

Mamara New Capital City Development Phase 1 Environment Impact Statement (EIS)

Chapter 12: Health Impact Assessment



Steve Ereinao

August 2020

Table of Contents

1.0 INTRODUCTION.....	3
1.1 Methodology	4
2.0 GUADALCANAL PROVINCE HEALTH STATUS.....	5
2.1 Health facilities/Infrastructure and Human Resources.....	5
2.2 Health Infrastructure	6
2.3 A number of Health Indicators	6
2.4 Mortality rate.....	7
2.5 Morbidity rate.....	7
2.6 Community water supply and sanitation	8
2.7 Sanitation	9
2.8 Wastes management.....	9
2.9 Health Infrastructure	9
3.0 HEALTH IMPACTS AND MITIGATION MEASURES.....	11
3.1 Diseases incidence rate (Non- communicable diseases).....	11
3.2 Occupational and health safety – accident and injuries.....	11
3.3 Demand for additional health services	12
3.4 Nutritional change.....	12
3.5 Exposure to dust and noise	12
3.6 Accident and injuries	13
3.7 Water contamination and potentially decreasing of water supply system (Mamara)...	13
3.8 Potential health positive impacts.....	14
4.0 POTENTIAL IMPACTS AND MITIGATION MEASURES	14
5.0 CONCLUSION	17
References.....	18

1.0 INTRODUCTION

This report is an assessment of the baseline health condition and potential impacts from the proposed Mamara new capital city development. The report focuses on existing health conditions on the project site, potential health impacts from project activities and measures to mitigate the potential impacts.

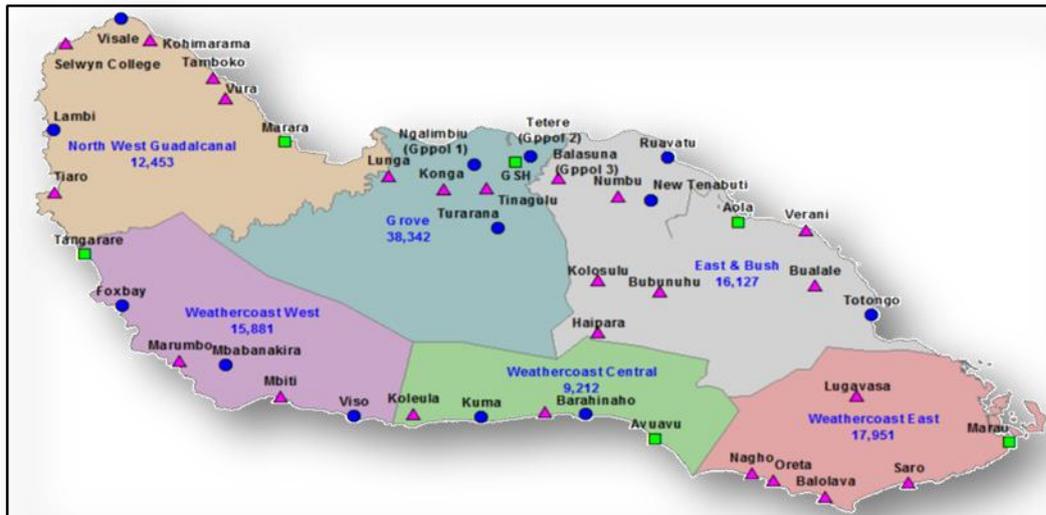
The nearest health clinic to the Mamara Real Estate Development is the Marara Area Health centre which currently located at Kakabona settlement. The Marara area health centre is staffed by four midwives' specialists, eleven registered nurses, and seven rural assistant nurses (ARNs). It has been observed that most of the community people in the Tandai ward lived along the main road, therefore, favours traveling to national medical hospitals or health clinics in Honiara. The Marara clinic is categorized as the Area Health Center (AHC) has advanced health facility in the Tandai ward.

Guadalcanal Province has six (6) health zones which covers zones are different to voting demographics as far as the political boundary (constituency) and wards boundary lines are concerned. For instance zones one in North West Guadalcanal, (Marara Area Health Center with 12,545 population), zone two weather coast west with 15,881 population (Tangarare Area Health centre), Zone three, weather coast central with 9,212 population (Avuavu Area Health center), zone four, weather coast East with 17,851 population (Marau Area Health Center), Zone five with 16,127 population, (Aola Area Health center), Zone six Grove with 38, 342 population (Good Samaritan Hospital).

Fig.1. the below table summarises population and current health facilities status in Guadalcanal Province (Source, HISGP).

Health facilities		NO
1	Total Number of Health Facilities:	44
2	Hospitals:	0
3	Area Health Centres	6
4	Rural Health Clinics	13
5	Nurse Aide Posts:	24
6	Total Number of Health facilities closed	2

Fig. 2. The Map shows Guadalcanal province health zones and its population at each zone (source, HISGP)



Marara Area Health centre is situated close to the Mamara Development site cover the boundary from Tandai and Sahalu ward in the North West Guadalcanal with seven (7) rural health clinics. These area health clinics include, Vura clinic, Tamboko health clinic, Kohimarama health clinic, Visale clinic, Selwyn College health clinic, Lambi clinic, and Tiaro clinic. The health centre and clinics serve a considerable number of people within and near the residences as people. People living in the inner land take few hours to arrive at the health centre, especially those upstream of Poha river.

Malaria, Acute Respiratory Infectious (Ari) and skin diseases are common problems in the surrounding communities of Mamara especially Kakabona and Poha upstream. Other common disease such as malaria and common cold pneumonia is also observed.

1.1 Methodology

The study approach includes collation of the health information and profile from Guadalcanal Province public health and environmental health records. Community consultation undertaken also include collation information on health and disease common to the community. The data collected and analysed includes death rate, life expectancy, morbidity rate, dietary health status, existing health infrastructure, human assets and administrations, medical problems, and predominance sicknesses, general cleanliness, and sanitation conditions.

2.0 GUADALCANAL PROVINCE HEALTH STATUS

The 2018, 2019 annual report and quarterly health report from the Guadalcanal Health Information System (HIS), stated that so far there is two health facility that closed. As a result, one maternal death was reported, four under-five deaths were reported in the first quarter of 2020. In terms of health supervisory delivery activity recent health report in 2019 stated that percentage of the supervised health delivery is 74.8 % and Unsupervised 25.2%. This means that a lot more effort needs to be taken to reach 2020 target 20% of unsupervised delivery compared to first-quarter report 2020. It further reported that nurses attended to women delivery or childbirth at 70.6 % in first-quarter 2020.

General Measles coverage for the province is 11.6 % first-quarter 2020, whereas the indicator shows the need to do more coverage to meet quarterly targets which are 22.5%. The Malaria incidence increased to 159.1 cases per 1000 populace in 2020 and perceptibly high in Marara, Grove, and Aola, and so, therefore, the total of 28 GBV cases by an inflicted intimate partner was reported for the first quarter in 2020

2.1 Health facilities/Infrastructure and Human Resources

The information has been sourced from the Department of Health Information System (DHIS)

Fig.1. Current Human resources (GP health staffs)

Human resources by zones, Guadalcanal 2020				
	Doctors	Midwives	RNs	RNAs
Aola	0	0	5	6
Avuavu	0	0	5	5
Grove	2	6	23	10
Marara	0	4	11	7
Marau	1	3	9	6
Tangarare	0	1	6	7
Guadalcanal	3	14	59	41

2.2 Health Infrastructure

The table below shows health facilities by area, all through Guadalcanal Island.

Fig. 2. Health facilities by GP health zones

Health facilities by area, Guadalcanal Province, 2020				
	Hospital	Area Health center (AHC)	Rural Health Center (RHC)	NAPs
Aola	0	1	2	4
Avuavu	0	1	2	3
Grove	0	1	3	6
Marara	0	1	2	4
Marau	0	1	1	4
Tangarare	0	1	3	3
Guadalcanal	0	6	13	24

2.3 Several Health Indicators

The table below shows what it takes per indicator throughout the previous 4 years for the Guadalcanal Province. The colours green, red, and yellow indicates a respective improvement, worsening or no change to the indicator between 2017 and 2018. Despite providing a good overview of the country's core indicators and their performance, it is important to highlight that other factors may affect the value and trend of an indicator. In this way, the "Methodological/System Issues" area accommodated for each indicator ought to be considered before making inferences or conclusions.

Fig. 3. Health indicators

Guadalcanal Province						
N0		2015	2016	2017	2018	2019
1	Diabetes	5.8	6.3	9.6	12	17.8
2	Hypertension	19.8	20.7	23.9	30.3	40.3
3	Malnourished Children under-two (%)	15.3	13.6	11.6	10.7	12.9
4	Unsupervised deliveries (%)	26.9	31.8	31.4	28.1	27.4
5	Average Antenatal Care Visits per Mother	5.7	5.5	5.8	5.5	5.8
6	Acute Respiratory Infection per 1,000 children under 5	651.5	566.1	598.9	559	420.5
7	Under-five Mortality Rate per 1,000 live births	28.4	20.2	22.5	22.4	16.3
8	Contraceptive Use per 1,000 population	123.2	182.6	251.4	288.5	302.3
9	Infant Mortality Rate per 1,000 live births	18.6	15.6	18.4	16.3	9.3
10	Malaria Mortality Rate per 100,000 population	1.9	0	1.8	0.89	0
11	Malaria Annual Parasite Incidence rate per 1,000 population	33.6	40.7	105.3	78.6	97
12	Maternal Deaths Total	0	1	2	1	4
13	Measles Rubella Vaccine Coverage (%)	62.6	46.2	77.8	63	61.7
14	Neonatal Mortality Rate per 1,000 live births	9.9	9.8	12.5	7.3	4.7
15	Outpatient Consultations Per Capita	1.6	1.6	1.9	1.8	1.7
16	Outreach activity total	284	561	468	382	945

2.4 Mortality rate

The estimate of the degree of mortality based on information from 2009 registration of Population and housing recommend that newborn child death rate declined by 6 death for every 1000 births. This is expected to decline with improvement to access to health facilities.

2.5 Morbidity rate

Major health issues reported include Diabetes, Hypertension, Malnourished Children under-two (%), Malaria Annual Parasite Incidence rate per 1,000, Maternal Deaths Total, Measles-Rubella Vaccine Coverage (%), Outpatient Consultations Per Capita, Ari, skin diseases or Bakua, influenza. Generally, the percentage of diabetes cases present at a health facility increased in 2019 compared to decline cases was reported in previous years. This indicating

there is a need to address the lifestyle disease at the community level about the risk factors of Non-communicable diseases. Marara, Avuavu, Grove, Maru, and Tangarare show a notable increased in the percentage of diabetes cases present at the health facility and lowest was observed for Aola in 2019. This indicates the need to address or provide information related to the risk factors of developing NCD at the community level. Additionally, so like in refer to the Solomon Island 2009 census reported leading cause of morbidity in patient care are as follows

- Acute respiratory infectious (ARI)
- Clinical and presumptive diseases
- Skin diseases
- Ear infection
- Yaws (chronic infection of skin, bones, and joints)
- Red eye

Interestingly as to compare the prevalence rate of communicable disease has overtaken for the last 10 years by lifestyle diseases (non-communicable disease), this is reality as referred to the 2009 disease prevalence rate.

2.6 Community water supply and sanitation

The strategic plan for rural water supply, sanitation, and hygiene 2015 – 2019 stated that over 652,858 people in Solomon Islands – 80% of the population live in rural areas whereas most people living in rural communities lack access to clean water and proper sanitation and do not practice proper hygiene behaviours. Open defecation is common and handwashing with soap, after defecation or before eating or handling food is not widely practiced. Inadequate water, sanitation, and hygiene contribute to the prevalence of diarrhoea and other diseases and to a high level of malnutrition in the country.

The world health organization estimated that 8% of all deaths in the Solomon Island are WASH-related, in addition, community members mostly women and girls spend hours each day collecting water for their families, time which could be used more productively on other tasks (*Rural Water Supply, Sanitation and Hygiene, 2015*).

The primary water source for savouring for the Guadalcanal people is essentially from the gravity water supply, rain catchment water tanks. Many people living along the beachfront so like at the Guadalcanal plain, including the Mamara development catchment area, for the most part, utilizes water rain catchment tank and well (i.e. hand-dug man-made wells) that

can be made of cement culverts, 44gallon drums sizes. These sources are vulnerable to contamination, particularly during stormy seasons; likewise, are additionally vulnerable to the dry season. In most of the villagers' water distribution system was either damaged or not working. Community settlement close by the Mamara development site fundamentally got their drinking water from the Mamara spring which will be directly affected by the development.

2.7 Sanitation

Most of the Guadalcanal island family units are without access appropriate sanitation facilities. This is according to the RWASH policy strategy 2014 which recorded that Solomon Islands has a very low coverage of sanitation with 18% a bit lower than water supply coverage. This indicated that most household private family units exploiting bushes or ocean for the purpose of defecation in the country. No accurate information collected to update the current sanitation facilities on Guadalcanal Island however it remains a major challenge to be addressed.

2.8 Wastes management

For the local community, the household setting has normally disposed of solid wastes in their back yards while the nearby sea settlement uses the sea as the open dumping for most of the domestic wastes.

2.9 Health Infrastructure

The only Hospital in the Guadalcanal Province is the Good Samaritan Mini Hospital, although it still categorized as an Area Health Center but in terms of facilities and services provided it is quite advance and produce quality services compared to other facilities throughout Guadalcanal. The hospital is located at Grove in the central Guadalcanal political boundary Ghaobata ward and accommodated major clinical services such as the dental clinic, radiological, pharmaceutical, and medical and malaria laboratory, mini operation theatre.

All other preventable supportive services such as the Environmental health, health promotion, malaria, and nutritional/dietetic unit, HIS, and other health program administration are located at the provincial health headquarter which is at the Rita Eleven building opposite the Pacific Casino in Honiara. Guadalcanal has access to health facilities by road access and so people or villages without medication living in remote areas can only be reached by boat (OBM) and other health visits by doctors and nurses.

Fig. 4. Good Samaritan Hospital



Good Samaritan Hospital front view and patients waiting for medical attention



**Fig. 5. Above Marara Area Health Clinic (front view)
Nurse on duty**

Guadalcanal health services facilities are distributed by zones in which each health zones are managed by the Area health center and so, therefore, as per the below-described table summarises health clinics by area.

Fig. 6. Health facilities by GP health zones

Health facilities by area, Guadalcanal Province, 2020				
	Hospital	Area Health center (AHC)	Rural Health Center (RHC)	NAPs
Aola	0	1	2	4
Avuavu	0	1	2	3
Grove	0	1	3	6
Marara	0	1	2	4
Marau	0	1	1	4
Tangarare	0	1	3	3
Guadalcanal	0	6	13	24

3.0 HEALTH IMPACTS AND MITIGATION MEASURES

The following health issues will need to be addressed as a result of the proposed Mamara new capital city real estate development.

3.1 Diseases incidence rate (Non- communicable diseases)

The Mamara real estate involves many physical activities that require several laborers, and population increase. The access to new opportunities and finance means that communicable and non-communicable diseases would likely increase. Non-communicable diseases are a leading disease related to lifestyle that will require better health management system. Other diseases such as acute respiratory diseases (ARI), TB, Malaria outbreak, diarrheal, HIV/STI viral diseases and even teenage pregnancy are likely to also increase.

3.2 Occupational and health safety – accident and injuries

Occupational safety and health issues from accidents and injuries, and deaths are likely to increase. Major construction will result in longer working hours that will affect lifestyle and families. All these factors will also be further compounded by work conditions and unsafe work environment if no proper enforcement is being undertaken.

3.3 Demand for additional health services

The Mamara real estate development will build 1234 family houses. Given the SI context where an average household is about 6 individuals for each family unit, the approximate population potential would be around 7400 to 10,000 or more individuals. The associated demand for education and health facilities will increase as a result.

3.4 Nutritional change

The development will affect the economic structure of the nearby communities as new opportunities emerge. The demand for processed food will increase resulting in new nutritional habits and lifestyle. With the health records already pointing towards lifestyle disease as a major issue for Tandai, the development of Mamara may well contribute toward the same health trend and threats.

3.5 Exposure to dust and noise

Development activities requires site clearing, transportation of gravel from the quarry site to the construction area purposely for back filling of the development site. This activity will generate dust and noise and is a threat to community health near the project area.

The quality of air within the proposed project area is typical of a rural setting in the Solomon Island. There are no air quality non-attainment areas in the vicinity that is deemed an issue of concern. Construction and operation activities can be sources of dust pollution. There would be short-term dust impacts during excavation and reclamation work although this would be limited to fugitive dust emissions and emissions from machinery and vehicles used and dust control would be followed during construction. There would be no negative long-term adverse impacts on air quality during preconstruction and construction phases.

There are no noise standards in Solomon Islands, and as any noise generated by the subproject will be temporary (i.e. during construction) and intermittent, preparing a baseline of ambient noise levels for subsequent monitoring is not considered warranted.

Construction noise are generally intermittent, attenuates quickly with distance, and depends on the type of operation, location, and function of equipment. During the constructions, there will be a temporary impact due to the noise from construction machineries, especially when operations activities are carried out close to residents. Noise will become a concern during operation of the city from commercial and residential activities to name a few. The city

council will enact by laws and guidelines to comply with international best practice. World Bank standard noise levels can be used as a guide¹.

Table 1: WB Noise guide.

Table 1.7.1- Noise Level Guidelines⁵⁴		
	One Hour L_{Aeq} (dBA)	
Receptor	Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Residential; institutional; educational⁵⁵	55	45
Industrial; commercial	70	70

Exposure – solid, liquid, and hazardous wastes

The development will generate solid wastes that comes from untreated wastes water, stormy water runoff, and hazardous wastes that may have an impact on the health population. Nearby communities are the most vulnerable as they will have to deal and address waste issues that they are not familiar with. There is also the possibility of wastes being discharged into the rivers, streams, and marine environment. The threat to health includes respiratory breathing problems, waterborne diseases, breeding sites for mosquitos, and other rodents.

3.6 Accident and injuries

Phase 2 stage of the development will involve more heavy work that include concrete construction, digging for profiling of building, and all sorts of construction involvement. There will also be construction of township feeder roads, drainages, pathways, buildings, construction of septic tanks (powerhouse, wastewater treatment facility, and water bottling). The construction site could lead to possible occupational and health hazards to the workers, from accidents.

3.7 Water contamination and potentially decreasing of water supply system (Mamara)

Population increase from the development will lead to the contamination of the Mamara River and an increase in demand that could threaten the water source. Increased human

¹<https://www.ifc.org/wps/wcm/connect/4a4db1c5-ee97-43ba-99dd-8b120b22ea32/1-7%2BNoise.pdf?MOD=AJPERES&CVID=Is4XYBw>

activity during construction and the full operation will lead to pollution of the rivers, coastline and waterways threatening human health.

3.8 Potential health positive impacts

The master plan for Mamara development will also include health services such as a mini hospital, school facilities, and sporting facilities that will support the wellbeing of the community. Increased employment opportunity for skilled and non-skilled employee means improved community wellbeing and standard of living and the ability to afford better health care.

4.0 POTENTIAL IMPACTS AND MITIGATION MEASURES

The following is a summary of the potential health impacts and mitigation measures for the proposed development. It is expected that Guadalcanal provincial health authorities will provide support to Metropolis Mamara Development Ltd in addressing many of the health-related concerns.

Activity phases	Potential risks (Likely negative health Impacts)	Proposed Mitigation Measures
1. Phase (1) - Land clearing and backfilling (preparatory construction phase) i.e. gravel extraction reclamation stage	<ul style="list-style-type: none"> Disease incidence rate – communicable diseases 	<ul style="list-style-type: none"> -Always wear protective clothes from dust and other injuries -regular health monitoring provincial health centres at Marara - new health facilities (mini hospital)
	<ul style="list-style-type: none"> Occupational health & safety – increases chances of accidents air and water-borne diseases 	<ul style="list-style-type: none"> -Develop a standard OHS-Occupational health & safety program plan -Develop a policy for public and worker safety -work along with Environmental Health OHS unit for more awareness and protective measures training



	<ul style="list-style-type: none"> • Demand for additional health services 	<ul style="list-style-type: none"> -Provide health infrastructure support such as an ambulance on standby Support existing health clinic such as Marara area health centre - company to contract medical officer to monitor health safety and taking care of workers health.
	<ul style="list-style-type: none"> • Nutritional status – process of food consumption 	<ul style="list-style-type: none"> -Company to provide balanced diet and healthy amount of food to its workers
	<ul style="list-style-type: none"> • Exposure to dust and noise 	<ul style="list-style-type: none"> - Ensure noise and dust protective equipment are available - Provide PPE to employee
	<ul style="list-style-type: none"> • Accident and injuries 	<ul style="list-style-type: none"> -Design and implement an OHS health program plan for the project -all staffs must effectively follow standard OHS plan
2. Phase (2) – Construction of roads, drainages, pathways, buildings, septic tanks (powerhouse, wastes water treatment facility and water bottling)	<ul style="list-style-type: none"> -Disease incidence rate – communicable diseases 	<ul style="list-style-type: none"> -Always wear protective clothes to dust and other injuries - More awareness on lifestyle nutrition and habits.
	<ul style="list-style-type: none"> -Occupational health & safety – increases chances of accidents air and water- borne diseases 	<ul style="list-style-type: none"> -Develop a standard OHS- Occupational health & safety plan or guideline - Implement Environmental Health OHS guidelines
	<ul style="list-style-type: none"> Accident and injuries 	<ul style="list-style-type: none"> - Implement Environmental Health OHS guidelines
	<ul style="list-style-type: none"> Accommodate the needs and health welfare of staffs/workers of the project 	<ul style="list-style-type: none"> -Develop a health management plan that will take of staff's health welfare

3. Phase (3) - operational stage, residential, commercials, sports, and social facilities	<p>Disease incidence rate – communicable diseases</p> <ul style="list-style-type: none"> - Overharvesting of natural resources –less intake of balanced diet food 	<ul style="list-style-type: none"> -Develop a health taskforce or healthy committee that is responsible for the health and welfare of the new city -work along with Ministry of health, for more health awareness, IEC materials
	<p>Problem of wastes segregation</p> <ul style="list-style-type: none"> • Increases in domestic/household wastes • High chances of increase of pests/insects and other rodents to be present in the locality. • Malarial and dengue breeding site increases 	<ul style="list-style-type: none"> -Wastes management plan developed for new city -Collaborate with health relevant department for further training wastes basic management -Mamara New Capital City to provide wastes collection vehicles
	<ul style="list-style-type: none"> • Nutritional status – alteration of process of food consumption 	<ul style="list-style-type: none"> -Support local agriculture and -food production -establish strong collaboration with respective ministry or organisation for further training and awareness
	<ul style="list-style-type: none"> • Exposure – solid, liquid hazards wastes 	<ul style="list-style-type: none"> -Ensure noise reduction equipment to be provided - Provide PPE to employees

Fig. 7. Impacts and Mitigation Measures

5.0 CONCLUSION

Major health threats from the development includes exposure to clouds of dust from heavy vehicle machines, excavation and transport of soil and gravel which can lead to Acute respiratory infections (ARI), clinical and presumptive diseases, skin diseases, ear infection, and red eye and other airborne and water-related diseases. Accidents and injuries are also high risks in addition to the current prevalence diseases on Guadalcanal such as diabetes, malaria, STI and common flue.

There is a strong correlation from the baseline studies between population that live nearby township high incidence and vulnerability to lifestyle diseases. It is highly likely that there will be an increase on non-communicable diseases and other lifestyle disease for the nearby communities. The influx of new population during the operation phase means that new exposure to new disease for the community of Mamara and an increased risk from anti-social behaviours and harm.

It is recommended that health measures and health management plans be developed by the Guadalcanal health authorities in collaboration with the developer to ensure that health related issues are adequately addressed. The proposal for a new Mamara city council will be important as they will play the leading role in managing and monitoring health related issues for the new city. They will also be responsible to support health facilities and provision of health and pharmaceutical needs that will serve the community.

References

1. Statistics.gov.sb. 2020. *Population - Solomon Islands National Statistics Office*. [online] Available at: <https://www.statistics.gov.sb/statistics/social-statistics/population> [Accessed 6 July 2020].
2. Who.int. 2020. [online] Available at: <https://www.who.int/docstore/peh/noise/Comnoise-1.pdf> [Accessed 13 July 2020].
3. Roe, D., 1993. *Prehistory Without Pots: Prehistoric Settlement and Economy of North-West Guadalcanal, Solomon Islands*. [online] Openresearch-repository.anu.edu.au. Available at: <https://openresearch-repository.anu.edu.au/handle/1885/8040> [Accessed 17 July 2020].
4. Sirwash.weebly.com. 2015. *Rural Water Supply, Sanitation and Hygiene*. [online] Available at: https://sirwash.weebly.com/uploads/4/2/7/6/42764129/si_rwash_strategic_plan_final_marc_h_2015.pdf [Accessed 18 July 2020].