

Fiji

Profile of Health and Environment



Fiji – Health and Environment Profile

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Acknowledgements

This report was prepared by Dr. Carlos Corvalan and Dr. Rokho Kim, with inputs from Dr Meciusea Tuicakau, Permanent Secretary for Health & Medical Services; Dr. Eric Rafai, Deputy Secretary Public Health, Mr Dip Chand, National Adviser Environmental Health; Mr Manasa Rayasidamu, Mr Elia Lawena and Mr Aminiasi Tavui, Senior Environmental Health Officers; Mr. Suliasi Batikawai, WaSH Project Officer and Ms. Kelera Oli, Climate Change and Health Officer.

The authors are grateful for the insights provided by the EHOs of the Ra Rural Health Office, Ba Rural Health Office, Lautoka Rural Health Office and Nadi Airport Health Office and Suva Rural Health Office. An inter-institutional workshop provided further inputs to understanding roles and responsibilities of the different actors and the authors acknowledge the following institutions: Fiji Bureau of Statistics; Fiji Meteorological Services; Fiji National University (Mrs. Railala Tavui); Land Transport Authority of Fiji; Ministry of Agriculture; Ministry of Education; Ministry of Local Government, Urban Development, Housing & Environment; Pacific Community (SPC); The United Nations Children's Fund; Water Authority of Fiji; and World Health Organisation. The authors are indebted for the support of Ms. Kelera Oli, Ms. Maraia Meo, Ms. Shin Young Oh, Ms. Suyeon Yang, Mr. Yungbin Kim and Ms. Yerim Lee.

Foreword

It gives me great pleasure to provide a foreword comment on this environment and health profile document jointly prepared by the Environmental Health Unit of the Ministry of Health and Medical Services together in collaboration with the World Health Organization.

Apparently, this document is an inaugural initiative, involving a handful of key stakeholders representing government organizations and institution contributing as primary data source to information widely shared in this profile.

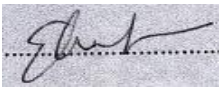
I understand that this environment and health profile contains brief highlights of the significant inputs by different players working outside the domain of the Ministry of Health and Medical Services, to protect our natural environment and resources that support a safe environment conducive to the health of all Fijians.

Another exceptional object in this document is the recognition of what defines health that makes it an ambitious goal to accomplish, if it remains as a central core function of health care delivery alone and not considered to be addressed as a social responsibility.

The authors however, have attempted to demonstrate this clearly depicting the connections of achieving the SDG's and vision of the Healthy Islands, is only attainable as a collective effort of many key stakeholders.

I fully support the timely development of this initiative, believing it will bring about critical environmental health changes that would see the born of a modern EH plan to mitigate, minimize and control environmental risks and hazards through effective surveillance, enforcement (health protection) health promotion and efficient partnership networks.

Finally, I would like to thank the World Health Organization and the Environmental Health Unit for their valuable contributions to the production of this Environment and Health profile document.



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Deputy Secretary Public Health

Acronyms

ABR: Adolescent Birth Rate

CBD: Convention for Biological Diversity

COP: Conference of the Parties

DALY: Disability Adjusted Life Year

DoE: Department of Environment

EBD: Environmental Burden of Disease

EH: Environmental Health

EHO: Environmental Health Officers

FBS: Fiji Bureau of Statistics

FJD: Fiji Dollar

FNU: Fiji National University

GHG: Greenhouse Gases

GNI: Gross National Income

H&E: Health and Environment

HDI: Human Development Index

IHME: Institute of Health Metrics and Evaluation

MA: Millennium Ecosystem Assessment

MMR: Maternal Mortality Rate

MoHMS: Ministry of Health and Medical Services

NCD: Non-communicable Diseases

NGO: Non-governmental Organization

SDGs: Sustainable Development Goals

SIDS: Small Island Development States

UNCCD: United Nations Convention to Combat Desertification

UNDP: United Nations Development Programme

UNFCCC: United Nations Framework Convention on Climate Change

UNICEF: United Nations Children's Fund

WB: World Bank

WHO: World Health Organization

YLL: Years of Life Lost

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1. Introduction

Understanding the relationship between Health and Environment (H&E) comes naturally to the people in Pacific Island countries. Nowhere is the fragility of the environment, and the direct exposure of people to this fragility, better appreciated than in small island nations. Small islands are small ecosystems where people and environment support each other, and where real sustainability has been, and must continue to be, the norm.

This was understood and made explicit by the Ministry of Health & Medical Services (MoHMS) in the call for action in the 2002 National Environmental Health Action Plan (NEHAP). The NEHAP is a set of strategies for Fiji's Environmental Health (EH) professionals to execute our national commitment to the 'Healthy Islands' initiative (MoHMS, 2002).

Global environmental changes, which include destruction of ecosystems related to economic growth, and global climate change, among others, pose an enormous threat to the livelihood and wellbeing of small island nations. These changes aggravate current environmental health risks associated with water, sanitation, and vectors; increase waste generation, indoor and outdoor air pollution, unsafe food and toxic chemicals; and intensify climatic impacts from floods, storms and drought in the islands.

This Profile of H&E for Fiji attempts to address the current and future threats related to the environment and its sustainability and proposes a series of recommendations to better address these threats.

1.1 The Yanuca Island Declaration – two decades of inspiration

The Ministers of Health and representatives of 19 Pacific island governments met at Yanuca Island, Fiji, for the Eleventh Pacific Health Ministers Meeting and reaffirmed their commitment to the Healthy Islands vision (WHO, 2015). This is expressed as:

Healthy Islands are places where

- *children are nurtured in body and mind;*
- *environments invite learning and leisure;*
- *people work and age with dignity;*
- *ecological balance is a source of pride; and*
- *the ocean which sustains us is protected.*

To operationalize the Healthy Islands vision into specific actions, the Ministerial meeting proposed recommendations, under four thematic areas:

- 1) Strengthening leadership, governance and accountability;
- 2) Nurturing children in body and mind;
- 3) Reducing avoidable disease burden and premature deaths; and
- 4) Promoting ecological balance.

The Profile of H&E of Fiji takes this vision as the starting point both to develop the profiles and to propose its recommendations. Taking an H&E approach, it places people at the core, analyzing all the environmental determinants that affect them.

1.2 Sustainable Development Goals

On September 2015, a United Nations General assembly made a resolution, titled "Transforming our world: the 2030 Agenda for Sustainable Development" that described a new plan of action, that proposes 17 Sustainable Development Goals (SDGs) and 169 targets. Goal 3 specifically relates to health, *to ensure healthy lives and promote well-being for all at all ages* (UN, 2015).

The 3rd Goal is directly or indirectly linked to, and most often positively affected by, actions proposed in the other 16 Goals that include: No poverty; Zero hunger; Quality education; Gender equality; Clean water and sanitation; Affordable and clean energy; Decent work and economic growth; Industry, innovation and infrastructure; Reduced inequalities; Sustainable cities and communities; Responsible construction and production; Climate action; Life below water; Life on land; Peace, justice and strong institutions; and, Partnerships for the goals (see Annex 1 for the full list of SDGs). Goal 3 and the related goals are considered integral to the development of this profile.

1.3 A framework integrating Healthy Islands and SDGs

In November, 2015 the MoHMS in collaboration with the World Health Organization (WHO) conducted an interagency consultation in Suva that lay the foundation for this report. The workshop participants' perspective was constructed into Table 1 that shows the inter-linkages between the 17 SDGs and the 4 action areas of the Yanuca Declaration, from the context of H&E. The table provides qualitatively estimated weights to identify the strength and importance of associations between Yanuca action areas and SDGs, and thereby ascertain the priority actions.

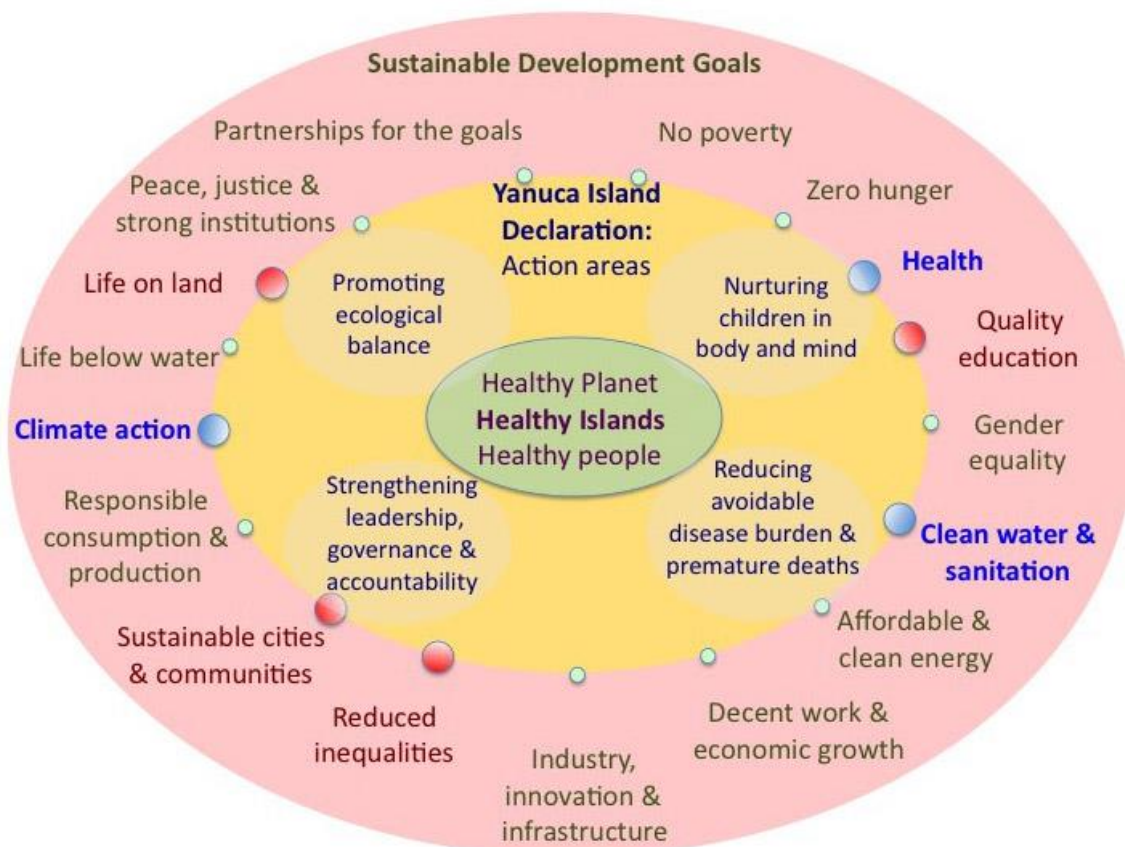
Table 1. Inter-linkages between the Yanuca Declaration action areas, and the SDGs from the point of view of Health and Environment

Sustainable Development Goals	Health and Environment action areas			
	Leadership	Children	Disease	Ecology
No poverty	+	+	++/	+/
Zero hunger	+	++/	++	+/
Health	+++	+++	+++	+++
Quality education	++	++	+++	++
Gender equality	+/	+/	+/	++
Clean water and sanitation	++/	+++	+++	+++
Affordable and clean energy	+	+	+	++/
Decent work and economic growth	+	+	++	++/
Industry, innovation & infrastructure	++	+/	++	++/
Reduced inequalities	+++	++	++	++
Sustainable cities and communities	++	+/	+/	+++
Responsible consumption & production	+/	++	++	++/
Climate action	+++	++/	+++	+++
Life below water	+	+/	++	++/
Life on land	++	++	++/	++/
Peace, justice and strong institutions	+/	+/	+/	++
Partnerships for the goals	++	+/	++	++

Note: The table represents the average of groups during the workshop. The symbols represent: + relevant ++ very relevant +++ highly relevant. Because group averages provided fractions, the symbol "/" denotes half. Because of the importance of actions on Promoting Ecological Balance for the area of health and environment, for this analysis, double points were given to this column (not shown).

The highest prioritized SDGs for H&E are: Health, Clean water and sanitation, and Climate action. The important SDGs for H&E in Fiji are: Quality education, Reduced inequalities, Sustainable cities and communities, and Life on land. The 4 areas for action of the Yanuca Declaration and the prioritized SDGs for EH formed the basis for a framework (figure 1).

Figure 1. Framework for Environmental Health priorities for Fiji, based on the Healthy islands and SDGs



2. Strengthening leadership, governance and accountability

2.1 Development patterns

The Republic of Fiji is an island nation with an estimated 330 islands (one third inhabited) and with an estimated population of 837,271 people (2007 Census). Of these, approximately 56.8% were iTaukei, 37.5% Indo-Fijian, and 5.7% other ethnic groups. Population estimates for 2016 foresee a population of 873,210, of which 61.6% are iTaukei, 31.3% Indo-Fijian, and 7.1% of other ethnic groups. The 2007 census reported 50.7 % of the population living in urban areas, and an overall under 15 population of 29.4% of males and 28.6% females (FBS, 2014). Fiji has a land mass of 18333 km². Two large islands, Viti Levu (10429 km²) and Vanua Levu (5556 km²) constitute 87% of the total land mass (Government of Fiji, 2012).

Life expectancy at birth increased from 66 in 1990 to 70 in 2014. Neonatal mortality (per 1000 live births) was reduced from 17 in 1990 to 10 in 2015. In the same period, Infant mortality rate went down from 25 to 19. Under 5 mortality rates for the same period reduced from 30 to 22 (24 in males and 20 in females). Adult mortality rate (defined as the probability of dying between the ages of 15 and 60) was 237 for male and 141 for females (based on data from 2008-2013). (WB, 2015a)

Fiji's Human Development Index (HDI) in 2014 was 0.727, which is considered *High Human Development*, and was ranked 90 out of 188 countries and territories assessed. Gross national income (GNI) per capita was estimated at USD 7493 in 2011. The mean years of schooling, were 9.9 years (UNDP, 2015a). Fiji's HDI has increased from 0.631 in 1990, to 0.678 in 2000, to 0.717 in 2010. (UNDP, 2015b).

According to estimates from the Fiji Bureau of Statistics (FBS), the percentage of the population living in poverty (2008-2009) was 31% of the population for the whole of Fiji, with 19% urban and 43% rural. Poverty by Divisions shows that the lowest percentage of the poor is among urban population in the Central Division at 16%, and the highest in the rural areas of the Northern Division at 51%. The percentage of households in poverty was 26% for Fiji, 15% urban and 37% rural (FBS, 2015). Income is unequally distributed. Based on 2008 data, wealth distribution is as follows:

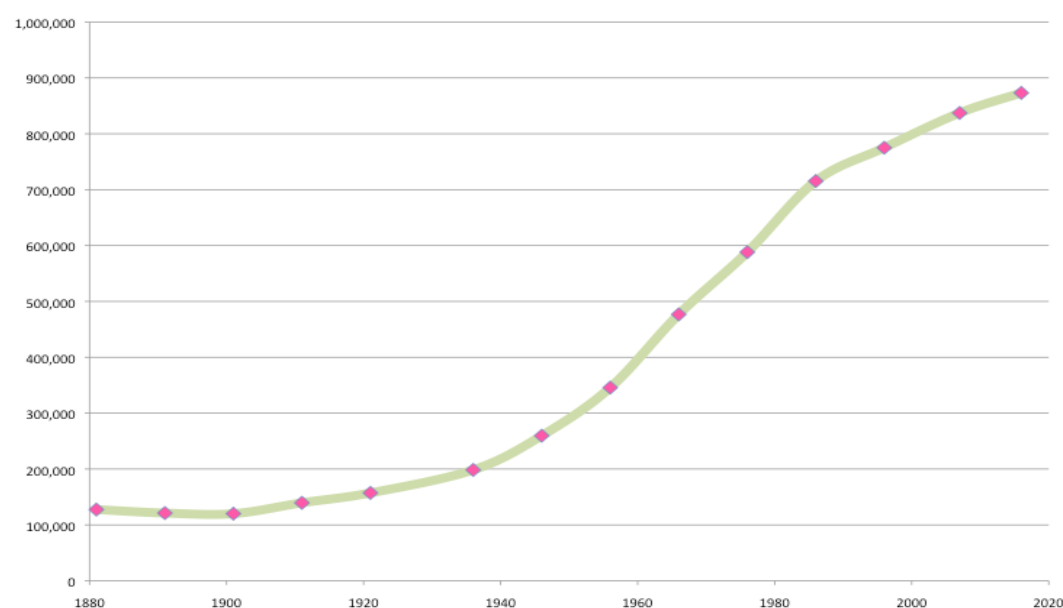
Lowest 10%	Lowest 20%	Second 20%	Third 20%	Fourth 20%	Highest 20%	Highest 10%	Gini Index
2.5	6.1	10.1	13.9	20.2	49.7	34.7	42.8

(WB, 2015b)

Services account for 59.7% of the economic activity. Other key sectors are Agriculture (16.1%) and Industry (24.2%). An important fraction of revenues come from tourism. In 2012 there were 660590 arrivals (mostly from Australia, New Zealand, USA, and Europe). However, 70% of the workforce is in agriculture. Sugar processing makes about a third of all industrial activities. (Government of Fiji 2014; FBS 2014).

In 2008-2009, there were 88724 households in urban areas and 86523 in rural areas. Persons per household were 4.5 urban and 4.8 rural. Average household incomes were much higher in urban areas at FJD 23036, than in rural areas FJD 11608 (FBS 2015). Figure 2 shows population growth based on census data and projections by the FBS. There were important increases in populations recorded in the census of 1946 and 1956, with sustained growth in 1966 and 1976, with progressive slowdown afterwards.

Figure 2. Fiji population growth 1861 to 2007 (Census) and projections to 2016



Source, FBS, 2015

2.2 Existing services for health and environment

Urban areas, where slightly more than 50% of the population lives, are serviced with water, sanitation, electricity and solid waste collection. Some informal settlements in peri-urban areas and itaukei villages may have access to water and electricity, but have minimal access to solid waste collection. Therefore Environmental Health Officers (EHOs) conduct quarterly clean-up campaigns to remove domestic waste. Similarly rural villages and small islands may have no such services.

Understanding the complexity surrounding the relationship that exist between human and the living environment, requires a combination of approaches to make up the entire operational component of the EH plan to mitigate, minimize and control environmental risks and hazards through effective surveillance, enforcement (health protection) and health promotion initiatives.

Working in collaboration with relevant stakeholders and in partnership with communities is an extremely vital tool to enhance the effectiveness and efficient execution of some activities of EH Department. Integration within and outside the ministry is the way forward to maximize resource utilization, time management and consolidate desired outcomes.

2.3 Role of the environmental health unit

The EH Department's main role is to enforce legislations promulgated for the protection of public health from environmental health risk factors, such as pollution, insanitary conditions, poor quality drinking water supply, illegal developments, improper waste management practices, breeding of disease vectors, poor food quality etc. These key result activity areas are listed below:

1. Environmental Health Planning/Management
2. Pollution Control Program
3. Sanitation & Health program
4. Food & Water Quality Control Program.

5. Vector Control & Disease Investigation Program
6. International Quarantine and Port Health Services
7. Legal /Enforcement Program
8. Licences & Permits
9. Administration & Local Authority Services
10. Other Special works.

The work of EHOs is guided by these key result areas described in the MoHMS's Standard Operating Procedures Manual for Environmental Health Officers.

Air Quality

Monitoring environmental air quality is hindered by the lack of equipment and human resources. There are no air pollution monitoring stations and it is limited to that brought in by international research.

Water Quality

Water is tested for microorganisms, but not for chemicals. EHO staff are few, and not trained to perform any analysis and almost all testing is done in laboratories in Suva (e.g. for water and food).

Quarantine Health

A major task of EHOs is the provision quarantine health services for international boats and aircraft arriving in country. The Public Health Act enables EHOs to enter and inspect ships, to ensure adequate water, sanitation, food storage, and ensure the absence of vectors. Non-compliance with orders results in fines to the owners of these vessels.

2.4 *Institutional structure in MoHMS: Environmental Health Department*

The Environmental Health Department has as its Vision, "an integrated and decentralized environmental management system to foster good health and wellbeing"; and as its Mission "to promote quality Environments and Deliver Healthy people to Fiji". Currently it has 124 EH staff positions, of which 55 are in the Western Division, 47 are in the Central-Eastern Division, 17 in the Northern Division and 5 at the Central Board of Health. EHOs are responsible for environmental health matters and the management of EH services. They have a pivotal role in providing primary care and preventative service, and also undertake actions stipulated in the various Acts and Regulations above.

An important fraction of EHOs work is dedicated to inspections following building applications. For example, in 2015, they received 1812 applications of which 64% were residential and 10% commercial. EHOs responded to 1592 public health complaints, which included problems such as sewerage overflows, burning of rubbish, and discharging wastewater in public drainage nuisance, Food & Food Premises, illegal development, mosquito breeding, and sanitation.

According to the Environmental Health Annual Report 2015, 38689 dwellings were visited and inspected for drinking water supply. Piped water was available for 10156 dwellings while ground water is used by 2713, surface water by 4371 and rain water by 4000 dwellings respectively. During 2015, EHOs cleared 8963 vessels, of which 5718 were aircraft, and 1086 were fishing vessels. These vessels included over 940 thousand travelers.

The Fiji National University (FNU) produces human resources specialized in EH. The College of Medicine, Nursing and Health Sciences offers a certificate in environmental health (1 year course); a diploma in EH (2 year course); and a bachelor of EH (3 year course). Most MoHMS environmental health staff were trained in EH at the FNU. Staff must have at least a diploma to work as EHO, or ideally a bachelor's degree in EH. Some few have done

Masters in other countries, including Australia and New Zealand. (see <http://www.cmnhs.fnu.ac.fj/> for details). Fiji has a professional association of EH, called the Institute of Environmental Health set up by the MoHMS. This operates as a Facebook page (FIEH, 2016). The FIEH is managed by its executive committee made up of EHOs around Fiji, in government, municipalities, other organizations and institutions. The executive committee members are elected during the Annual General meeting (AGM) and according to its constitution can serve up to two terms of two years per term. All EHOs need to be registered and licensed to practice as required under the Allied Health Practitioners Decree.

The MoHMS is guided by two overall Strategic Pillars articulated in the Ministry of Health National Strategic Plan 2016-2020.

The first Strategic Pillar focuses on delivery of health services to the population and is divided into the following key priority areas:

1. Non-communicable Diseases (NCDs), including nutrition, mental health, and injuries
2. Maternal, infant, child and adolescent health
3. Communicable diseases (CDs), environmental health, and health emergencies

The second Strategic Pillar focuses on health systems strengthening and is based on the WHO Health Systems Framework, "systems building blocks":

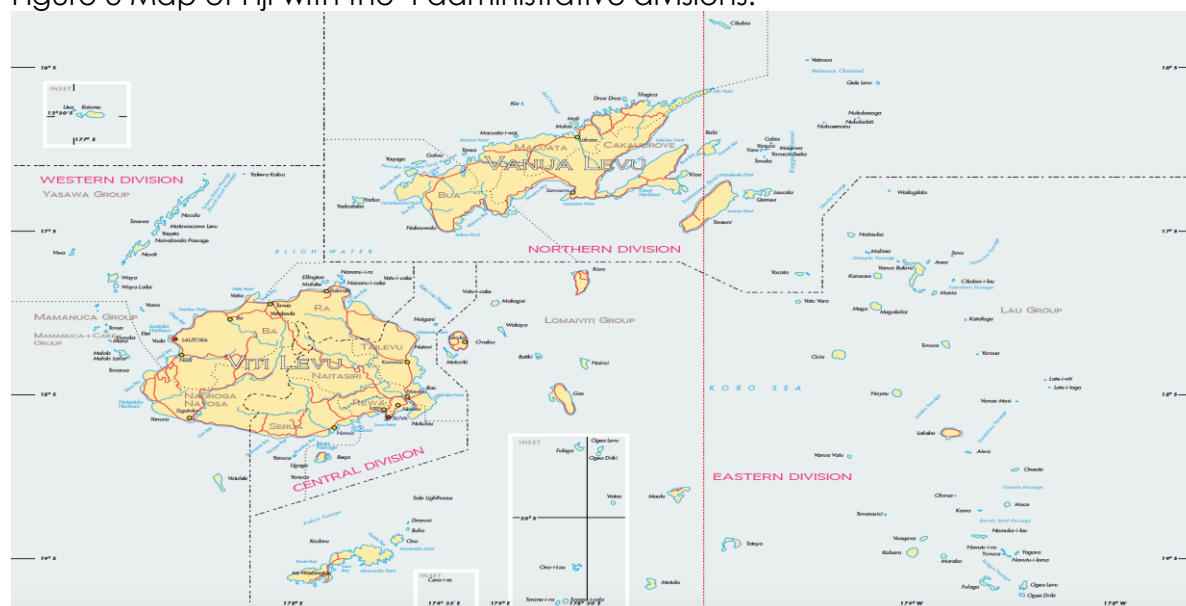
4. Primary health care, continuum of care, quality, and safety
5. Productive, motivated health workforce
6. Evidence-based policy, planning, implementation and assessment
7. Medicinal products, equipment & infrastructure
8. Sustainable financing

Pillar one and priority area three touches upon the responsibilities of EHOs:

From a strategic perspective, this calls for greater integration of planning and management in these areas, especially for climate-change and environment-related health issues both within the MoHMS as well as with other government ministries, especially with the Ministry of Local Government, Housing and Environment, which is responsible for all public health prevention and regulation activities in municipal areas.

EH is a cross cutting area, which contributes directly or indirectly to the work of these eight priority areas. The specific focus given to EH in the Strategic Plan is water and sanitation, pollution control and enforcement.

Figure 3 Map of Fiji with the 4 administrative divisions.



2.5 Legislative and policy framework

The role is enhanced through the combination of health protection, health promotion and surveillance programs articulated under the following legislations and nine key result areas:

Legislations

- Public Health Act, Cap 111
- Food Safety Act 2003
- Food Safety Regulation 2009
- Quarantine Act, Cap 116
- Town Planning Act, Cap 139
- Town Planning General Provisions
- Sub-Division of Land Act, Cap 125
- Burial & Cremation Act, Cap 117
- Tobacco Control Decree 2010
- Tobacco Control regulation 2012
- Litter Decree 2009
- National Building Code,
- The Environmental Management Act
- The Burial and Cremation Act
- Markets Act.
- And the Drinking Water Standards of Fiji.

The main legislation for EH in Fiji is the Public Health Act Cap 111 of 1936 which has undergone an extensive review and awaiting parliamentary endorsement in 2016. The Act empowers public health officers to enter premises to inspect any water supply and sewerage system (Government of Fiji, 1936). They also have the prerogative to close dwellings or buildings unfit for human habitation, although in practice this is rarely implemented.

The Act is quite specific on the control of mosquitoes, requiring buildings to be free of mosquito breeding sites (removing containers and tall grass, perforating gutters when

required) and is an offence when mosquito larvae are found breeding in any receptacle within compounds and premises (Government of Fiji, 1936).

EHOs also conduct prosecution cases but with difficulty due to obsolete Laws. However, every year EHOs manage to successfully prosecute approximately 20-25 cases in the MoHMS and around 200 cases in the Municipal councils.

Tobacco control Unit is the strongest arm of the EH Department which has fixed penalty fines under the tobacco control Act and Regulations.

Every year tobacco control and enforcement Unit prosecute approximately 1000-1500 cases attributed to the decrease in the cardiovascular disease and Air pollution due to smoking and second hand smoke (MoHMS NCD Step Survey).

3. Nurturing children in body and mind

3.1 Focusing on children: priority Health and Environment issues

Children are particularly sensitive to their environment, and negative environmental factors have higher impacts on children than in the general population. WHO estimated in 2016 that close to 22% of the global burden of disease can be attributed to modifiable environmental factors. In children under 5, up to 26% of all deaths could be prevented if environmental risks could be removed (WHO, 2016). In 2013, infant mortality rate was 13.4 (per thousand live births), while under-5 mortality was 17.5 (FBS, 2014), although a recent United Nations report estimates higher under-5 mortality rates (25 in 2000, and 22 in 2015; UN-IGME, 2015). Maternal mortality rate (MMR) is defined as the Number of deaths due to pregnancy-related causes per 100,000 live births. The estimate for Fiji is 59 (2013 data). This is higher than the MMR for countries with High development (at 41); but lower than the average for Small Island Development States (SIDS) (at 220) (UNDP, 2015c).

Adolescent birth rate (ABR) is defined as the Number of births to women ages 15–19 per 1,000 women ages 15–19. In Fiji the average is 42.8 (based on the average of 2010 to 2015 estimates). This is lower than for other SIDS at 61.5, but much higher than the average for countries with Very High human development (19.0), and higher than countries with High human development (28.8), which is Fiji's development category. Fiji is in fact closer to the average for countries with Medium human development level (43.4) (UNDP, 2015c).

Fiji is not free from violence against children. Between 2010 and 2014 there were 2932 reported cases of child sexual abuse, of which one third was classified as rape as recorded in the crime statistics of the Fiji Police Force. There were also 1904 cases of child physical abuse, of which 71.9% were classified as “assault occasioning actual bodily harm” (FBS, 2015).

3.2 Burden of disease in children from environmental risk factors

There are two important environmental risk factors for children: Water, sanitation and hygiene, and household air pollution.

The Institute of Health Metrics and Evaluation (IHME) has estimates for Fiji of the Burden of Disease for unsafe “water, sanitation and hand washing”, and for the combined effects of household and ambient air pollution, and their additional contribution to the disease group “Diarrhoea, respiratory and other common infections”. Unsafe water, sanitation and hand washing is responsible for 4.4% of all deaths in children under 5 year old, and 5.5% in the age group 5-14. The impact of air pollution is lower, yet significant at 1.9% of all deaths in the under 5 age group, and 0.9% in the age group 5 to 14. These are shown in table 2.

Table 2. DALYs and deaths in children from two environmental risk factors in Fiji

Diarrhoea, lower respiratory, and other common infectious diseases					
	Age group	DALYs per 100,00 (95% CI)	Percent of total DALYs	Deaths per 100,000	Percent of total deaths
Unsafe water, sanitation and hand washing	Under 5	2739 (1379-4918)	4.6%	28.9 (12.9-54.8)	4.4%
	5 to 14	302 (187-449)	3.2%	3.4 (2.0-5.3)	5.5%

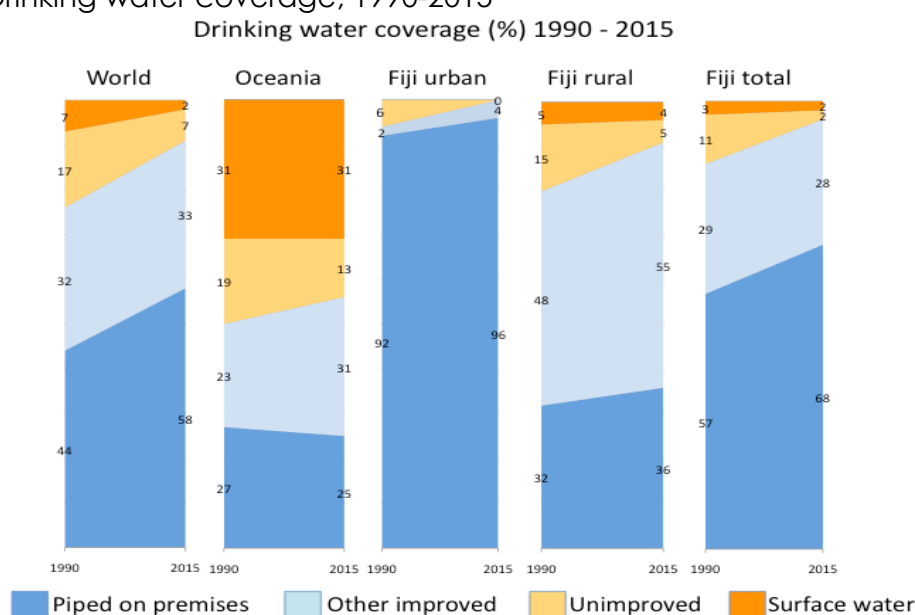
Air pollution	Under 5	1051 (470-2010)	1.8%	12.2 (5.5-23.4)	1.9%
	5 to 14	45 (21-81)	0.5%	0.6 (0.3-1.0)	0.9%

Source: IHME, 2015a.

3.3 Water, sanitation and hygiene

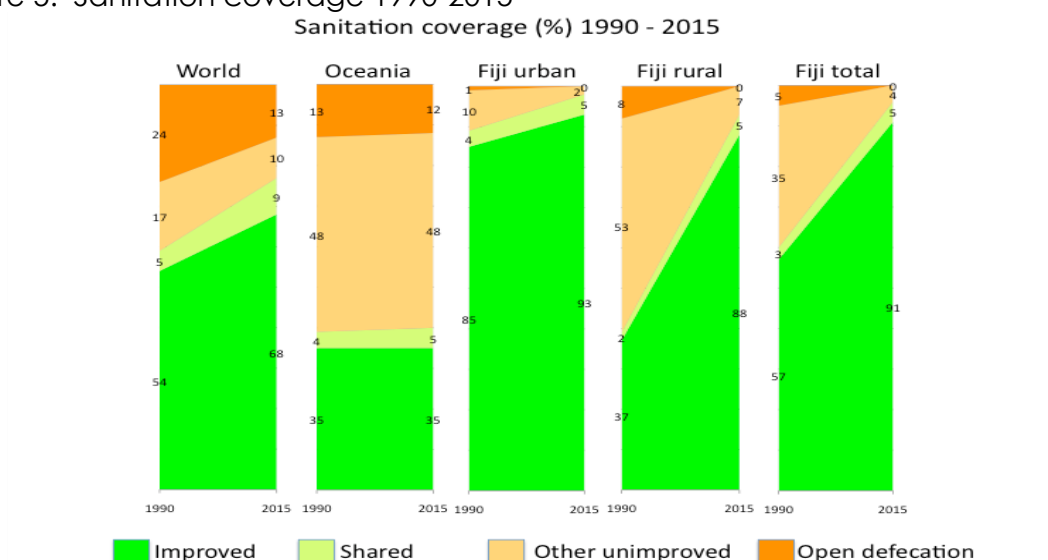
Access to safe drinking water, adequate sanitation facilities and proper hygiene are important factors for good health but they are particularly important for the health of children. Fiji has made important improvements in access to improved water sources and improved sanitation. According to the latest statistics from the Joint Monitoring Program on Water and Sanitation (UNICEF and WHO, 2015), (Progress on sanitation and drinking water – 2015 update and MDG assessment) Fiji met both MDG targets for Water and for Sanitation. The percentage of persons with improved water sources was 94% for urban areas, and 80% for rural areas in 1990. This increased to 100% in urban areas and 91% in rural areas in 2015. Overall the proportion of the 2015 population that gained access since 1990 was 26%. The percentage of persons with improved sanitation was 85% for urban areas, and 37% for rural areas in 1990. This increased to 93% in urban areas and 88% in rural areas in 2015. Overall the proportion of the 2015 population that gained access since 1990 was 45%. Figure 4 shows improvements in access to water and figure 5 of sanitation in Fiji for the years 1990 and 2015.

Figure 4. Drinking water coverage, 1990-2015



Source: JMP UNICEF & WHO, 2015

Figure 5. Sanitation coverage 1990-2015

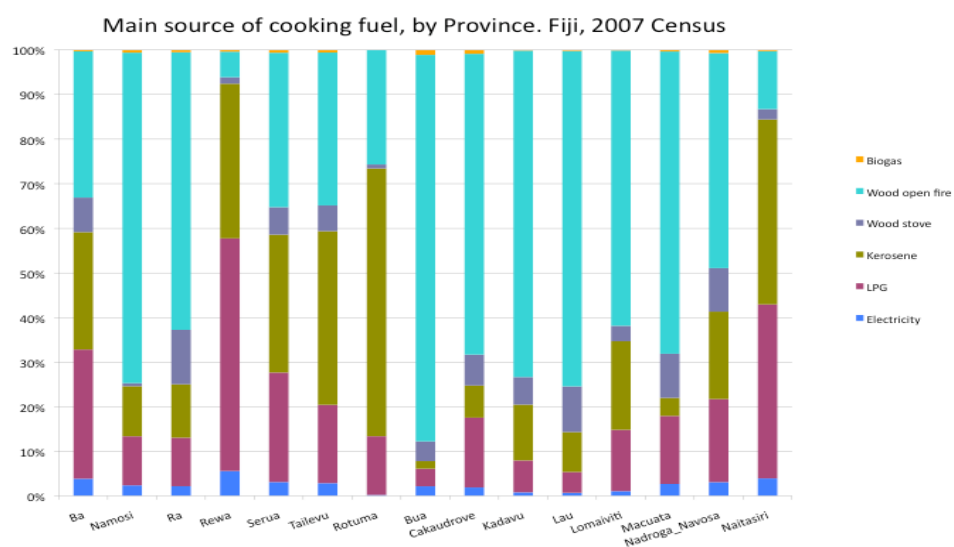


Source: JMP UNICEF & WHO, 2015

3.4 Household air pollution

Air pollution from the burning of solid fuels (biomass) affects the health of women and children in particular, because of their proximity to the source. Detailed exposure information is not available, but data from the 2007 Census shows that a high proportion of households use wood (either in a wood stove or on open fires) for cooking. A study by Bonjour et al (2013a), found that a high fraction of the population in Fiji uses solid fuels. Although this proportion is diminishing, it is still sufficiently high so as to be causing health problems. Percentage of population using solid fuels, and 95% confidence intervals were 55% (42, 69) in 1990; 44% (32, 58) in 2000; and 37% (24, 50) in 2010 (Bonjour et al, 2013b). Figure 6 shows the main sources of cooking fuel by province. Wood open fire continues to be the most used fuel, both for traditional reasons and cost.

Figure 6 Main sources of cooking fuel by province



Source. SPC, 2015 (based on Fiji 2007 Census).

3.5 Education

Data collected by the Ministry of Education show that in 2014 there were 5,460 teachers in 733 primary schools, and 4,637 teachers in 179 secondary schools. Although education has high priority in Fiji, data collected in the Census of 2007 shows that an important number of children are classified as workers. In the age group 10-14, out of 38,916 children in urban areas, 7.0% (2733) were classified as working. In rural areas, out of 43,468 children, 11.7% (5066) were classified as working. The fraction is higher in the age group 15-19, with 18.8% of urban and 28.8% of rural adolescents classified as working. (FBS, 2014)

4. Reducing avoidable disease burden and premature deaths

4.1 Public health statistics

The leading causes of mortality and morbidity, as recorded by MoHMS in 2014, are shown in tables 3 and 4. A WHO study done in 2016 identified “attributable environmental fractions” for key diseases and disease groups. The study identified that approximately 31% of cardiovascular diseases can be attributed to environmental causes. Similarly, 20% of cancers; 40% of road traffic injuries; 35% of lower respiratory infections and 14% of upper respiratory infections; and 57% of diarrhoeal diseases (WHO, 2016). These fractions do not necessarily apply to Fiji. However, it is important here to indicate that several of the diseases listed in the top 10 for mortality and morbidity, have some environmental component in their causality.

Table 3. Leading causes of mortality by disease group, 2014

Rank	Disease group	Number	% of total
1	Diseases of the circulatory system	2417	34.9
2	Endocrine, nutritional and metabolic diseases	1465	21.1
3	Neoplasm	691	10.0
4	External causes of injuries	412	5.9
5	Diseases of the respiratory system	398	5.7
6	Certain infectious and parasitic diseases	397	5.7
7	Diseases of the genitourinary system	166	2.4
8	Diseases of the digestive system	157	2.3
9	Certain conditions originating in the perinatal period	121	1.7
10	Diseases of the nervous system	117	1.7
Total	Top 10 causes	6341	91.5
Grand total	All causes	6927	100

MoHMS, 2014a

According to World Bank (WB) data, communicable diseases and maternal, prenatal, and nutrition conditions accounted for 12% of deaths in 2012. NCD were 80% and Injuries 8% (WB, 2015c).

Table 4. Leading causes of morbidity by disease group, 2014

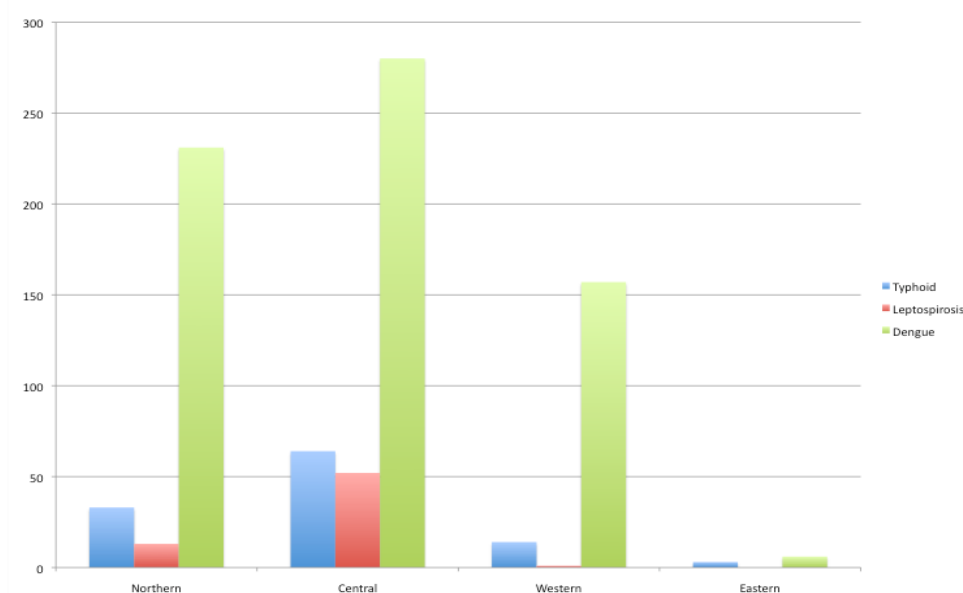
Rank	Disease group	Number	% of total
1	Certain Infectious & Parasitic Diseases	5819	14.1
2	Diseases of the Circulatory System	4064	9.9
3	Diseases of the Respiratory System	3694	9.0
4	Injury, Poisoning & Certain Other Consequences of External Causes	2916	7.1
5	Diseases of the Skin & Subcutaneous Tissue	1791	4.4
6	Endocrine, Nutritional & Metabolic Diseases	1710	4.2

7	Diseases of the Genitourinary System	1503	3.7
8	Diseases of the Digestive System	1190	2.9
9	Certain Conditions Originating in the Perinatal Period	805	2.0
10	Diseases of the Blood & Blood Forming Organs	542	1.3

MoHMS, 2014b

Infectious and parasitic diseases are still the leading cause of morbidity. Figure 7 shows the number of cases found during disease investigations in 2014. There were 983 notifiable disease reports, of which 53 were confirmed.

Figure 7 Prevalence of dengue, typhoid and leptospirosis, 2014.



Source: MoHMS, 2014b.

The IHME has modeled data estimates for all countries. Data for Fiji is available at <http://www.healthdata.org/fiji>. From the IHME database, the leading causes of Years of Life Lost (YLL) to premature deaths in 2013, were as follows (table 5):

Table 5. Ranking of leading causes of YLL to premature deaths and percent change between 1990 and 2013.

Ranking	Cause	% change 1990 - 2013
1	Ischaemic heart disease *	13%
2	Diabetes *	303%
3	Cerebrovascular disease *	-12%
4	Lower respiratory infections *	-46%
5	Congenital anomalies *	67%
6	Neonatal preterm birth *	-38%
7	Chronic kidney disease *	-15%
8	Road injuries	101%

9	Breast cancer	34%
10	COPD *	1%

* Also top 10 in terms of Disability Adjusted Life Years (DALYs)

Source: IHME, 2015b

In 2014 there were 118 recorded cases of suicide and 112 of attempted suicide. Of combined total cases, 64 (23 suicides and 41 attempted suicides) were with Paraquat, and 37 with other chemicals. Paraquat related cases were more prominent among men (41 cases, of which 14 deaths) than in women (23 cases of which 9 deaths), (FBS, 2015).

4.2 Environmental burden of disease

WHO's environmental burden of disease (EBD) study provides country in terms of deaths and DALYs for Infectious, parasitic, neonatal and nutritional conditions, NCD, and injuries. Fiji compares favorably to the rest of the world with 15% of deaths and 17% of DALYs attributed to environmental risks. An important fraction of all deaths are due to NCD (WHO, 2016)

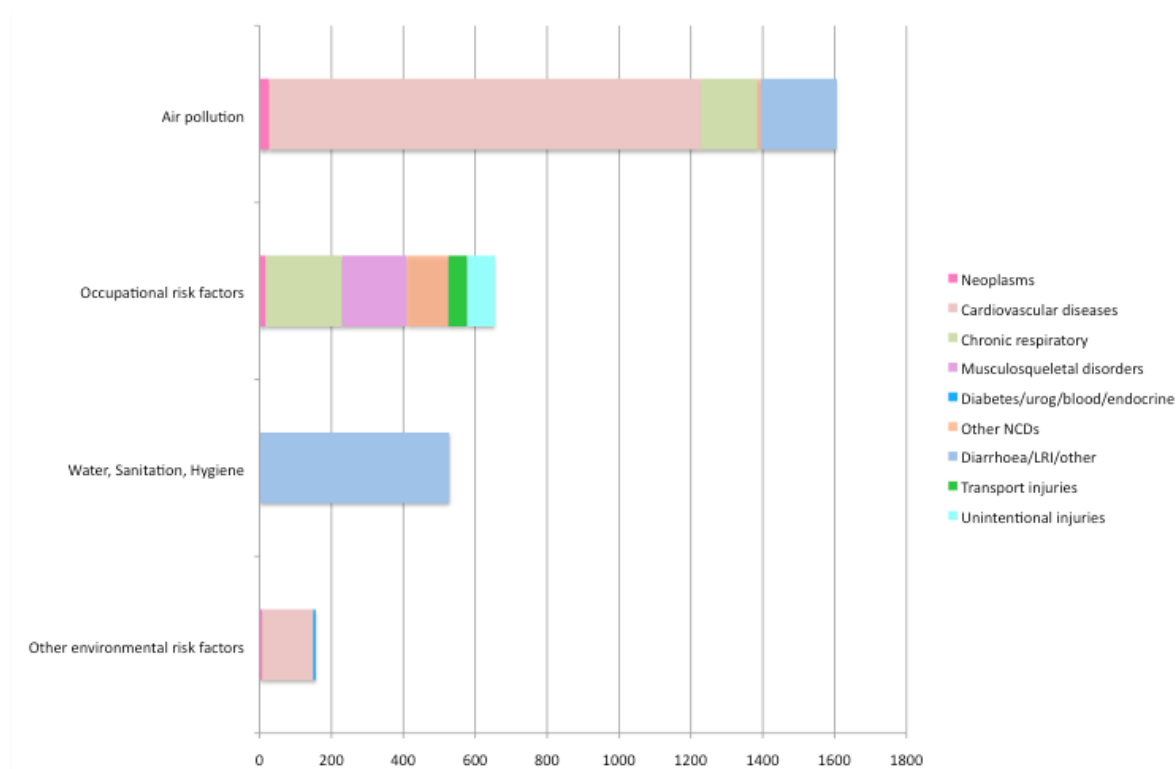
Table 6 Deaths and DALYs attributed to the environment in Fiji.

Total environment attributable deaths					
	Infectious, parasitic, neonatal and nutritional	Noncommunicable	Injuries	Total	% deaths attributable to the environment
FIJI	72	624	222	918	15
WORLD	2,503,679	8,170,727	1,950,088	12,624,495	23

Total environment attributable DALYs					
	Infectious, parasitic, neonatal and nutritional	Noncommunicable	Injuries	Total	% DALYs attributable to the environment
FIJI	10,849	28,804	13,721	53,374	17
WORLD	201,721,743	276,224,287	118,466,141	596,412,171	22

The IHME produced burden of disease for different risk factors, by country, for 2013. Environmental risk factors assessed were placed into four categories: Air pollution; Occupational risk factors; Water sanitation and hand washing; and Other environmental factors. DALYS per 100,000 are shown in figure 8.

Figure 8. DALYs per 100,000 for Air pollution, Occupational factors, Water, sanitation and hygiene, and other environmental factors



Source IHME, 2015a.

5. Promoting ecological balance

5.1 Environmental quality

The vision of the Department of Environment (DoE) under the Ministry Local Government, Urban Development, Housing and Environment is “a safe, healthy and sustainable environment for all”. This vision is very complementary to the concepts of Healthy Islands. DoE has as a dedicated unit for waste management and pollution control, which addresses solid waste, liquid waste, air pollution and hazardous (including chemical) wastes. Their concerns include both protection of ecosystems and of public health (DoE, 2015a). Recognized problems include oil spillage; improper dumping of wastes, chemical mismanagement, vehicle emissions, open burning of rubbish, and contamination of waterways. However, the DoE acknowledges difficulties in addressing all these areas, for lack of financial and human resources (DoE, 2015a).

5.2 Solid waste management

Fiji has the National Solid Waste Management Strategy that recognizes the potential negative impacts of solid wastes for public health, the environment, food security, tourism and trade. It recognizes with concern that most solid wastes is illegally disposed of in the sea, unused land, streets, or burned. The DoE has the National Liquid Waste Management Strategy, which covers domestic, commercial and industrial liquid wastes, marine shipping and urban storm-water. There is also the National Air Pollution Strategy, which aims to protect ecosystems and the population from the harms of air pollution. It includes efforts to reduce air pollution levels targeting the source, and create awareness in the population. (DoE, 2015b). Table 7 lists waste generation by Division in 2011.

Table 7. Waste generation by Division, 2011

Division	Provincial council	Population	Household waste collected	Generation rate (Kg/person/day)
Central	Lami	20223	1240	0.33
	Nausori	24383	3280	0.37
	Nasinu	87446	12965	0.41
	Suva	85691	12653	0.40
Western	Nadi	12000*	3409	0.78
	Lautoka	44226	6305	0.39
	Ba	15000	2045	0.37
	Tavua	1402	156	0.30
	Sigatoka	9261	1183	0.35
	Rakiraki	4952	N/A	N/A
Northern	Savusavu	6000	756	0.34
	Labasa	7706	N/A	N/A
Eastern	Levuka	1131	N/A	N/A

* Population estimated at 20000 but only 12000 are served with waste collection

Medical wastes and quarantine wastes from ports and airports are incinerated.

Source: DoE, 2015c

5.3 Air pollution

There are several sources of air pollution identified by the DoE. Sources of air pollution are identified through complaints and from routine observations by the DoE. The list in Table 8 is in order of severity of the problem based on these observations; however there are currently no monitoring stations to determine the level of specific pollutants. The WB

estimates for 2013 the mean annual exposure to PM_{2.5} at 7 μ g/m³ (this is similar to levels in Finland and Australia) (WB, 2015d)

Table 8 Sources of air pollution

Source of air pollution	Urban	Rural and informal settlements
Vehicle emissions	X	
Open Burning	X	X
Industrial emissions	X	
Agricultural burning	X	X
Incinerators	X	
Cooking in open (wooden) stoves	X	X
Emissions from shipping vessels	X	
Dust from gravel roads	X	X
Diesel generators		X

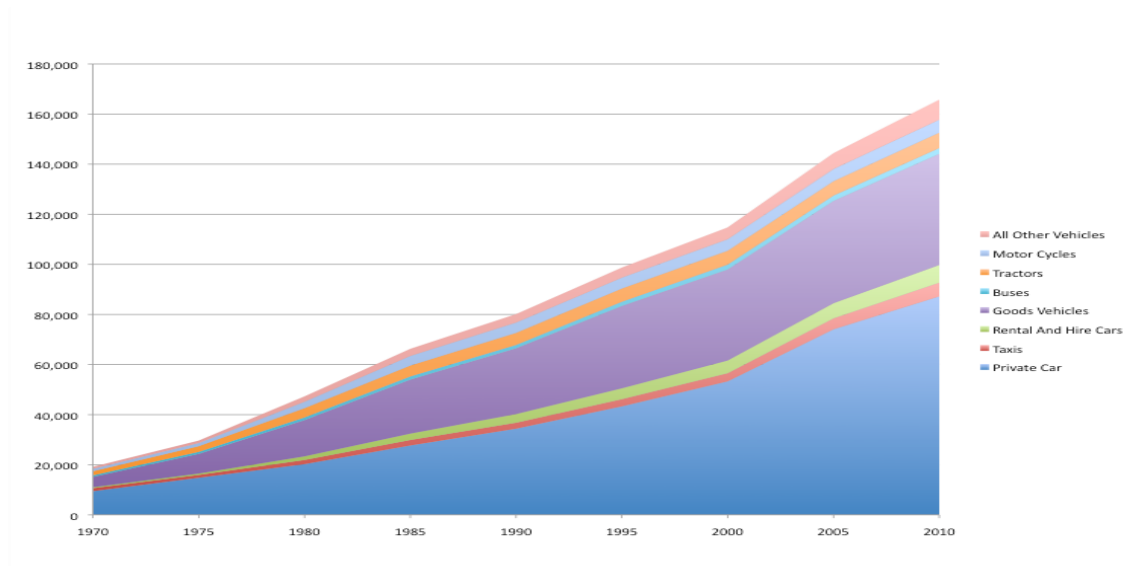
Source: (DoE, 2015d)

Vehicle emissions become evident in large cities (e.g. Suva), where some poorly maintained vehicles are easily spotted. Site visits allowed observation of open burning of rubbish, in communities with no solid waste removal services. These are often small fires, in multiple locations, producing substantial local air contamination. What is burned is not discriminated and may include a range of household residues, including plastics. Field visits also allowed observation of cooking in open stoves. Because of the warm climate, cooking was observed outdoors, however the smoke was sufficient to cover large areas, which would affect also other households.

5.4 Transport

Statistics from the FBS show that in 2013 there were just over 184 thousand registered motor vehicles, of which 97,361 were private cars, 7,341 were taxis, 8,333 rental cars, 47,958 goods transport vehicles, 2,584 buses, 6,157 tractors, 5,165 motor cycles, and 9,125 of other type (FBS, 2014). The growth in motor vehicles has been more accentuated for private cars and for vehicles for the transport of goods (trucks). Figure 9 shows the increase in motor vehicle registration from 1970 to 2010.

Figure 9 Growth in motor vehicle registration from 1970 to 2010.



Source, FBS, 2014

Data from 2011 indicate there were 632 persons involved in motor vehicle collisions. Of these, 54 were fatalities and 206 were hospitalized. The most common collision class was involving pedestrians, with 244 persons involved, resulting in 19 fatalities and 80 hospital admissions. Car collisions killed 14, with 64 hospitalizations, with a total of 181 persons affected (FBS, 2014).

5.5 Electricity

Access to electricity in rural areas increased from 69% in 2003 to 80% in 2013. Fiji National Energy Policy (Draft) adopted a target of 95% electrification by 2020. There is an ambitious target of 0% of the population with primary reliance on wood fuel for cooking by 2030 (Table 9). This target would be very important to reduce exposures and associated health impacts on women and children in particular (ECA/SMEC 2013a).

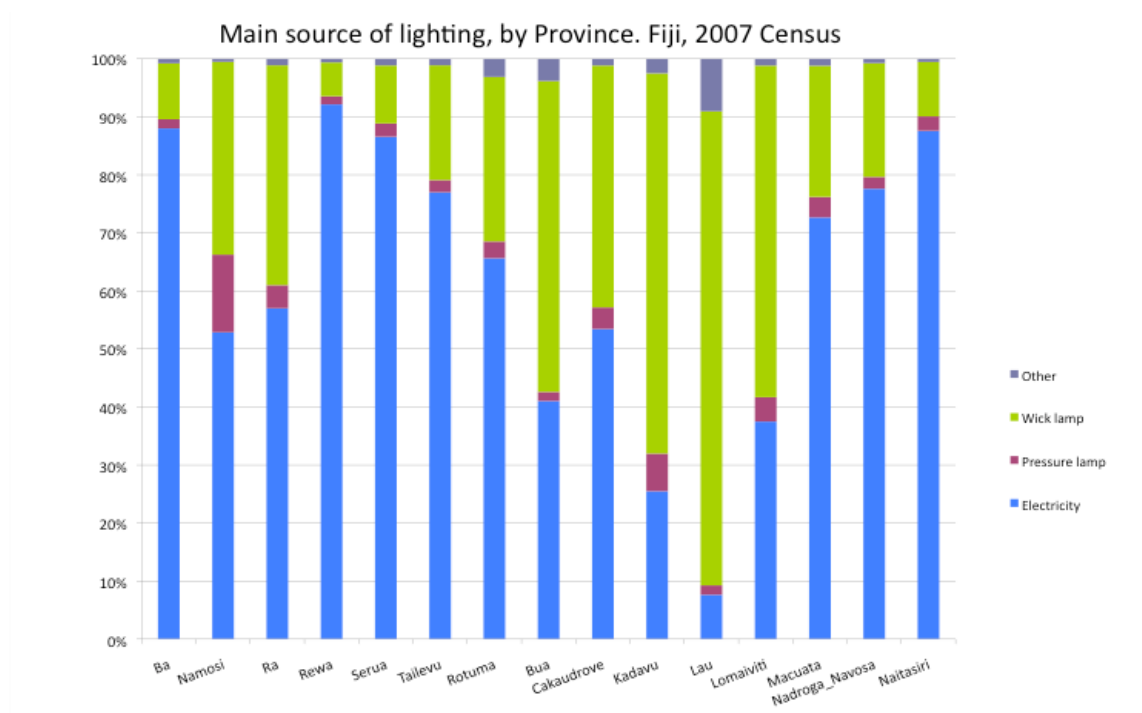
Table 9 Fiji targets for sustainable energy

Indicators	Baseline	2015	2020	2030
Access to modern energy services				
Percentage of population with electricity access	89% (2007)	90%	95%	100%
Percentage of population with primary reliance on wood fuels for cooking	20% (2004)	18%	12%	0%
Improving energy efficiency				
Renewable energy share in electricity generation	56% (2011)	67%	81%	100%
Renewable energy share in total energy consumption	13% (2011)	15%	18%	23%

ECA/SMEC 2013b

Electricity is the main source of lighting in most provinces, with a few exceptions. The second most important source is wick lamp, in particular in the provinces of Lau, Kadavu and Lomaiviti. Figure 10 shows the main source of lighting by province based on 2007 census data.

Figure 10 Source of lighting by province, 2007.

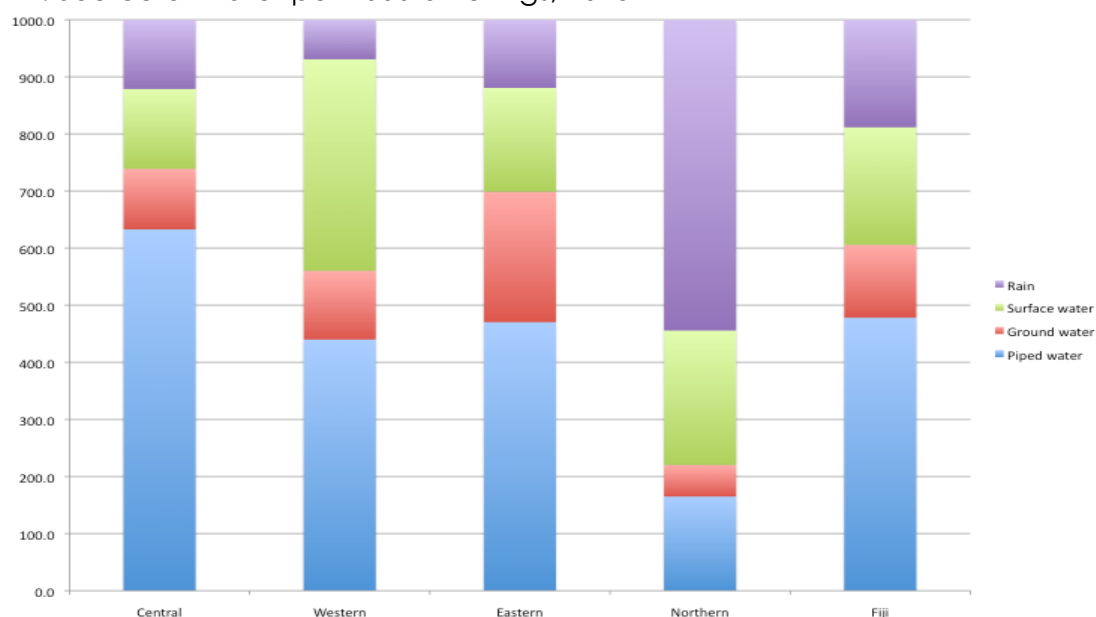


Source: SPC, 2015 (based on Fiji 2007 Census).

5.6 Water and sanitation

Water and sanitation are much improved but they continue to be a problem in Fiji. Statistics from the EH Department, based on inspections of 460 communities with a total of 33755 dwellings in 2014, show important differences in the sources of water. Although piped water was available in about half of the dwellings reviews, rain is particularly important source of water for the Northern region, and surface water for the Western region. Figure 11 shows source of water per 1000 dwellings in 2014, per region and the country as a whole.

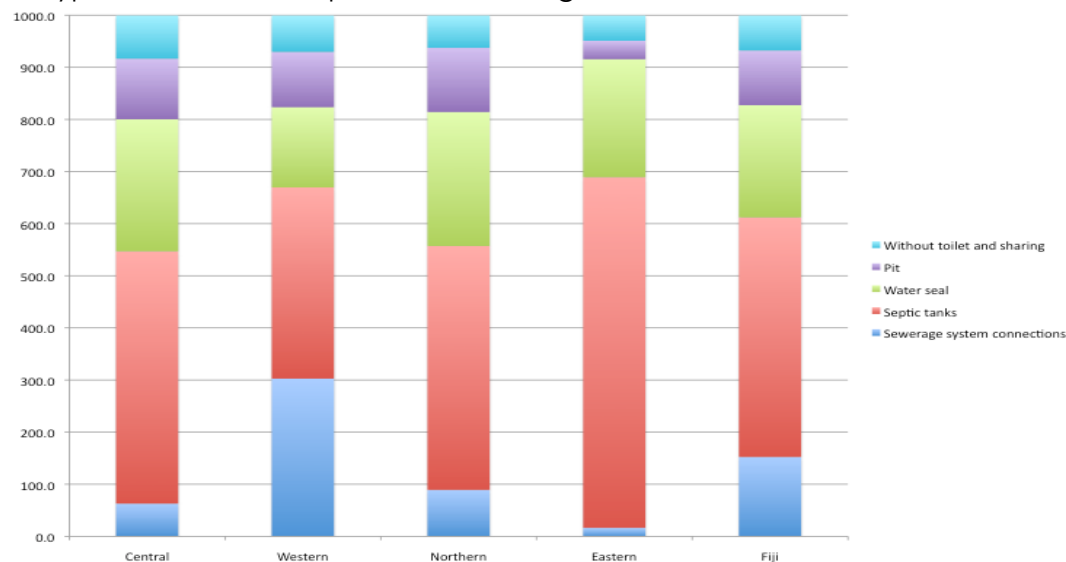
Figure 11. Source of water per 1000 dwellings, 2015



Source: MoHMS, 2014b

Based on the same review of 33755 dwellings, the Environmental Health Department reported on type of wastewater disposal. The most common disposal system are septic tanks. Around 15% of dwellings surveyed were connected to sewerage systems. Figure 12 shows the type of connection per 1000 dwellings.

Figure 12. Type of connection per 1000 dwellings, 2014



Source: MoHMS, 2014b

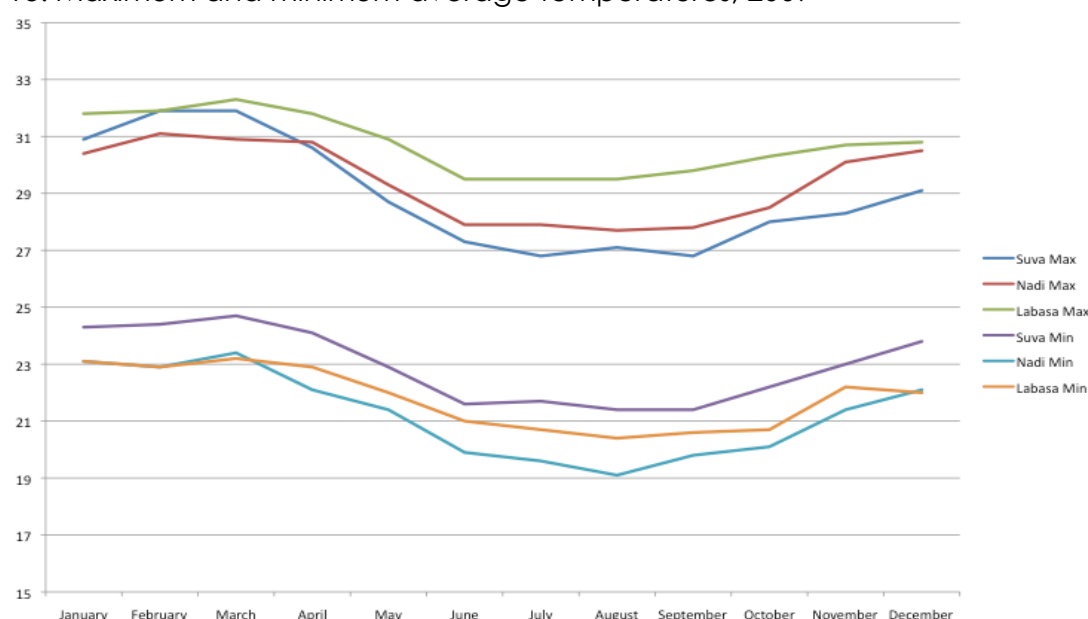
Deaths attributable to inadequate water, sanitation, and hygiene, were estimated by Prüss-Ustün et al. (2014), for the year 2012. Mean number of deaths (95% confidence interval) were 12 (1 - 20) from unsafe water; 3 (0 - 8) from unsafe sanitation; and 17 (0 - 50) hygiene related deaths. Because the combined risk factors are not additive, but rather they overlap, the estimate for the three water related risk factors combined was 25 deaths (7 - 42).

In addition to the problem of water quality there is an increasing problem of water scarcity. This is due to social and economic, as much as environmental reasons. Freshwater withdrawals (%) for 2013 were for agriculture, Fiji 61%, world 71%. For industry, Fiji 11%, world 18%, for domestic use, Fiji 28%, world 12%. (WB, 2015e)

5.7 Climate change and extreme weather events

Fiji has an oceanic tropical climate with rather constant average daily temperatures of around 25°C. It has a dry season from May to October with average daily temperatures between 23° – 25° C. During the rainy season, from November to April, average temperatures are slightly higher with variations from 26 - 27°C during the rainy season. El Niño events bring reduced rainfall and hotter than normal conditions to the islands around December to February, which can turn into drought. Most affected areas are the west side of the main islands. The 1997-98 El Niño brought one of the worst droughts on record. Most common climate related extreme events are cyclones (85% of all events), followed by floods (11%), landslides (2%), and droughts (2%). (Government of Fiji, 2014). An El Niño related drought is currently impacting some of the islands. Maximum and minimum average temperatures for Suva, Nadi and Labasa are shown in figure 13, for the year 2009.

Figure 13. Maximum and minimum average temperatures, 2009



Source: FMS, 2015

The 2nd National Communication has an extensive chapter on human health although equally important is the analysis of the impacts on other sectors which in turn would have an impact on health (Government of Fiji, 2014).

Water sector impacts with potential health consequences: climate impacts related to droughts (increased water shortages; declining water quality of groundwater; and storage tanks); impacts related to rainfall flooding (contaminated water, water borne diseases); impacts related to cyclones and storms (saltwater contamination; damage to water infrastructure).

Agriculture sector impacts with potential health consequences: droughts (risks on food security; increased fire risk; heat stress in farmers); increased temperature (increased harmful bacteria and pathogens); heavy rainfall and flooding (increased risk in animal waste contamination to water sources) cyclones and storms (lack of drinking water; food security).

For the health sector the 2nd National Communication recommends health adaptation measures to include:

- Continuous health vulnerability assessment for communicable and non-communicable diseases and for safety and accessibility of health facilities and healthcare.
- Improve access to primary health care.
- Integrated vector management by building or strengthening partnerships with relevant stakeholders.
- Facilitate rapid and accurate disease notification.
- Identify and protect the health of the most vulnerable members of society (elderly, disabled, women, children, poor).
- On-going education and training on climate change, disaster risk reduction, community health adaptation, etc.
- Incorporate climate change into existing health policies and plans.

For natural disaster the recommendations are:

- Strengthen disaster risk reduction, recovery and response programmes.
- Improve coordination among inter-sectoral partners.
- Develop or strengthen early warning systems.
- Climate-proof health infrastructure.

The latter is of critical importance to the health sector. Specific recommendations include relocating health facilities if they are in vulnerable areas, ensuring facilities have backup or renewable electricity, water, and adequate and sufficient medical supplies available during and after a natural disaster event.

Climate change threats are complex environmentally, socially and politically. This is made explicit by Fiji's statement at the COP-21 (Paris, December 2015): *"The rising sea levels and extreme weather events caused by climate change are already beginning to destroy our islands and our way of life. And if the world doesn't act decisively now to reduce the carbon emissions of the industrialized nations, we are doomed."* Moreover, Fijians are aware of their responsibilities and solidarity towards other Pacific countries, already providing land for Kiribati to ensure food security, and is working out a mechanism to offer permanent relocation to the entire populations of Kiribati and Tuvalu, in a worst-case scenario. Moreover, in spite of its very small carbon footprint, Fiji aims at reducing its 0.004% of the total global emissions, by one third by 2030 (UNFCCC COP21, 2015).

Box 1: Public Health Act and climate change

Morrow and Bowen (2014), made an analysis of all relevant legislation which could account for health in climate change policies. Although climate change and its impacts on human health are not included in the Public Health Act, there are several parts of the Act, which are relevant to be addressed from the point of view of climate change:

- Part III: Buildings (which may be impacted by extreme events).
- Part IV: Food Sale and Distribution (which may affect nutrition-related disease).
- Part V: Sanitary Services (which may impact diarrhoeal disease).
- Part VII: Infectious Disease (which may include diarrhoeal disease).
- Part XI: Mosquitoes (which may impact dengue fever).
- Part XIII: Water Supply (which may impact diarrhoeal disease).

WHO's report Human Health and Climate Change in Pacific Island Countries (WHO, WPRO 2015), made an assessment of highest priority climate-sensitive health risks in Pacific island countries, identifying direct, indirect, and diffuse effects. For Fiji, the main direct effects are the health impacts of extreme weather events. Indirect effects identified for Fiji include water security and safety, food security and safety, vector borne diseases, zoonosis, and disorders of the eyes, ears, skin and other body systems. Diffuse effects include disorders of mental and psychosocial health, non-communicable diseases, and problems related to the health system (such as compromised access, and damage to health infrastructure). (WHO/WPRO 2015).

Box 2: Piloting Climate Change Adaptation to Protect Human Health (PCCAPHH)

WHO and MoHMS implemented a global pilot project between 2011 - 2014 designed to increase the adaptive capacity of health system institutions, including field practitioners, to prepare for, respond to, and recover from the health risks of climate variability and change. The project which included Fiji covered six other countries: Barbados, Bhutan, China, Jordan, Kenya, and Uzbekistan.

Baseline analysis identified "water stress" in relation to hydro-meteorological disasters as the theme for Fiji's project, and highlighted dengue fever, diarrhoeal diseases, leptospirosis and typhoid fever as the priority diseases for the PCCAPHH project.

The project found that climate change, through increasing temperatures, would lead to increases in the risk of dengue-fever epidemics as warm temperature favors the development of the pathogen and the mosquito vector that carries it. Studies during the project showed that elevated temperature and extreme high or low rainfall was associated with a statistically significant increase in diarrhoea. Disruption to water supply and sanitary systems during extreme weather events are observed to influence the occurrence of the climate sensitive diseases in Fiji.

The project focused on Ba in the Western Division and Suva in the Central Division the two districts vulnerable to the 'water stress' theme and the identified communicable diseases.

http://www.health.gov.fj/wp-content/uploads/2014/05/FJI_2012_Protecting_Human_health1.pdf

The MoHMS has finalized a Climate Change and Health Strategic Action Plan (CCHSAP) for 2016-2020, focusing on building resilience to climate change impacts on health systems in Fiji through appropriate adaptation strategies. Reports from the PCCAPHH project together with other regional and national climate and health adaptation plans are used as the platform for the CCHSAP 2016-2020, to direct the MoHMS in addressing climate impacts on health.

5.8 *International conventions*

At the Earth Summit in Rio de Janeiro, 1992, the three so-called "Rio Conventions" were born. These are the United Nations Framework Convention on Climate Change (UNFCCC), The Convention for Biological Diversity (CBD), and the United Nations Convention to Combat Desertification (UNCCD). Fiji is a party to the three conventions.

5.9 *UNFCCC*

Fiji ratified the Convention in 1993. The latest National Communication to the Convention was in 2013, and presents an analysis by sector, including health. Fiji's Greenhouse Gas (GHG) emissions are low. The current estimate is about 0.004% of the world's total. Table 10 shows country total emissions, per capita emissions, and percentage of the world total. Countries with very large emissions (China and USA) are shown for comparisons.

Table 10 Carbon dioxide emissions, 2011.

	Thousand metric tons 2011	Per capita (thousand tons)	% of World total
Fiji	1236	1.4	0.004
China	9019518	6.7	26.031
USA	5305570	17.0	15.312
World	34649483	4.9	100

Source: WB, 2015f (column 1); WB, 2015g (column 2)

5.10 CBD

Fiji signed the Convention at the Earth Summit in 1992. The country has a rich biodiversity and a forest area of 10000Km², and this has not changed between 1990 and 2012 (WB, 2015i). However ecosystems that support this biodiversity are at risk. Current estimates lists as threatened or endangered 25% of bird species, 11.7% of mammals, 67% of amphibians, and 11% of reptiles (CBD, 2015).

5.11 UNCCD

Fiji ratified the UNCCD in 1998, and developed its National Action Program in 2006. According to the UNCCD country profile, drought risk prevails and there are insufficient water resources for agriculture and industry. The country suffers land degradation, which is manifested in soil erosion, deforestation and nutrient loss (UNCCD, 2015)

5.12 The concept of Planetary Health

In recent years, the concept that the planet has limits, and that when these are surpassed there are consequences for human health and wellbeing, has emerged. The work of the Millennium Ecosystem Assessment (MA) is one example of these global initiatives. In 2006, WHO launched the report "Ecosystems and Human well-being – Health synthesis" which addressed the growing evidence that destroying and degrading ecosystems are detrimental to health. Ecosystems provide services, such as clean water, air, food, wood, and many other health enhancing services (WHO, 2005).

Recently, the Rockefeller Foundation and the Lancet Commission presented the report on planetary health, titled "safeguarding human health in the Anthropocene" (Whitmee et al, 2015). The report discusses the health implications of degraded natural systems; the uncertainty and potential surprises of these new threats; our inability to address these issues in the present systems of governance; and the possible solutions including promoting sustainable and equitable patterns of consumption. These emerging ideas and concerns are important to Fiji. As a vulnerable nation, so closely determined by its immediate environment, the consequences of these global drivers could be large.

6. Recommendations

H&E is at a crossroad in Fiji, facing a unique opportunity to strengthen its work by adapting to changes in environmental risks and social determinants of health, which are occurring both in the country and in the Pacific Region. The MoHMS has a long tradition in providing quality environmental health services and the Fiji National University (FNU) has been for many years a leading national and regional training institution for environmental health. These leadership roles are gradually changing. Social and environmental changes require a constant evaluation to ensure relevance and timely responses to environmental risks. The ideas presented here were synthesized from discussions with several stakeholders, including an interagency consultation organized by the MoHMS, as part of this consultation process. It is done in the form of key questions, which in one way or another, have been addressed in discussions and consultations with different stakeholders.

6.1 *Addressing Health and Environment is challenging, benefits are substantial*

Protecting health from environmental threats is a concern for health governance. The actual control of these threats is often outside the domain of the health sector. The area is multisectoral and multidisciplinary. It includes both health protection and environmental protection, and it must address the two areas in synchrony to achieve success.

The health sector does not normally manage environmental protection. That is the domain of several other sectors, which would include Environment, Water, Land and Agriculture, Meteorology, Labor, Education, Roads and Transport, among others. Thus the health sector may identify excess morbidity caused by air pollution, but the actions to control the risk factors are often in the hands of a different sector. But both sectors are responsible for responding to the problem. This arrangement works well in most instances. Levels of air pollution, or of water contamination, that should not be exceeded are determined by the health sector. Responses are determined by the monitoring of these risks by health with other sectors. Actions to assist affected people are done by the health sector, while actions to reduce the harmful levels are done by the other relevant sector.

This arrangement works well most of the time but it is not guaranteed. Health may not be aware of nor detect a problem which another sector could control (e.g. chemicals used in agriculture). Or health may be aware of a problem that no corresponding agency is addressing (e.g. levels of air pollutants). To this complexity we have to think of emerging environmental challenges, and on how we incorporate these into our work. Recently UN Member States agreed on a set of 17 SDGs. These goals and targets are a unique opportunity to work across sectors.

H&E units are often designed to address the negative aspects of the environment. Much is still needed in refocusing our understanding of the positive aspects of having a good environment. This is the concept behind the MoHMS branch addressing Wellness (as opposed to Illness). The Yanuca Island Declaration is a good example of the understanding of this concept for H&E.

This is the first challenge for the MoHMS Environmental Health program: how to work efficiently, in an increasingly multisectoral field.

6.2 *It's time to rethink Health and Environment*

Everything changes, and H&E is changing at a fast pace. Humanity has had a long history with traditional environmental risks; perhaps the oldest has been related to access to clean water, elimination of wastes, and microbiological hazards in food. Only in recent centuries we added a very different set of hazards, such as those from industry: chemicals, air pollutants, noise, and radiation. Today, perhaps only in the last few decades, we are facing global environmental changes. Climate change is probably the most serious global threat, but it's not the only one. The world is faced with increasing loss of biodiversity, ecosystem destruction, land degradation and desertification, reduced access to freshwater, and others, which directly or indirectly impact on health.

These changes are bringing new players to the field. Climate change, for example, has taken the health sector unprepared in some countries, and unable to respond to demands for information from the Environment or Climate sectors. This has resulted in these other players taking an increasing role in responding for health, when the health sector has proven unable to respond.

This is the second challenge for the MoHMS Environmental Health programme. How to simultaneously address its traditional issues and incorporate efficiently and with its limited human and financial resources, these emerging threats.

6.3 *Leading the process*

The first step is to recognize that the complexity of H&E, and the emerging global environmental changes, needs strong leadership. Today health has many players, including new institutions, civil society and NGOs, donors, sectors other than health. H&E has additional players beyond health sector, and the health sector is positioned to lead the collaboration process.

There is a recognized weakness in having H&E within the health sector, specifically the often low profile and low priority given to the program. There is strength in having H&E in the health sector, specifically because it contributes so much to prevention. WHO has estimated that around 25% of the global burden of disease could be prevented by addressing environmental risk factors. Recognizing the strengths and weaknesses of having H&E within the health sector, there is no doubt that for Fiji this is the best option, and that the key for success is to raise its profile within the sector itself, and to work with an inter-sectoral team, to guide the process.

This is the third challenge for the MoHMS Environmental Health programme. How to raise its profile within the health sector, and to lead a multisectoral group that goes beyond health

6.4 Responding to the challenges

H&E in Fiji has to address at least the three challenges identified in stakeholder consultations. These are: The issue of increasing efficiency and recognizing the importance of working across sectors; Responding to current and emerging threats without losing efficiency in the process; and raising its profile within and outside the health sector to provide leadership in the field. Some key steps are described below.

It's everybody's business

We all need to recognize that H&E is everybody's business. It is not owned by health, nor environment, nor a specific agency or institution. It's a collective that involves many players including, importantly, the communities and individuals impacted positively or negatively by their environment. This understanding will help identify our separate and collective responsibilities to address current and emerging environmental health risks.

Create synergies by working across sectors, disciplines and actors

Clearly there are multiple players in the field. This could mean that some work overlaps the work of others, that some work is done in silos, or that some work is not done. Only by working across different groups in an organized manner, can we reduce environmental threats and create health-enhancing environments. Responding to the newly launched Sustainable Development Goals is an excellent opportunity to identify synergies, and act as one.

Address emerging threats

Emerging threats are diverse, some are environmental, some are social, and some are political. Fiji is not done with the long list of traditional problems such as water, sanitation, waste; and it's now asked to consider global issues such as climate change and ecosystem degradation. There is no alternative. Threats overlap, and enhance each other. All current and emerging issues need to be part of a new H&E Program, and build on the synergies from working with other sectors.

Champions wanted

Champions are individuals, institutions, communities. We need not one but many champions, addressing one, or several issues simultaneously. We need a project that would help us join forces, and that project could be our champion. Healthy Islands has been one such champion and we need to use all the force accumulated in that spirit to continue advancing. The Fiji National University (FNU) has been a champion. Environmental health officers and other related professionals, both in Fiji and in other countries in the Pacific, have been trained at FNU. But as with other institutions and programs, FNU's H&E programme also needs to be renewed and enhanced, with updated curricula, addressing all emerging issues, combining the social with the environmental determinants of health.

Build the evidence base

Data, research, information, evidence base, all these are required for decision-making, for well-informed legislation. FNU should be strengthened in data collection and research to orient and lead this process. Major information gaps can lead to research, which a strengthened FNU could provide for the country.

Establish a permanent H&E Forum

A H&E Forum could be established by MoHMS, or FNU as a neutral forum of multiple stakeholders to progress in reducing impacts from environmental risks, and promoting wellness from enhanced environments. The Forum could be guided by the two

overarching mandates for the Pacific: the Yanuca Declaration action areas, and the SDGs.

Make the threat of climate change our best opportunity for action

We can turn climate change from a potential disaster (if we do nothing) to an opportunity to strengthen the whole H&E spectrum. Climate change is a driver for other environmental changes, and a driver for current environmental health risks.

Climate change unit needs to be established as a program within the MoHMS. However, that is not sufficient. It should become the leading program under which all other H&E issues are addressed.

In addition, a center could be established such as the Climate, Environment and Health Centre by FNU. It could serve not just MoHMS, but other ministries and sectors, and other countries in the Pacific.

All sectors are responding to the challenges of climate change. This is also an opportunity for the health sector to join interagency and intersectoral efforts to address climate change.

Most disasters are climate related. This means there is an approximation of the disaster risk reduction agenda with the climate change agenda. This includes threats to health facilities, from tropical cyclones and from sea level rise.

Occupational Health must also be included in the response. Workers, and in particular health care workers, are at the forefront of disaster and climate change responses. The Occupational Health Profile of Fiji is being prepared by MoHMS and WHO will be helpful in providing direction of this work area previously under addressed.

Recalling the words of Dr Margaret Chan, *Climate change is the defining issue for the 21st century* (WHO, 2016).

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Health and Environment Meetings

1. Environmental Health Stakeholders Consultation participants

Location: MOHMS; Namosi House; 4 th Floor Meeting Room	Date: 03/11/15	Time: 10am
Attendees:		
Department of Environment – Laisani Lewanavanua		
Land Transport Authority – Thomas Kishore, Ilai Maleba		
Water Authority of Fiji – Kirti Chandra, Sher Singh		
FNU – Railala Tavui		
WHO – Dr Rokho Kim, Dr Carlos Corvalan (consultant), Tim Hayden		
MOHMS – Kelera Oli, Manasa Rayasidamu, Suliasi Batikawai		

2. Inter-sectoral workshop participants

Participants List

Name of Participant	Organization
1. Mr. Jale Uluilakeba	Fiji Meteorological Service (FMS)
2. Ms. Arieta Baleisolomone	Fiji Meteorological Service (FMS)
3. Ms. Kolianita Alfred	Ministry of Agriculture (MOA)
4. Ms. Laisani Lewanavanu	Ministry of Local Government, Urban Development, Housing & Environment -(Department of Environment - DOE)
5. Ms. Railala Nakabea Tavui	Fiji National University (FNU)- (College of Medicine, Nursing & Health Sciences)
6. Dr. Isimeli Tukana	Ministry of Health and Medical Services (MOHMS) - (Wellness Unit)
7. Ms. Ruci Soko	Ministry of Education (MOE)- (Curriculum Development Unit, Ministry of Education)

8. Mr. Marc Overmars	The United Nations Children's Fund (UNICEF)
9. Mr. Francis Wele	Secretariat of the Pacific Community (SPC) – Consultant
10. Dr. Rokho Kim	World Health Organization (WHO)
11. Ms. Kelera Oli	World Health Organization (WHO)/MOHMS
12. Ms. Maraia Meo	World Health Organization (WHO)
13. Mr. Dip Chand	MOHMS –(Environmental Health Unit)
14. Mr. Manasa Rayasidamu	MOHMS - (Environmental Health Unit) - Secretariat
15. Mr. Elia Lawena	MOHMS –(Environmental Health Unit)
16. Mr. Suliasi Batikawai	MOHMS - (Environmental Health Unit) - Secretariat
17. Lusiana Biunaiwai	EH Rakiraki
18. Josefa Tabua	EH Ba
19. Niko Nadolo	EH Lautoka
20. Kasanita Kalisoqo	EH Suva
21. Milika Nabulivula	EH Suva

Annex

The Sustainable Development Goals

- Goal 1. End poverty in all its forms everywhere
- Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture
- Goal 3. Ensure healthy lives and promote well-being for all at all ages
- Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
- Goal 5. Achieve gender equality and empower all women and girls
- Goal 6. Ensure availability and sustainable management of water and sanitation for all
- Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all
- Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
- Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
- Goal 10. Reduce inequality within and among countries
- Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable
- Goal 12. Ensure sustainable consumption and production patterns
- Goal 13. Take urgent action to combat climate change and its impacts
- Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development
- Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
- Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
- Goal 17. Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development