maximum temperature, together with that of at least the 6 consecutive previous days, exceeds the 90th percentile threshold for that time of the year.
d World Population Prospects: The 2015 Revision, UNDESA [2015]
e World Urbanization Prospects: The 2014 Revision, UNDESA [2014]
f World Development Indicators, World Bank [2015]
g Global Health Expenditure Database, WHO [2014]
h United Nations Development Programme, Human Development Reports [2014]
i Global Health Observatory, WHO [2014]
j Levels & Trends in Child Mortality Report 2015, UN Inter-agency Group for Child Mortality Estimation [2015]

1 CURRENT AND FUTURE CLIMATE HAZARDS

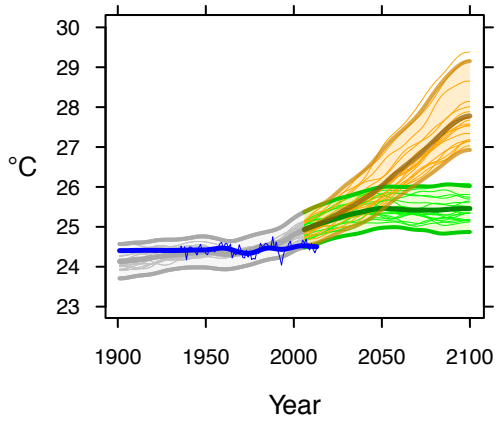
Due to climate change, many climate hazards and extreme weather events, such as heat waves, heavy rainfall and droughts, could become more frequent and more intense in many parts of the world.

Outlined here are country-specific projections up to the year 2100 for climate hazards under a 'business as usual' high emissions scenario compared to projections under a 'two-degree' scenario with rapidly decreasing global emissions. Most hazards caused by climate change will persist for many centuries.

COUNTRY-SPECIFIC CLIMATE HAZARD PROJECTIONS

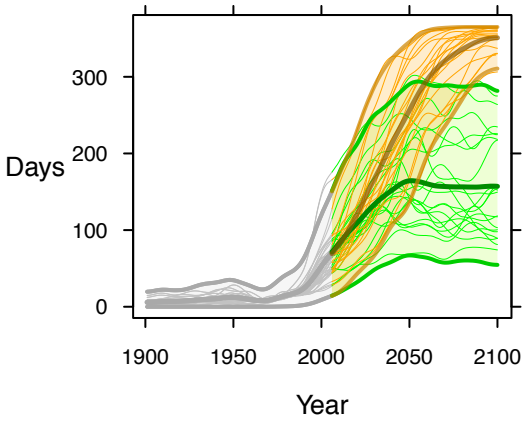
The model projections below present climate hazards under a high emissions scenario, Representative Concentration Pathway 8.5 [RCP8.5] (in orange) and a low emissions scenario, [RCP2.6] (in green).[a] The text boxes describe the projected changes averaged across about 20 models (thick line). The figures also show each model individually as well as the 90% model range (shaded) as a measure of uncertainty and, where available, the annual and smoothed observed record (in blue).[b,c]

MEAN ANNUAL TEMPERATURE



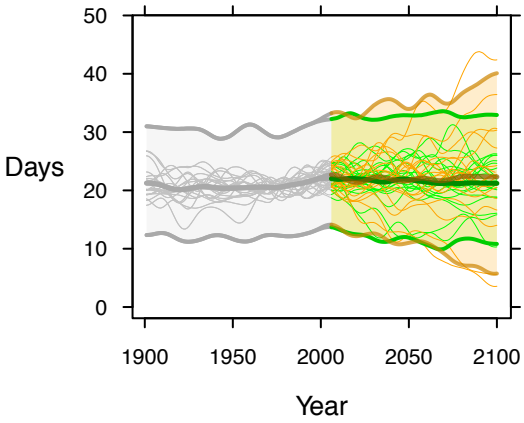
Under a high emissions scenario, mean annual temperature is projected to rise by about 3.2°C on average from 1990 to 2100. If emissions decrease rapidly, the temperature rise is limited to about 0.9°C.

DAYS OF WARM SPELL ('HEAT WAVES')



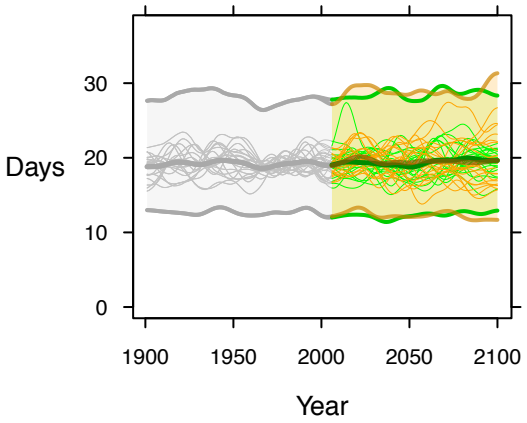
Under a high emissions scenario, the number of days of warm spell[d] is projected to increase from about 25 days in 1990 to about 350 days on average in 2100. If emissions decrease rapidly, the days of warm spell are limited to about 160 on average.

DAYS WITH EXTREME RAINFALL ('FLOOD RISK')



Under both high and low emissions scenarios, the number of days with very heavy precipitation (20 mm or more) is not, on average, expected to change from an average of just over 20 days. Year-to-year variability remains high, and under a high emissions scenario, some models indicate a slight decrease, others a slight increase in risk.

CONSECUTIVE DRY DAYS ('DROUGHT')



Under both high and low emissions scenarios, the longest dry spell is not indicated to change much from an average of about 20 days, with continuing large year-to-year variability.

a Model projections are from CMIP5 for RCP8.5 (high emissions) and RCP2.6 (low emissions). Model anomalies are added to the historical mean and smoothed.
b Observed historical record of mean temperature is from CRU-TSv.3.22.
c Analysis by the Climatic Research Unit and Tyndall Centre for Climate Change Research, University of East Anglia, 2015.
d A 'warm spell' day is a day when maximum temperature, together with that of at least the 6 consecutive previous days, exceeds the 90th percentile threshold for that time of the year.

2 CURRENT AND FUTURE HEALTH RISKS DUE TO CLIMATE CHANGE

Human health is profoundly affected by weather and climate. Climate change threatens to exacerbate today's health problems – deaths from extreme weather events, cardiovascular and respiratory diseases, infectious diseases and malnutrition – whilst undermining water and food supplies, infrastructure, health systems and social protection systems.

ANNUAL EXPOSURE TO FLOODING DUE TO SEA LEVEL RISE, FIJI (2070–2100)

Severity of climate change scenario →

	Without Adaptation	With Adaptation
RCP2.6	1,900	< 100
RCP8.5	4,200	< 100

* Medium ice melting scenario ** Values rounded to nearest '00

Under a high emissions scenario, and without large investments in adaptation, an annual average of about 4,200 people are projected to be affected by flooding due to sea level rise between 2070 and 2100. If global emissions decrease rapidly and there is a major scale up in protection (i.e. continued construction/raising of dikes) the annual affected population could be limited to about < 100 people. Adaptation alone will not offer sufficient protection, as sea level rise is a long-term process, with high emissions scenarios bringing increasing impacts well beyond the end of the century.

Source: Human dynamics of climate change, technical report, Met Office, HM Government, UK, 2014.

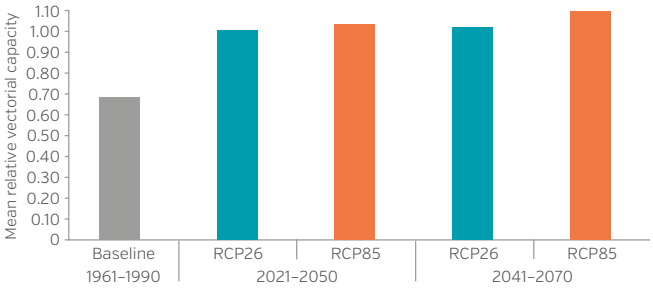
KEY IMPLICATIONS FOR HEALTH

Fiji also faces inland river flood risk. It is projected, that by 2030, an additional 2,000 people may be at risk of river floods annually as a result of climate change and 1,600 due to socio-economic change above the estimated 4,700 annually affected population in 2010.[a]

In addition to deaths from drowning, flooding causes extensive indirect health effects, including impacts on food production, water provision, ecosystem disruption, infectious disease outbreak and vector distribution. Longer term effects of flooding may include post-traumatic stress and population displacement.

INFECTIOUS AND VECTOR-BORNE DISEASES

Mean relative vectorial capacity for dengue fever transmission in Fiji



The mean relative vectorial capacity for dengue fever transmission is projected to increase towards 2070 under both a high and low emissions scenario.

Source: Rocklöv, J., Quam, M. et al., 2015.[d]

KEY IMPLICATIONS FOR HEALTH

Some of the worlds most virulent infections are also highly sensitive to climate: temperature , precipitation and humidity have a strong influence on the life-cycles of the vectors and the infectious agents they carry and influence the transmission of water-borne and food-borne diseases.[b]

Socioeconomic development and health interventions are driving down burdens of several infectious diseases, and these projections assume that this will continue. However, climate conditions are projected to become significantly more favourable for transmission, slowing progress in reducing burdens, and increasing the populations at risk if control measures are not maintained or strengthened.[c]

a World Resources Institute, http://www.wri.org. Aqueduct Global Flood Analyzer. Assumes continued current socio-economic trends (SSP2) and a 25-year flood protection.
b Atlas of Health and Climate, World Health Organization and World Meteorological Organization, 2012.
c Quantitative risk assessment of the effects of climate change on selected causes of death, 2030s and 2050s. Geneva: World Health Organization, 2014.
d Country-level analysis, completed in 2015, was based on health models outlined in the Quantitative risk assessment of the effects of climate change on selected causes of death, 2030s and 2050s. Geneva: World Health Organization, 2014. The mean of impact estimates for three global climate models are presented. Models assume continued socioeconomic trends (SSP2 or comparable).

FOOD SECURITY AND NUTRITION

Climate change, through higher temperatures, land and water scarcity, flooding, drought and displacement, negatively impacts agricultural production and causes breakdown in food systems. These disproportionally affect those most vulnerable people at risk to hunger and can lead to food insecurity. Vulnerable groups risk further deterioration into food and nutrition crises if exposed to extreme climate events.[a] Without considerable efforts made to improve climate resilience, it has been estimated that the global risk of hunger and malnutrition could increase by up to 20 percent by 2050.[a]

Traditionally food security in the South Pacific has been supported through a number of food production strategies including gardening, fishing, hunting, and selling products or labour for cash. Climate change however may increase threats to food security, through its impacts on agricultural production, health, infrastructure, the ability of countries to import food, and the ability of households to purchase food. Commercial agriculture, fisheries and tourism are also likely to be badly affected as will the ability of the region's governments to cope with increasing climate-related disasters.[b]

In 2003, for example, Cyclone Ami, caused devastating losses in agricultural production in Fiji (over US 35 million)[b] and flooding of the Wainibuka and Rewa rivers in April 2004 damaged between 50%-70% of crops.[b] Extreme weather events, like these, are expected to increase in intensity and frequency with climate change.

Additionally, sea level rise will affect the health and livelihoods of communities through loss of land, soil erosion and saltwater intrusion and increasing temperatures could exasperate drought conditions, all further undermining food production, health and infrastructure.

FIJI CASE STUDY: BUILDING HEALTH RESILIENCE TO CLIMATE CHANGE

Fiji is one of seven countries involved in a four-year global project to enhance the capacity of the health sector to respond effectively to climate sensitive diseases (CSDs). The project, Piloting Climate Change Adaptations to Protect Human Health (PCCAPHH), commenced in 2010 and is a partnership between the Fiji Ministry of Health, WHO, the Fiji Red Cross Society (FRCS) and UNDP, with funding from the GEF. Good practices identified through the project include: (1) the establishment of a “climate health” program in the Ministry as the focal capacity to implement the National Climate Change and Health Strategic Action Plan (NCCHAP), (2) the direct involvement of the health sector in the preparation of the Fiji National Climate Change Policy and the National Communications with UNFCCC to mainstream health adaptation, and (3) the collaboration with the Fiji Red Cross Society for community-based health adaptation.

Lessons learned include (1) the long-term need to build the local capacity to conduct vulnerability assessments and adaptation planning, (2) the lack of timely, accurate and reliable surveillance data, (3) the uncertainties about the effectiveness of the community adaptation activities in preventing climate-sensitive diseases and (4) the importance of health sector leadership in the mainstreaming of national climate change actions.

HEALTH IN ALL ADAPTATION ACTIVITIES

Human health is a key component of adaptation activities across all sectors, including, water, energy, agriculture, rural development, housing, environment and community empowerment. A healthy population is a resilient population and, for these reasons, all development sectors in Fiji can improve human health outcomes through their adaptation activities. Some priority sectoral and intersectoral adaptation measures are as follows:[c]

- Ensure clean drinking water, improved sanitation and household disinfection, especially in areas where the incidence of water-borne diseases is higher.
- Improve social indicators such as education, women’s empowerment, housing and equitable access to development opportunities.
- Improve economic indicators such as employment rate, alternative livelihoods and access to markets.
- Enhance community resilience against climate change and disasters.
- Encourage agricultural diversification and sustainable agriculture. Discourage farming in marginal areas.
- The natural environment is a source of food, shelter, medicine, clean water and air. It also acts as a buffer against extreme climate events like floods and cyclones. Moreover, an unpolluted environment is safe for human habitation whereas an altered environment may create conditions for disease microbes and vectors to spread. For these reasons, ecosystems must be protected from unsustainable use.
- Local mitigation measures such as increased use of public transportation, walking/cycling instead of using fossil-fuel powered transport, use of efficient wood stoves that emit less smoke create co-benefits for health while reducing GHG emissions.
- Explore and plan for the development of “green health facilities” with inclusion of renewable energy, sustainable waste management and other innovative “green” initiatives.

a World Food Project 2015 https://www.wfp.org/content/two-minutes-climate-change-and-hunger
b Barnet, J., 2007. Food security and climate change in the South Pacific. Pacific Ecologist, Winter.
c Human health and climate change in Pacific Island Countries. draft report.

3 CURRENT EXPOSURES AND HEALTH RISKS DUE TO AIR POLLUTION

Many of the drivers of climate change, such as inefficient and polluting forms of energy and transport systems, also contribute to air pollution. Air pollution is now one of the largest global health risks, causing approximately seven million deaths every year. There is an important opportunity to promote policies that both protect the climate at a global level, and also have large and immediate health benefits at a local level.

HOUSEHOLD AIR POLLUTION

FIJI

Percentage of population primarily using solid fuels for cooking (%), 2013

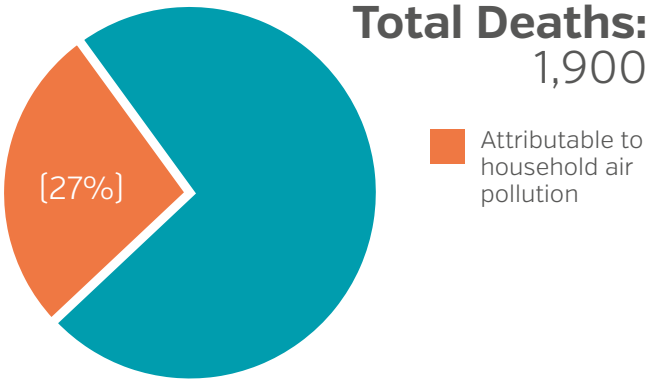
RURAL AREAS **68**

URBAN AREAS **15**

NATIONAL TOTAL **40**

Source: Global Health Observatory, data repository, World Health Organization, 2013.

Percent of total deaths from ischaemic heart disease, stroke, lung cancer, chronic obstructive pulmonary disease (18 years +) and acute lower respiratory infections (under 5 years) attributable to household air pollution, 2012.



Source: Global Health Observatory, data repository, World Health Organization, 2012.

KEY IMPLICATIONS FOR HEALTH

Air pollution in and around the home is largely a result of the burning of solid fuels (biomass or coal) for cooking.

Women and children are at a greater risk for disease from household air pollution. Consequently, household air pollution is responsible for a larger proportion of the of total number of deaths from ischaemic heart disease, stroke, lung cancer and COPD in women compared to men.[a]

In Fiji, about 42% percent of an estimated 50 child deaths due to acute lower respiratory infections is attributable to household air pollution (WHO, 2012).

a Annu. Rev. Public. Health. 2014.35:185-206. http://www.who.int/phe/health_topics/outdoorair/databases/HAP_BoD_results_March2014.pdf?ua=1

4 CO-BENEFITS TO HEALTH FROM CLIMATE CHANGE MITIGATION: A GLOBAL PERSPECTIVE

Health co-benefits are local, national and international measures with the potential to simultaneously yield large, immediate public health benefits and reduce the upward trajectory of greenhouse gas emissions. Lower carbon strategies can also be cost-effective investments for individuals and societies.

Presented here are examples, from a global perspective, of opportunities for health co-benefits that could be realised by action in important greenhouse gas emitting sectors.[a]

Transport

Transport injuries lead to 1.2 million deaths every year, and land use and transport planning contribute to the 2–3 million deaths from physical inactivity. The transport sector is also responsible for some 14% (7.0 $GtCO_2e$) of global carbon emissions. The IPCC has noted significant opportunities to reduce energy demand in the sector, potentially resulting in a 15%–40% reduction in CO_2 emissions, and bringing substantial opportunities for health: A modal shift towards walking and cycling could see reductions in illnesses related to physical inactivity and reduced outdoor air pollution and noise exposure; increased use of public transport is likely to result in reduced GHG emissions; compact urban planning fosters walkable residential neighborhoods, improves accessibility to jobs, schools and services and can encourage physical activity and improve health equity by making urban services more accessible to the elderly and poor.

Electricity Generation

Reliable electricity generation is essential for economic growth, with 1.4 billion people living without access to electricity. However, current patterns of electricity generation in many parts of the world, particularly the reliance on coal combustion in highly polluting power plants contributes heavily to poor local air quality, causing cancer, cardiovascular and respiratory disease. Outdoor air pollution is responsible for 3.7 million premature deaths annually, 88% of these deaths occur in low and middle income countries. The health benefits of transitioning from fuels such as coal to lower carbon sources, including ultimately to renewable energy, are clear: Reduced rates of cardiovascular and respiratory disease such as stroke, lung cancer, coronary artery disease, and COPD; cost-savings for health systems; improved economic productivity from a healthier and more productive workforce.

Household Heating, Cooking and Lighting

Household air pollution causes over 4.3 million premature deaths annually, predominantly due to stroke, ischaemic heart disease, chronic respiratory disease, and childhood pneumonia. A range of interventions can both improve public health and reduce household emissions: a transition from the inefficient use of solid fuels like wood and charcoal, towards cleaner energy sources like liquefied petroleum gas (LPG), biogas, and electricity could save lives by reducing indoor levels of

Healthcare Systems

Health care activities are an important source of greenhouse gas emissions. In the US and in EU countries, for example, health care activities account for between 3–8% of greenhouse gas (CO_2-eq) emissions. Major sources include procurement and inefficient energy consumption. Modern, on-site, low-carbon energy solutions (e.g. solar, wind, or hybrid solutions) and the development of combined heat and power generation capacity in larger facilities offer significant potential to lower the