

FSM Department of Environment, Climate Change and Emergency Management (FSM DECEM)

Mission Report

Subject: Assessment of Pohnpei Southern Islands region Public Infrastructures (PIs) and Adaptation Fund (AF) project sites on Nukuoro and Kapingamarangi with FSM DECEM in Collaboration with Pohnpei State EPA and T & I offices

Duration of Mission: April 26 to May 3, 2020

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Objectives

1. Public Infrastructures assessment activities on Sapwuafik, Nukuoro, and Kapingamarangi
2. Adaptation Fund project sites and water storage structure assessment and water quality assessment activities on Nukuoro and Kapingamarangi

Trip Summary

This trip began departing the Pohnpei Port Authority dock on Sunday April 26, 2020 at about 8:45 a.m. on FSM's MS Caroline Voyager.

The first island we arrived at was Sapwuafik at about 5:00 p.m. on Sunday April 26, 2020. Because the ship arrived late in the afternoon, we had to spend a night on the ship outside the reefs of Sapwuafik. On early next morning, Monday April 27, the DECEM/PI team, which includes Gordon, Strick and Snyther went onshore and conducted the public infrastructures (PI) assessment for Sapwuafik. The PIs on Sapwuafik include the elementary school, ECE center, municipal office, dispensary, SDA church, catholic church, protestant church, and the community nahs. All these PIs were assessed and documented with pictures taken for each of the PIs. The assessment for each PI includes GPS location and altitude, building measurements, number of floors and rooms, building structure and roofing conditions, water storage availability and condition, toilet facility availability and condition, and communication system availability. The team completed the assessment in the afternoon and went back to the ship. At about 6:00 p.m. on Monday April 27, 2020, the ship departed Sapwuafik island and headed south to Nukuoro island.

Shown below are the public infrastructures assessed on Sapwuafik island:



Sapwuafik School



Sapwuafik Municipal Office



Sapwuafik ECE Center



Sapwuafik Dispensary



Sapwuafik Community Nahs



Sapwuafik SDA Church



Sapwuafik Catholic Church



Sapwuafik Protestant Church

At noon on Tuesday April 28, 2020, the ship arrived at Nukuoro Island. Though the seas were rough with big waves and strong wind, the ships' motor-boat managed to bring our team on shore and dropped us off at Nukuoro municipal office, where we met and briefed the mayor rep of our assessment activities. The entire DECEM team, which includes the PI team and the AF team, all went onshore to conduct both the Public Infrastructures (PI) assessment and the Adaptation Fund (AF) project site assessment. The AF team includes Richard, Morthy, Quintin, and Elson. Both Quintin and Elson represent Pohnpei state EPA to conduct the water quality testing and assessment for the water storage sites for the AF project on Nukuoro.

The PI assessment on Nukuoro includes the municipal office, dispensary, community nahs, protestant church, elementary school buildings, and the weather station rain gauge. All these PIs on Nukuoro were assessed and documented with pictures taken for each of the PIs. The assessment activities include GPS location and altitude, buildings measurements, number of floors and rooms, building structure and roofing conditions, water storage availability and condition, toilet facility availability and condition, and communication system availability. Shown below are the PIs assessed on Nukuoro.



The AF project sites assessment on Nukuoro include the dispensary & municipal water tank, protestant church water tank, elementary school water tank, Adelaide Henry water well, Senard Leopold water well, Richard Fred water well, and Jano Rudolph water well. Total of seven (7) AF sites on Nukuoro, which include 3 tanks and 4 wells, and all sites were assessed and documented with pictures taken for each site. The assessment activities include GPS location and altitude, tank/well measurements, water storage structure and roofing conditions, water storage usage, and most importantly the water quality testing for each of the water storage/site. The water quality test includes e-coli, total coliform bacteria, chlorine residual, temperature, turbidity unit and the pH reading. Shown below are the 7 AF sites assessed on Nukuoro.



The team completed the PIs and the AF sites assessments at around 4:00 p.m. and returned to the ship. At about 7:00 p.m. on Tuesday April 28, 2020, the ship departed Nukuoro island and headed south towards Kapingamarangi island.

On Wednesday April 29, 2020, at about 11:00 a.m. the ship arrived at Kapingamarangi island and the weather was much calmer than it was the day before. On the first boat trip from the ship to the island, the DECEM team boarded and got onshore at the Kapingamarangi dock. The team then gathered at the municipal office, met and briefed the acting mayor and then started the assessment activities.

The PI assessment on Kapingamarangi includes the municipal office, dispensary, community nahs, protestant church, catholic church, elementary school buildings, bridge, and the weather station rain gauge. All these PIs on Kapingamarangi were assessed and documented with pictures taken for each PI. The assessment activities also include GPS location and altitude, buildings measurements, number of floors and rooms, building structure and roofing conditions, water storage availability and condition, toilet facility availability and condition, and communication system availability.

Shown below are the public infrastructures that were assessed on Kapingamarangi:



The AF project sites assessment on Kapingamarangi includes the municipal water tank, protestant church water well, elementary school water tank, community nahs water tank, catholic church water tank, and four (4) community and public water wells. Total of nine (9) AF sites and five (5) repaired water tanks were assessed and documented on Kapingamarangi with pictures taken for each site. The assessment activities also include GPS location and altitude, tank/well measurements, water storage structure and roofing conditions, water storage usage, and the water quality testing for each of the water storage/site.

Below are the 9 AF sites that were assessed on Kapingamarangi:



Shown below are some of the water tanks that the AF project repaired for community use on Kapingamarangi:



Below are the SPC-FSM RENI project water tanks/sites on Kapingamarangi that the team also noted and tested the tanks water quality.



The ship spent a night at Kapingamarangi and completed its offloading and backloading on Thursday April 30, 2020. At about 7:00 p.m. of April 30, the ship departed Kapingamarangi and headed back to Nukuoro Island. At 11:00 a.m. on Friday May 1, 2020, the ship arrived at Nukuoro. The ship also spent another night at Nukuoro due to offloading, backloading and some unfinished/uncompleted missions from other offices to do on Nukuoro. At about 2:00 p.m. on Saturday May 2, 2020, the ship departed Nukuoro and headed straight back to Pohnpei, skipped Sapwufik island. At 5:00 p.m. on Sunday May 3, 2020, the ship docked at Pohnpei Port Authority dock in Tekehtik. This trip was completed without any complications. Weather was an issue at times with several heavy rains and big waves between Nukuoro and Kapingamarangi, but everything went well and the team returned home safely.

DECEM Team



Trip Findings and Recommendations

Refer to Tables 1 and 2 on the following pages for the Public Infrastructures (PI) assessment results (Table 1) and the Adaptation Fund (AF) project sites and water quality test assessment results (Table 2).

Refer also to Maps 1 to 5 herewith for the locations of Sapwuafik island PIs, Nukuoro island PIs, Kapingamarangi island PIs, and the locations of AF sites for Nukuoro and Kapingamarangi islands. Google maps for both assessments were also generated using the data collected from the assessments and was shared for office use and AF project use.

Overall observations:

- Most of the public infrastructures on the islands have good structure condition (concrete floor and walls), however they are not feasible for emergency shelter due to number of entry-exit for the buildings, with rusted roofing, run-down doors, windows and ceilings. All buildings only have one entry point which is also used as an exit point.
- What we observed with regards to water security is that there is no water security on Sapwuafik and Nukuoro. The water tanks on Kapingamarangi are mostly repaired by the AF project with stand-alone water catchment system with most of their public tanks. The public water tanks on Kapingamarangi were all full of water as observed. On Sapwuafik and Nukuoro islands, though the public buildings have tin roofing, the roofing is rusted with only few gutters attached as water catchment system for the tanks. The public water wells on Nukuoro were all in poor conditions having no cover at the top and poor well structure. We were fortunate to have a portable testing kit with regards to testing the quality of the water in the water storage tanks and wells to check the quality of the water. As a result of the water quality tests, most of the public water systems on Nukuoro and Kapingamarangi contain E-Coli and Coliform Bacteria, which is not safe for drinking. The public tanks on Sapwuafik island were not tested.
- Regarding drought assessments on the islands, most of the public water tanks are full with one or two tanks about 75% full. Both Nukuoro and Kapingamarangi islands have water wells with about 3ft to 4ft of water level. Sapwuafik island have public water tanks available but none water well assessed.
- Only Sapwuafik island has wifi connection using satellite. None on Nukuoro and Kapingamarangi. However, all three (3) islands have VHF radio for communication purposes.

Overall recommendations:

- For water security on the islands, public building roofing needs to be fixed and have gutters attached to the entire roof for water catchment system. Promote stand-alone water catchment system on other outer islands.
- For emergency purposes, most public buildings, especially the municipal office and dispensary buildings need to renovate roofing, ceiling, windows and doors.
- EPA's portable water testing kit should also be used for testing the public water systems on the other outer islands in Pohnpei, to fully assess all public water systems for all the outer islands of Pohnpei.

Table 1: Summary of PI assessments on Sapwuafik, Nukuoro, and Kapingamarangi Islands

	Type of PI	Island	Assessment date	Building/Structure						Water Storage			Toilet	
				Structure Material	Roofing Material	Structure Measurements	# of Floors	# of Rooms	Structure Condition	# of Water Storage	Water Tank Capacity	Water Tank Condition	# of Toilet	Toilet Condition
1	School building (office & classrooms)	Sapwuafik	4/27/2020	Concrete structure	Concrete	141'-0" x 33'-6"	2	7	Good	4 Water tanks	1.5k gal.	Good	4 Toilets	In use, but need to replace seat and fix flush level
2	School building (library & classrooms)	Sapwuafik	4/27/2020	Concrete structure	Concrete	32'-2" x 29'-5"	1	1	Good	None			None	
3	School building ECE Center	Sapwuafik	4/27/2020	Concrete and wood	Tin	36'-0" x 24'-0"	1	2	Good	1 Water tank	500 gal.	Good	2 Toilets	Good
4	Government building Municipal Office	Sapwuafik	4/27/2020	Concrete	Tin	40'-2" x 36'-2"	2	9	Good	1 Water tank	500 gal.	Good	None	
5	Church building SDA Church	Sapwuafik	4/27/2020	Concrete	Tin	42'-5" x 24'-4"	1	1	Good	1 Water tank	250 gal.	Damaged	None	
6	Government building Dispensary	Sapwuafik	4/27/2020	Concrete	Tin	32'-2" x 31'-0"	1	5	Good	3 Water tanks	250 gal. & 500 gal.	Good	1 Toilet	Good
7	Nahs Community	Sapwuafik	4/27/2020	Concrete	Tin	25'-0" x 50'-0"	1	1	Good	1 Water tank	1.5k gal.	Good	None	
8	Church building Catholic Church	Sapwuafik	4/27/2020	Concrete	Tin	76'-1" x 23'-7"	1	2	Rusted	1 Water tank	1000 gal.	Good	None	
9	Church building Protestant synagogue	Sapwuafik	4/27/2020	Concrete and wood w/ tin walls	Tin	48'-0" x 16'-0"	1	1	Rusted	1 Water tank	250 gal.	Good	None	
10	Church building Protestant Church	Sapwuafik	4/27/2020	Concrete	Tin	50'-2" x 33'-5"	1	1	Rusted	None			None	
11	Nahs Community	Nukuoro	4/28/2020	Wood	Thatch	29'-0" x 16'-8"	1	1	Good	None			1 Pit Latrine	
12	Government building Municipal Office	Nukuoro	4/28/2020	Concrete	Tin	41'-5" x 43'-0"	1		Rusted	1 Water tank	1500 gal.	Good	1 Pit Latrine	
13	Government building Dispensary	Nukuoro	4/28/2020	Concrete	Tin	30'-0" x 41'-3"	1	2	Rusted	1 Water tank	250 gal.	Good	1 Pit Latrine	
14	Church building Protestant Church	Nukuoro	4/28/2020	Concrete	Tin	60'-0" x 29'-3"	1	1	Good	1 Water tank	500 gal.	Damaged	1 Pit Latrine	
15	Nahs Church	Nukuoro	4/28/2020	Wood	Thatch	29'-11" x 16'-9"	1	1	Good	1 Water tank	250 gal.	Good	1 Pit Latrine	
16	School building Classrooms	Nukuoro	4/28/2020	Concrete	Tin	57'-0" x 32'-0"	1	2	Good	2 Water tanks	500 gal.	Good	2 Toilets	Good
17	School building School Office	Nukuoro	4/28/2020	Concrete	Concrete	32'-0" x 29'-4"	1	2	Good	None			None	
18	School building Classrooms	Nukuoro	4/28/2020	Concrete	Tin	40'-3" x 20'-2"	1	2	Good	None			None	
19	Nahs Community	Kapinga	4/29/2020	Wood	Thatch	43'-1" x 17'-0"	1		Good	None			None	

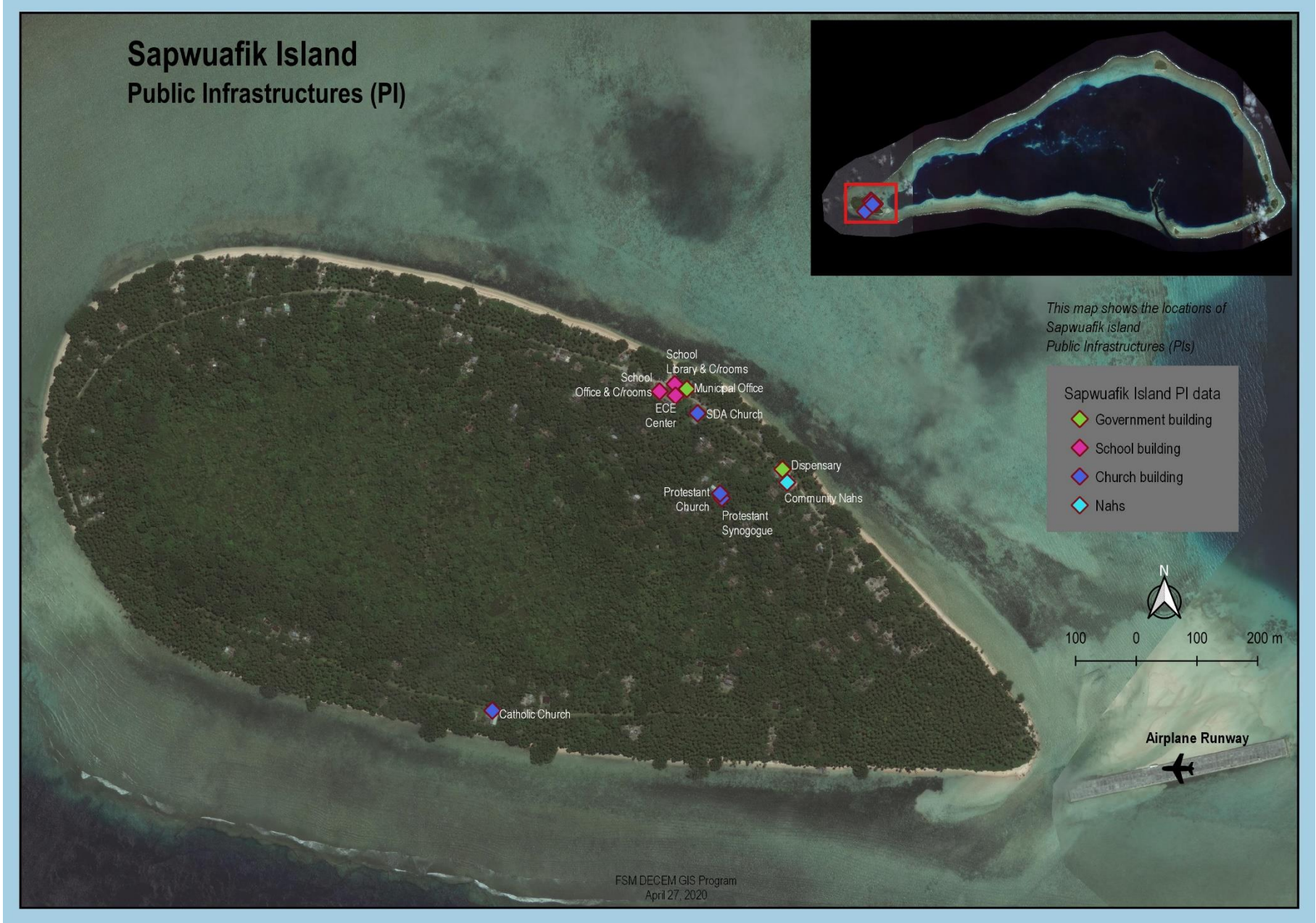
20	Government building Dispensary	Kapinga	4/29/2020	Concrete	Tin	28'-1" x 24'-0"	1	5	Good	2 Water tanks	1500 gal.	Good	1 Toilet	In-use, but leaking water tank
21	Church building Protestant Church	Kapinga	4/29/2020	Concrete	Tin	80'-8" x 29'-2"	1	2	Good	3 Water tank & 1 well	1500 gal.	Good	None	
22	Government building Municipal Office	Kapinga	4/29/2020	Concrete	Concrete	37'-2" x 44'-0"	1	4	Leaking ceiling	1 Water tank	250 gal.	Damaged	1 Toilet	Good
23	Nahs Community	Kapinga	4/29/2020	Wood	Thatch	37'-3" x 16'-4"	1		Good	1 Water tank	1500 gal.	Good	None	
24	Church building Catholic Church	Kapinga	4/29/2020	Concrete	Tin	42'-3" x 18'-0"	1	1	Damaged, run down	1 Water tank	5000 gal.	Damaged	None	
25	School building School Office and Classrooms	Kapinga	4/29/2020	Concrete	Tin	187'-0" x 33'-0"	2	8	Good	6 Water tanks	1500 gal. & 250 gal.	6-Good; 2-Cracked	2 Toilets	In-use, but leaking water tank
26	School building Classrooms	Kapinga	4/29/2020	Concrete	Tin	32'-2" x 29'-5"	1	2	Good	1 Water tank	250 gal.	Good	None	
27	School building School toilets	Kapinga	4/29/2020	Concrete	Tin	10'-0" x 6'-0"	1	2	Leaking water	1 Water tank	250 gal.	Good	2 Toilets	In-use, but leaking water tank

Table 2: Summary of AF sites assessments on Nukuoro and Kapingamarangi Islands

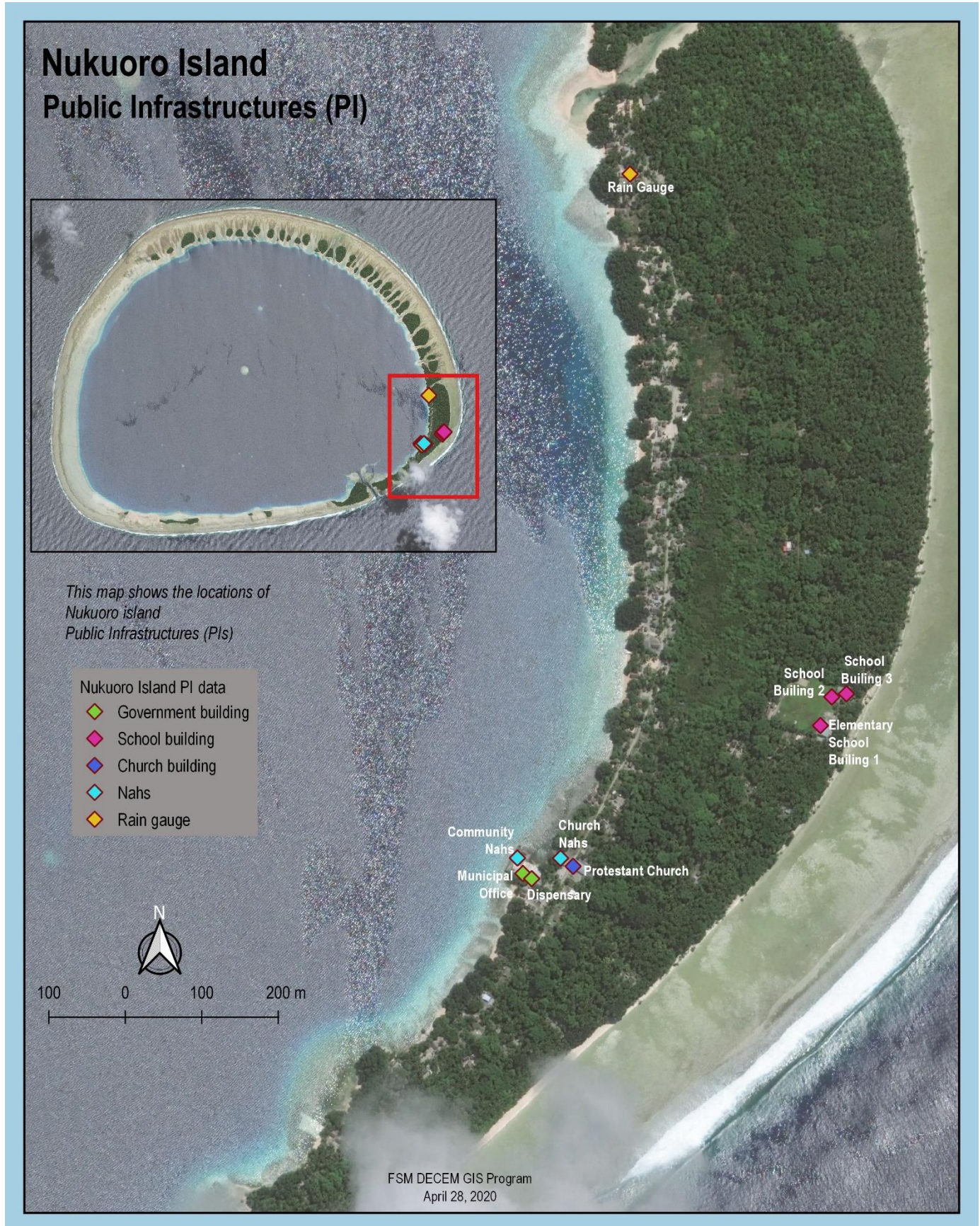
AF Site #	Island	AF Site Name	Assessment date	Water Quality Tests Results					Water Storage Structure Assessment					
				Assessed time	*TC	*E-Coli	pH	*NTU	# of Water Storages	Water Storage Material	Measurements	Capacity	Structure Condition	Comments & Recommendations (Structure)
1	Nukuoro	Dispensary Tank	4/28/2020	10:25	Present	Absent	-	0.28	1 tank	Plastic	6ft x 6ft	1500 gal.	In use with rusted roofing, gutters and uneven base	Need to change the cutters and fix the base
2	Nukuoro	Protestant Church Tank	4/28/2020	10:50	Present	Present	-	4.11	1 tank	Concrete w/ tin roof	6ft x 4ft	250 gal.	Damaged – cracked	Insert cutters and fix the cracks
3	Nukuoro	Adelaide Henry Community Well	4/28/2020	11:10	Present	Present	7.19	3.75	1 well	Concrete w/ tin roof	4ft-diameter/6ft-depth/4ft-water level		Good – in use	Need to extend above ground, with concrete base, and new roofing
4	Nukuoro	Elementary School Tank	4/28/2020	11:49	Present	Present	-	0.27	2 tanks	Concrete w/ concrete roof	6ft x 5ft	10000 gal.	Good – in use	Only small portion of the roofing has cutter - add more cutters
5	Nukuoro	Senard Leopold Well	4/28/2020	12:23	Present	Present	7.7	1.22	1 well	Coral w/ no roof	5ft-3inch-diameter		Good – in use	Improve the well by using concrete structure, extend above ground, with concrete base and new roofing
6	Nukuoro	Richard Fred Well	4/28/2020	1:13	Present	Present	7.8	0.24	1 well	Coral w/ no roof	4ft-5inch/6ft-9inch-depth		Good – in use	Improve the well by using concrete structure, extend above ground, with concrete base and new roofing

7	Nukuoro	Jano Rudolph Community Well	4/28/2020	1:35	Present	Present	8.13	5.16	1 well	Coral w/ no roof	4ft square/6ft-depth		Damaged – plants and grass growing inside	Improve the well by using concrete structure, extend above ground, with concrete base and new roofing	
1	Kapinga	Protestant Church Well	4/29/2020	11:22	Present	Absent	7.48	0.51	1 well	Concrete w/ no roof	5ft square/ 9ft-depth		Good – in use	Need to extend above ground with concrete base and new roofing	
2	Kapinga	Municipal Office Tank	4/29/2020	11:30	Present	Absent	-	1.52	1 tank	Concrete w/ no roof	6ft x 6ft	1500 gal.	Good – in use	Install new tank with new cutters	
3	Kapinga	Tudua Ngake Well	4/29/2020	12:15	Present	Present	7.34	0.84	1 well	Concrete w/ no roof	5ft square/ 9ft-depth		Good – in use	Install concrete base and new roofing	
4	Kapinga	Werua Community Well	4/29/2020	12:56	Present	Present	7.13	1.18	1 well	Concrete w/ no roof	5ft square/ 9ft-depth		Good – in use	Install concrete base and new roofing	
5	Kapinga	Community Tank	4/29/2020	Not Tested						1 tank	Concrete w/ concrete roof	6ft x 5ft	1000 gal.	Good but not in use due to no water catchment	Need water catchment to fill in the tank - stand alone roofing for water catchment
6	Kapinga	Catholic Church Tank	4/29/2020	Not Tested						1 tank	Concrete w/ no roof	8ft x 5ft	5000 gal.	Damaged – cracked walls	Fix the cracks, install stand alone roofing for water catchment for the tank
7	Kapinga	Elementary School Tank	4/29/2020	1:30	Present	Present	-	0.21	2 tanks	Plastic	6ft x 6ft	1500 gal.	Good – in use	Install new tank with stand alone roofing for water catchment	
8	Kapinga	Talai Community Well	4/29/2020	2:00	Present	Present	7.69	1.47	1 well	Concrete w/ no roof	5ft square/ 9ft-depth/3ft-water level		Good – in use	Install concrete base and new roofing	
9	Kapinga	Section # 3 Community Well	4/29/2020	2.:17	Present	Present	7.55	1.09	1 well	Concrete w/ no roof	5ft square/13ft-depth/4ft-water level		Good – in use	Install concrete base and new roofing	
10	Kapinga	AF repaired tank 1	4/29/2020						1 tank	Concrete w/ tin roof	6ft x 6ft	5000 gal.	Good – in use	Still has some cracks outside the tank wall	
11	Kapinga	AF repaired tank 2	4/29/2020						1 tank	Concrete w/ tin roof	6ft x 6ft	5000 gal.	Good – in use	Still has some cracks outside the tank wall	
12	Kapinga	AF repaired tank 3	4/29/2020						1 tank	Concrete w/ tin roof	6ft x 6ft	5000 gal.	Cracked outside	Still has some cracks outside the tank wall	
13	Kapinga	AF repaired tank 4	4/29/2020						1 tank	Concrete w/ tin roof	6ft x 6ft	5000 gal.	Good		
14	Kapinga	AF repaired tank 5	4/29/2020						1 tank	Concrete w/ tin roof	6ft x 6ft	10000 gal.	Good		
15	Kapinga	Municipal Office_New Tank	4/29/2020						1 tank	Plastic	6ft x 6ft	1500 gal.	Yet to install		
16	Kapinga	Elementary School_New Tank	4/29/2020						1 tank	Plastic	6ft x 6ft	1500 gal.	Yet to install		

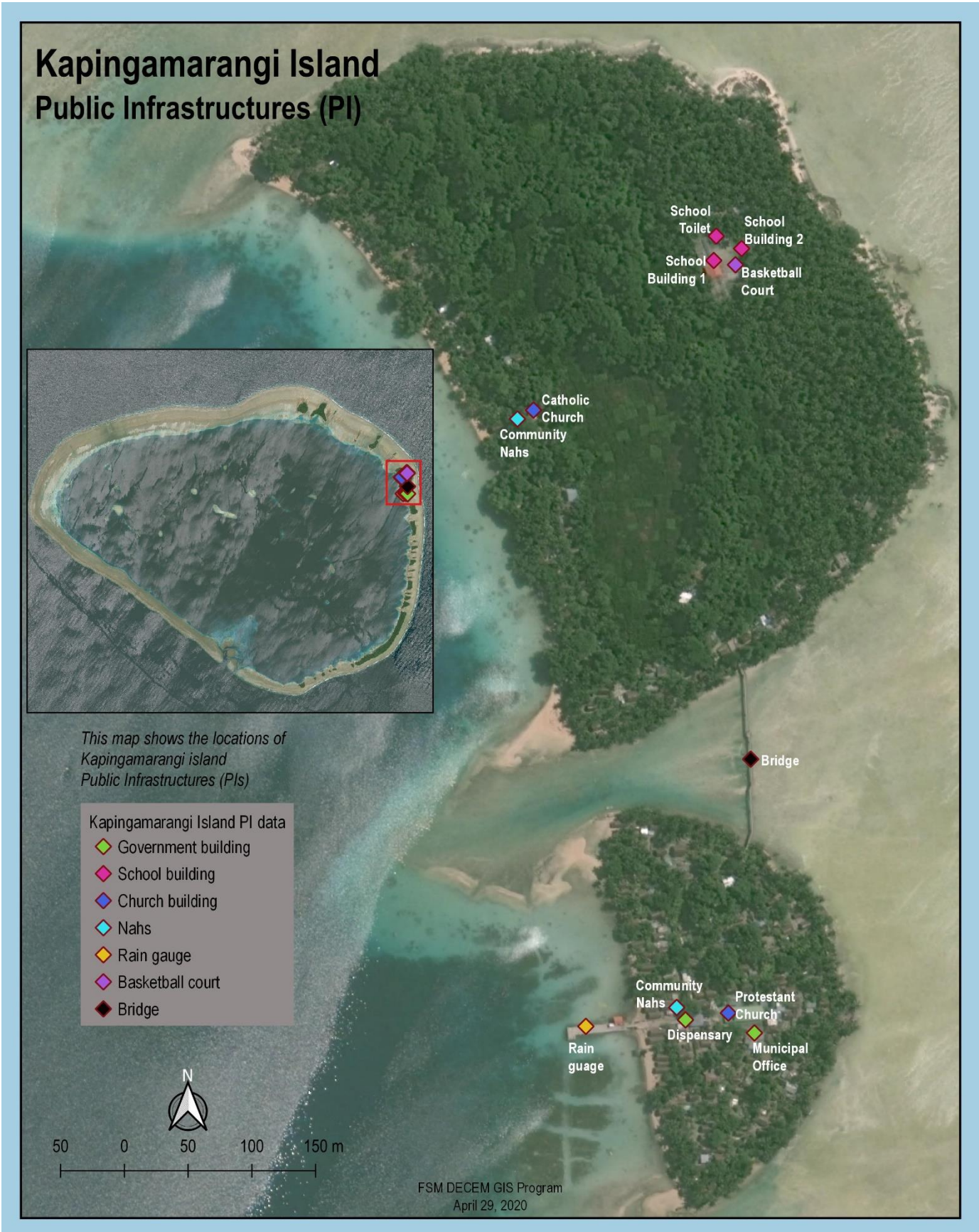
Map 1: Sapwuafik Island Public Infrastructures Map



Map 2: Nukuoro Island Public Infrastructures Map



Map 3: Kapingamarangi Island Public Infrastructures Map



Map 4: Nukuoro AF Project Sites



Map 5: Kapingamarangi AF Project Sites

