



ASSET MANAGEMENT- Water Stewardship in a changing climate

Water Authority of Fiji

November 29, 2022



Our Vision

Clean Water and Sanitation
for a Better Life

CONTENT

- BACKGROUND-WATER AUTHORITY OF FIJI



Our Mission

We are committed to optimising water and wastewater services through:

- Resilience
- Innovation
- Safe Working Practices
- Engaging Stakeholders
- Capacity Building
- Being Environmentally Focussed
- Modernization

- GIS @ WAF



- DASHBOARD



Our Values

- W** - we do the right thing.
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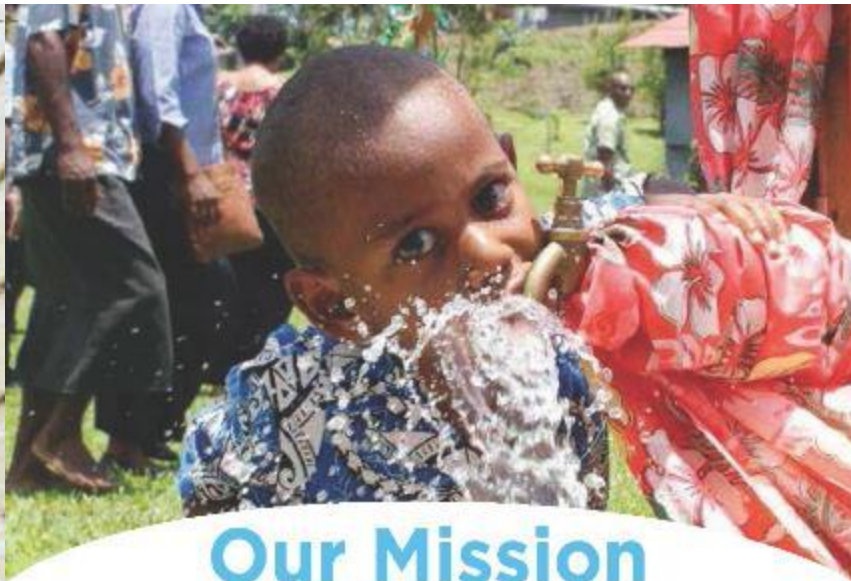
- Rainfall Predictions- Climate Model





Our Vision

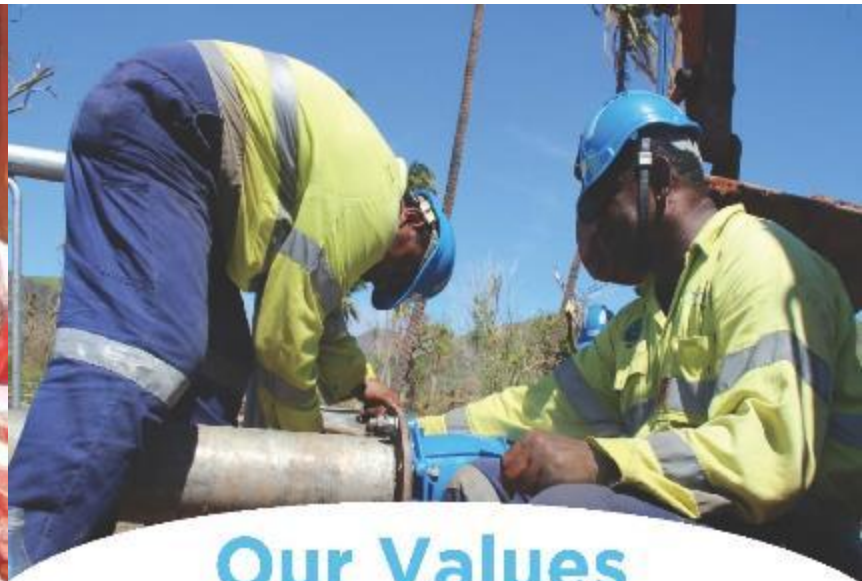
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Clean Water & Sanitation for a Better Life



Every drop is precious!



Clean Water & Sanitation for a Better Life



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Our Key Facts

About us

We operate under a range of legislative and regulatory instruments, including:

- Water Authority of Fiji Act 2007
- Constitution 2013
- Land Transfer Act 1971
- Environment Management Act 2005
- Financial Management Act 2004
- Finance Instructions 2010
- Employment Relations Act 2007
- Accident Compensation Act 2017
- Health and Safety At Work Act 1996

Our Coverage:

Water

- National - 82%
- Urban - 98% - 484,367 Population
- Rural - 58% - 214,903 Population

Wastewater

- Urban - 28% - 127,881 Population



154,898

Number of Water Connections



50

Water Treatment Plants



70

Water Source



132

Reservoirs



4203.22

Water Distribution Length (km)



33,273

Number of wastewater connections



11

Wastewater Treatment Plant



185

Wastewater Pumpstation



835.67

Wastewater Distribution Length (km)



36

WAF Depots



Clean Water & Sanitation for a Better Life



Key facts

Provided water and wastewater services to more than **881,832** customers

Approximately Delivered **134,081** mega litres of drinking water

Approximately Treated **21,883** mega litres of wastewater

WAF PRIORITIES



Our Vision

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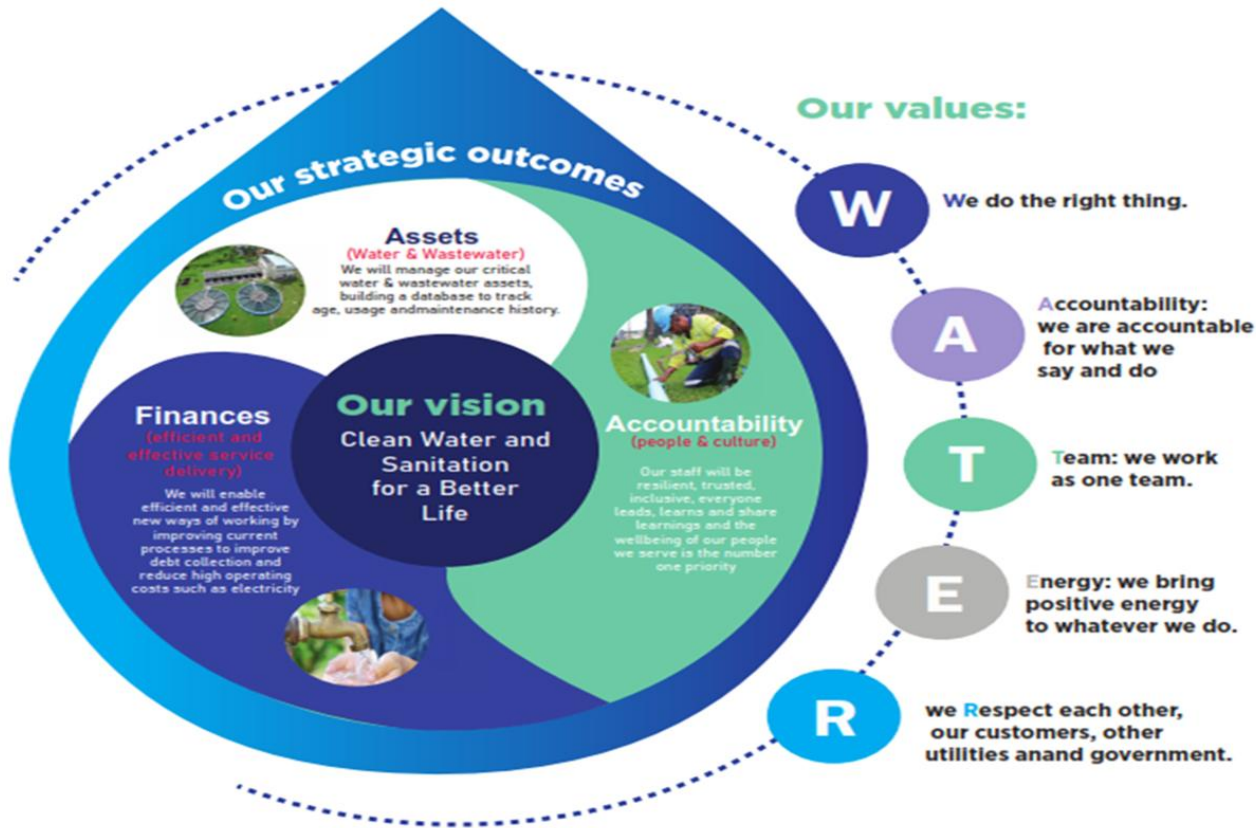
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Our focus areas:

- Non-revenue Water
- Water Sector 2050
- Digital Transformation (Automation)
- Asset Management
- Catchment Management
- Core Skill Development
- Capital Project Delivery
- Financial Sustainability & Efficiency



WAF- DATA ACQUISITION PROCESS



Our Vision

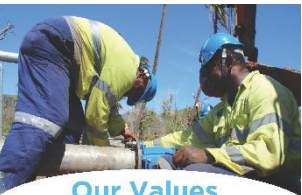
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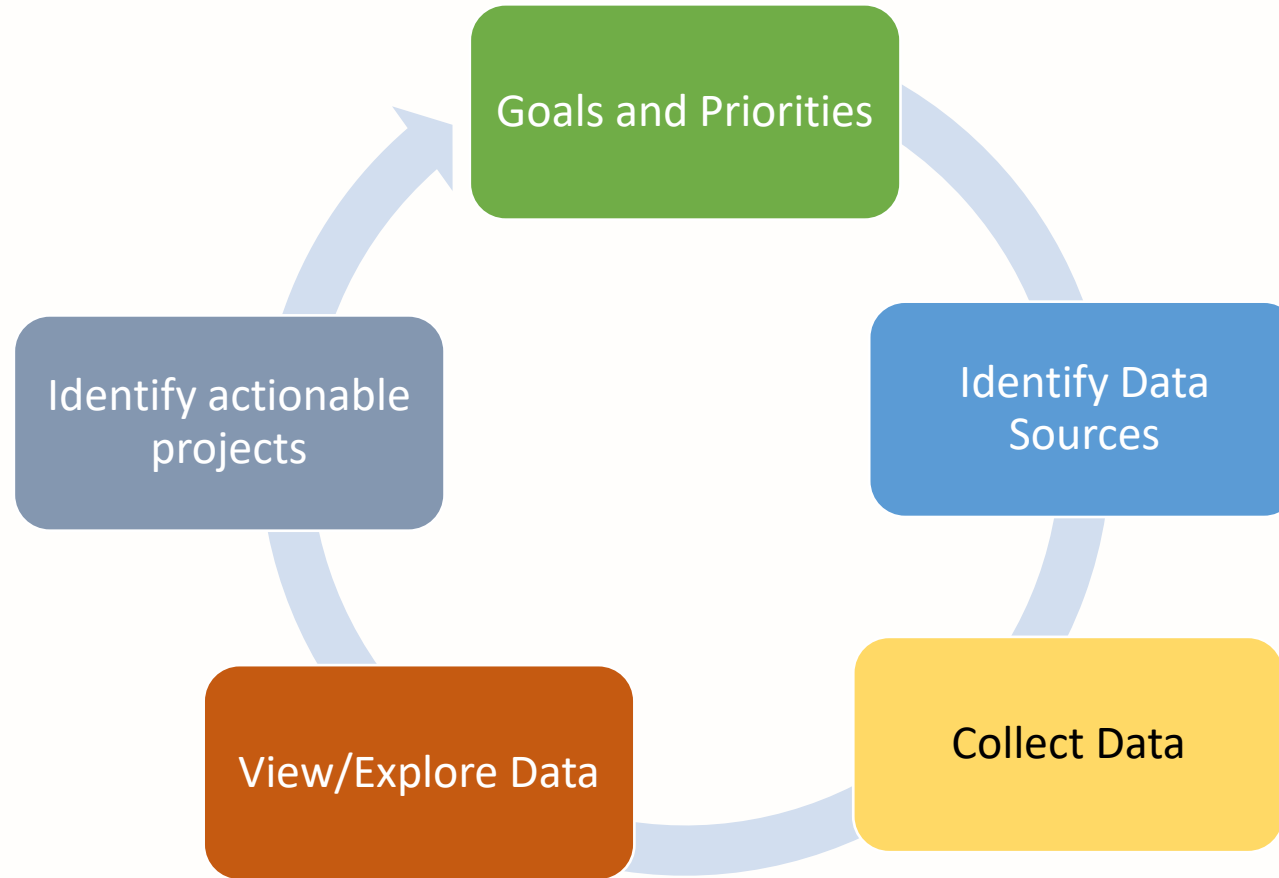
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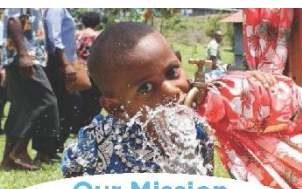
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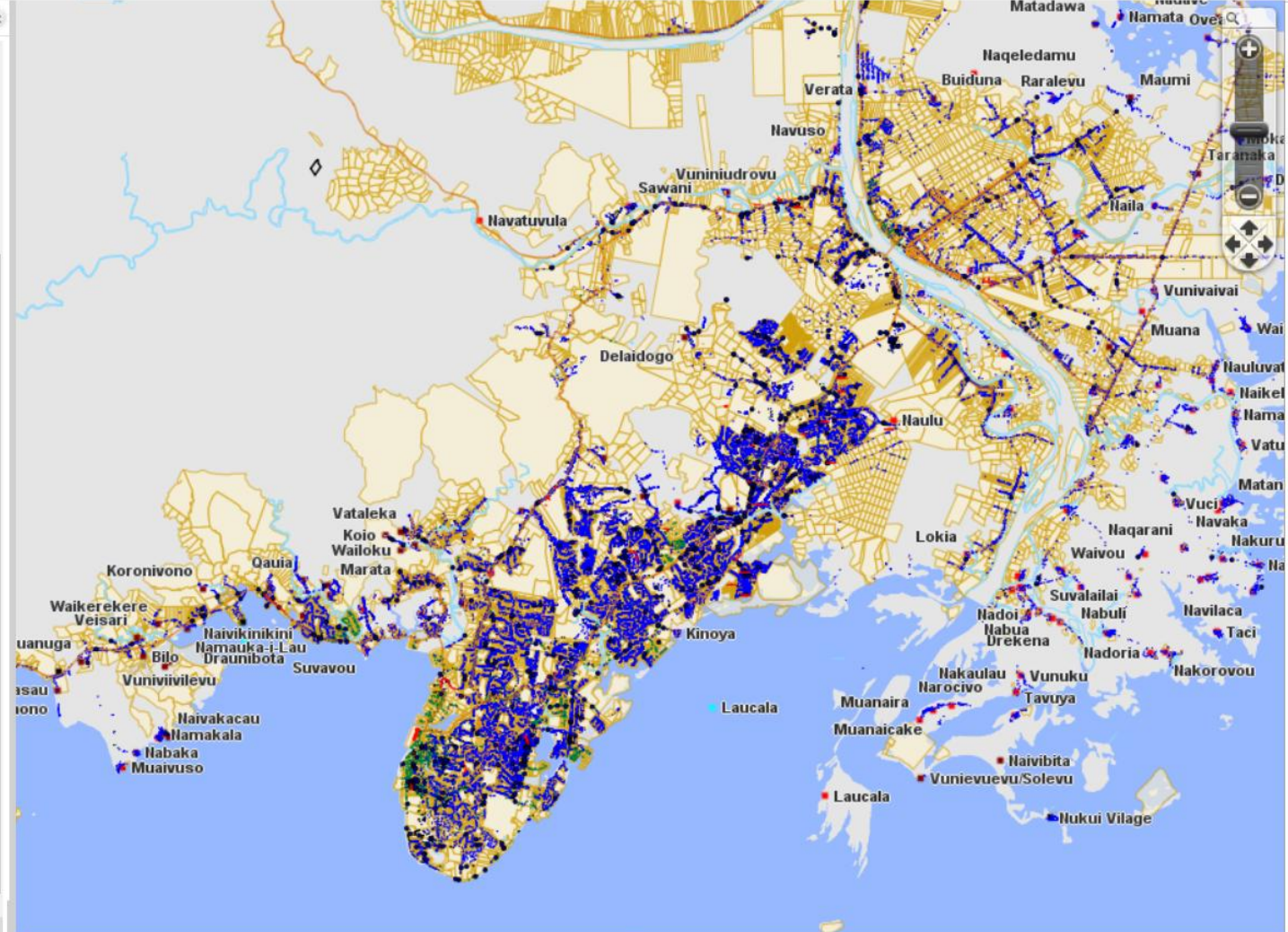


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- Layers
- Domestic
 - Government
 - Other/Not linked
 - Water Cart Area
 - Water supply district
 - District Meter Area
 - 15A15B
 - ...
 - Intermittent Area
 - Water meter cycle
 - Meter zone
 - Reservoir zone
 - Water Maintenance Zone
 - Water Verification Grids
 - WASTE WATER
 - BASE LAYERS
 - Place point
 - Village
 - Bay
 - Settlement
 - Other
 - FWP upgrade
 - BaseData
 - Suva City
 - ...
 - Bridges
 - River
 - VILLAGE RESTORE STATUS
 - Cadastre
 - Town boundary
 - Ba Town
 - ...
 - Catchments
 - Island Name
 - Coastline



Welcome ferlisa

Latest News

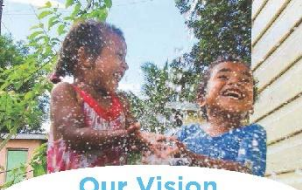
Welcome to Enlighten 4.1.11

Quick Links

- Viti Levu and Ovalau
- BA
- Deuba
- Keiyasi
- Korovou
- Lautoka
- Levuka (Ovalau)
- Naboro
- Nadi
- Nausori
- Navua
- QVS
- Rakiraki
- RKS

Enlighten Help

- enlighten user guide
- enCapture user guide
- What's new?
- Map view help
- Browser configuration guide
- Support
- License Agreement



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WAF BAVADRA 11/10/2022
Scale: 1 : 1515

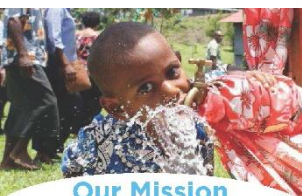


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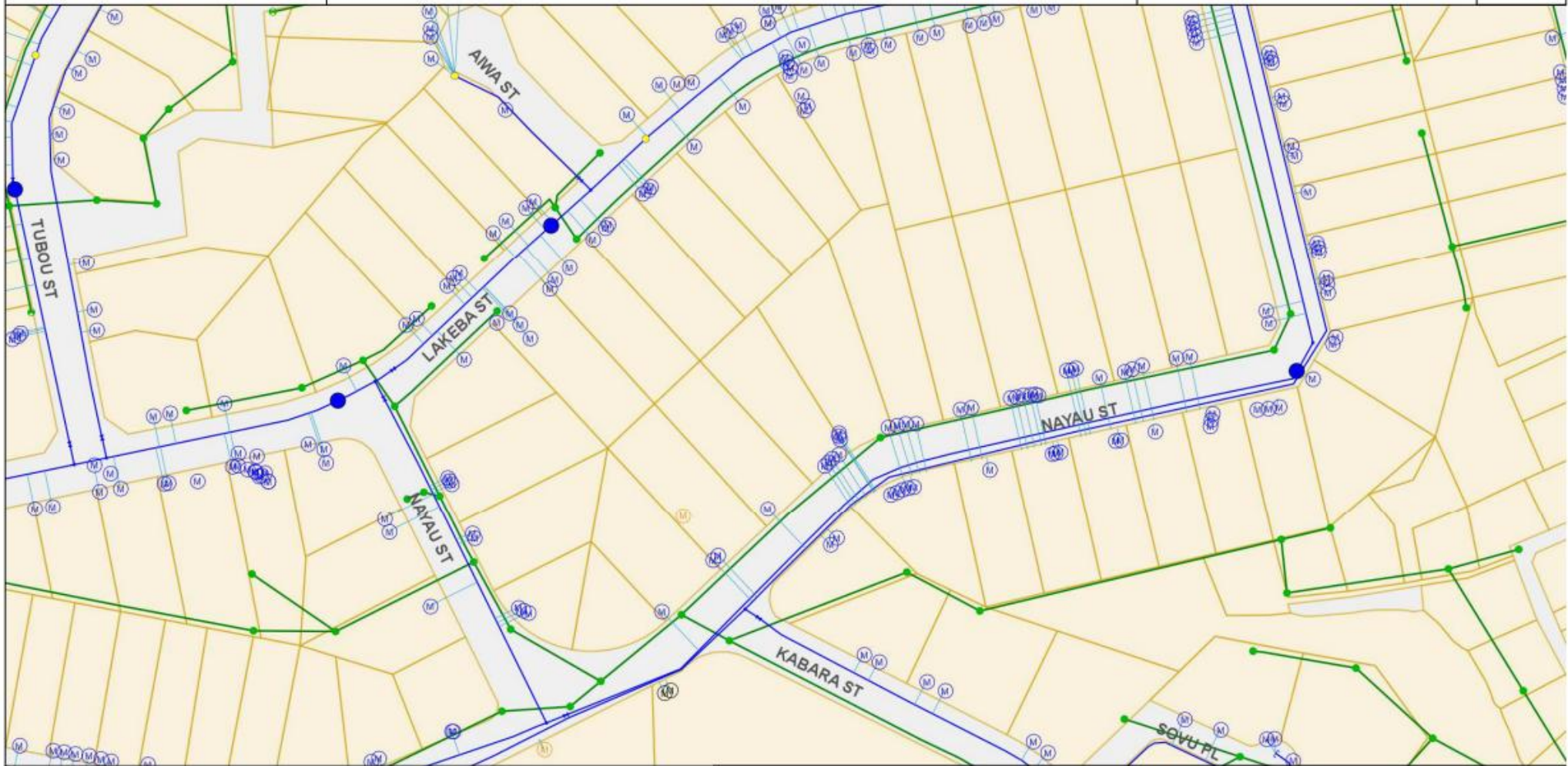
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LEGEND

	Scour Valve		Fire Hydrant		Waste Water Manhole		End Cap
	Air Valve		Water Junction		Scour Valve		Waste Water Junction
	Gate Valve		End Cap		Air Valve		Inspection Shaft
	Butterfly Valve		Water Pump Station		Closed Valve		Private Waste Water Pump Station
	Water Non Return Valve		Standpipe		Open Valve		Waste Water Pump Station
	Water Press. Reduction Valve		Water Tank / Tower		Cathodic Protection		Borehole
	Reducer		Water Reservoir		Retic Waste Water Main		Trunk Waste Water Main
	Retic Water Main		Trunk Water Main		Reuse Water Main		Decommissioned Waste Water Main
	Private Water Main		Decommissioned Water Main		Rising Waste Water Main		Property Waste Water Connection
	Property Water Connection		Raw Water Main		Private Waste Water Main		



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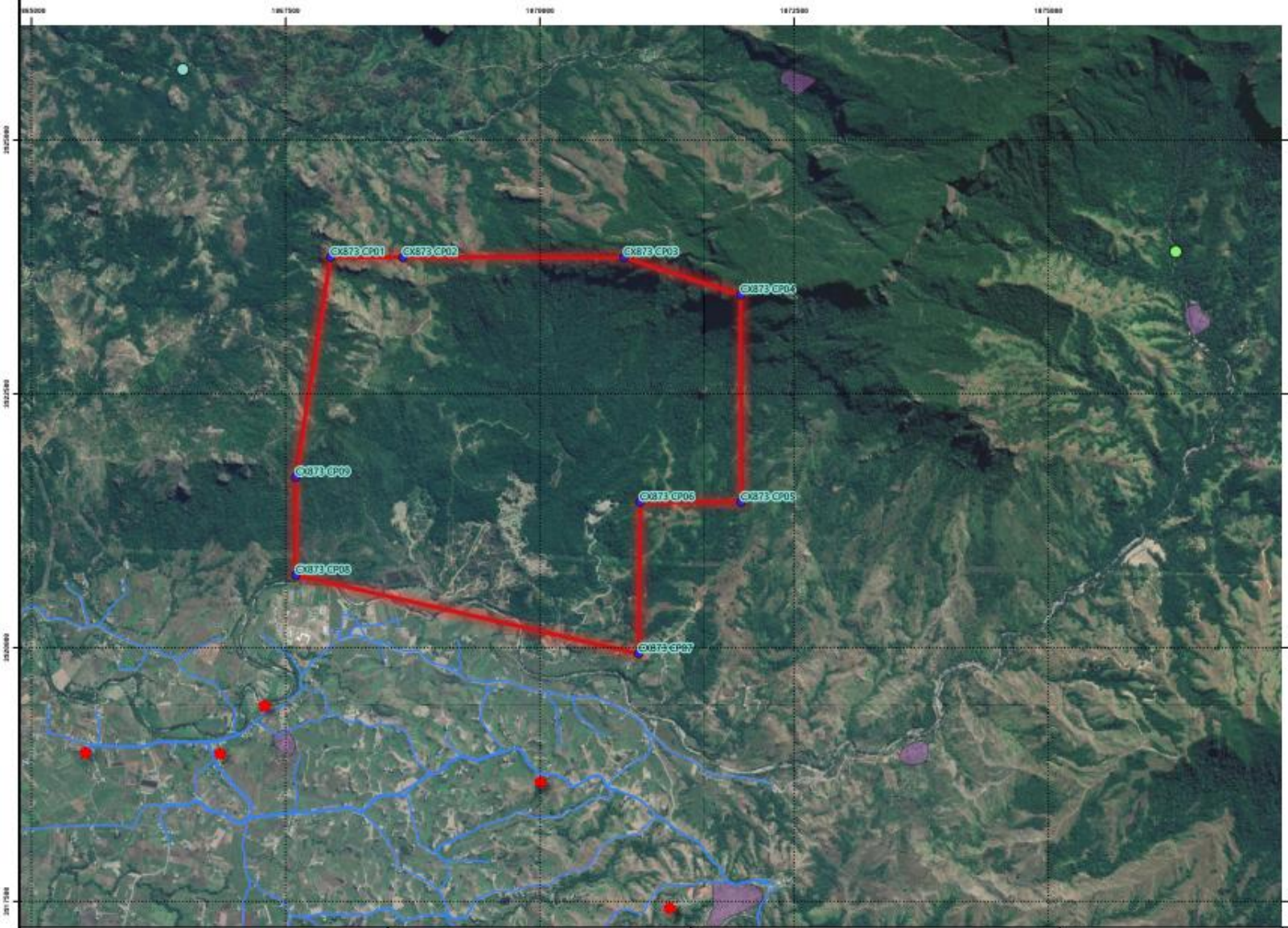


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LOCALITY MAP OF CX873



Legend

- Locality for CX873
- Proposed Water Source
- Operational Water Source
- ★ Primary Schools
- CX873
- waterpipes
- Villages

Background Source - Google Satellite



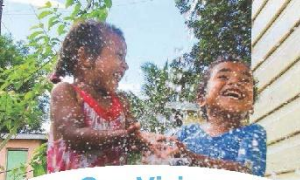
Water Authority of Fiji
 Wainivula Road, Nasinu, Republic of Fiji | GPO Box 1272, Suva, Republic of Fiji
 Telephone: (679) 3346777 or 5777 (Vodafone & Inkk) users | Email: contact@waf.com.fj
 Website: www.waterauthority.com.fj

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Notes :

Compiled by: WAF GIS	Date: 30/08/2022
Scale: 1:40000	Sheet no:





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Water Pipe Network Trace

Water Pipe Trace Results

Started: 11/10/2022, 4:43:42 PM
 Trace: Full
 Predicate: None
 Traced: 11/10/2022, 4:43:46 PM
 Finished: 11/10/2022, 4:43:57 PM
 Trace Id: 39827

Valves Affected (2)
 Pipes Affected (28)
 Parcels Affected (96)
 Services Affected (104)

Add/Remove Parcel/Service

Stop

Trace Through

[Show Report](#)
[Redraw Selections](#)

INTEGRATION BETWEEN SYSTEMS



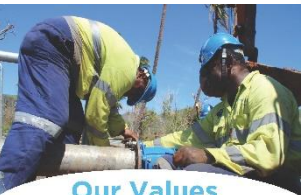
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Enlighten Reports - Personal - Microsoft Edge

Not secure | wafgismap/enlighten/Map_Manage/replInformation/Rep_All_Results.aspx?formid=1668054229122&traceNumber=&activeDetail=&width=1223&height=813

Advanced Form Reset

Map Layers
Water meter(1)

<input type="checkbox"/>	Existing Meter N...	<input checked="" type="checkbox"/> GID	<input checked="" type="checkbox"/> Sewered	<input checked="" type="checkbox"/> Pipe ID	<input checked="" type="checkbox"/> Parcel GID	<input checked="" type="checkbox"/> Reservoir Name	<input checked="" type="checkbox"/> Water Service C...
<input type="checkbox"/>	CH1212	486400	YES		1352972	Kashmir	KE

Water Meters | Accounts - PUBS | Usage - PUBS | Accounts - Gentrack | Usage - Gentrack

Code:		Comments:	
Data Source:	LTKA_MTR	Existing Meter Number:	CH1212
GID:	486400	MST_MT_DIST:	
New Meter Number:		Pics:	
Reservoir Name:	Kashmir	Route:	
Sewered:	YES	Water Service Connection GID:	
Pipe ID:		Parcel GID:	1352972
Tag X Coordinate:	1862601.9473684	Tag Y Coordinate:	3929499.09831887
DMA Name:	KERMODE_450	Zone Boundary:	KASHMIR_TAVAKUBU
Street Name:	UNKNOWN_05362		

X: 1862556.595140, Y: 3929429.112617 (Meter)

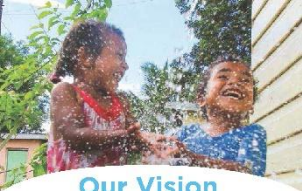
1 Water meter selected

1: 433.54

199.82 x 93.95 (m)

Powered by MapGuide

INTEGRATION BETWEEN SYSTEMS



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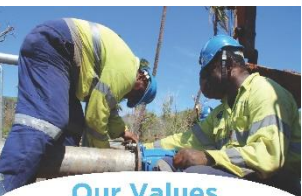
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Not secure | wfgismap/enlighten/Map_Manage/repInformation/Rep_All_Results.aspx?formid=1668054756984&traceNumber=&activeDetail=&width=1114...

Advanced Form [Reset](#)

Map Layers

Water pipe(1)

<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	GID	Pipe ID	Start Node	End Node	Geometry Le ...	Pipe Diameter	
<input type="checkbox"/>	1551027	163241	76535	74502	4.61424114048873	200	Poly Vi

Water pipes | PIPE_PIC | TEST | History log | Water Pipe Shutoff

Comments:	NADI_LAUTOKA	DATA_SOURCE:	L:\Western\Distribution\Map Info\Lautoka\L_Pi.TAI
End Node:	74502	Geometry Length:	4.61M
GID:	1551027	Acquisition Date:	02/09/1992
length:		Old Pipe ID:	P162
Pipe Diameter:	200	Pipe ID:	163241
Pipe Material:	Poly Vinyl Chloride (PVC)	Pipe Type:	Secondary Supply
Pressure:		Replacement Date:	
Reservoir:	KASHMIR	Start Node:	76535
Status:	Active	Water Category:	Potable Network
DMA Name:	KERMODE 450		

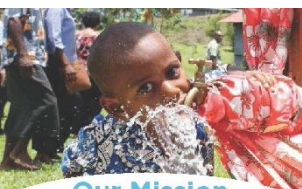


WAF- DATA COLLECTION TOOLS AND EQUIPMENT



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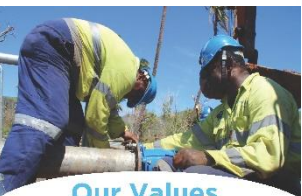
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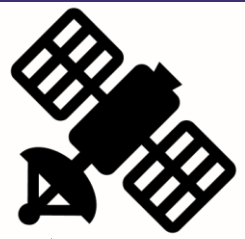
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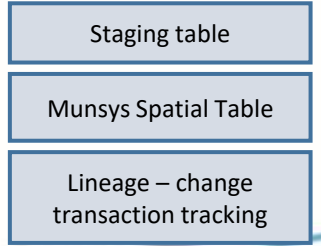
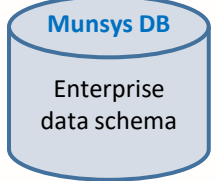
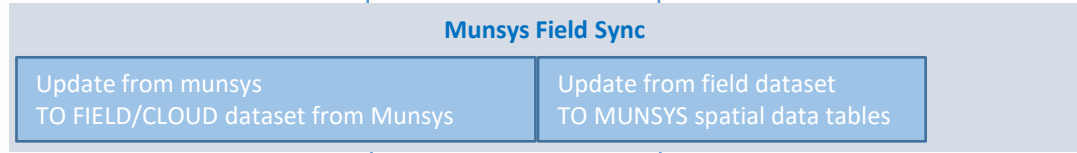


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Optional External GPS (Bluetooth)



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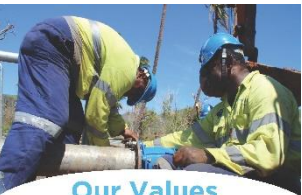
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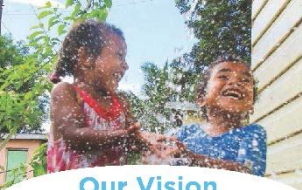


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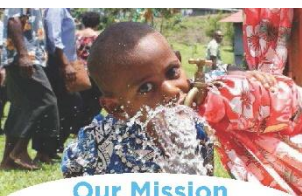


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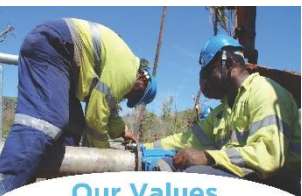
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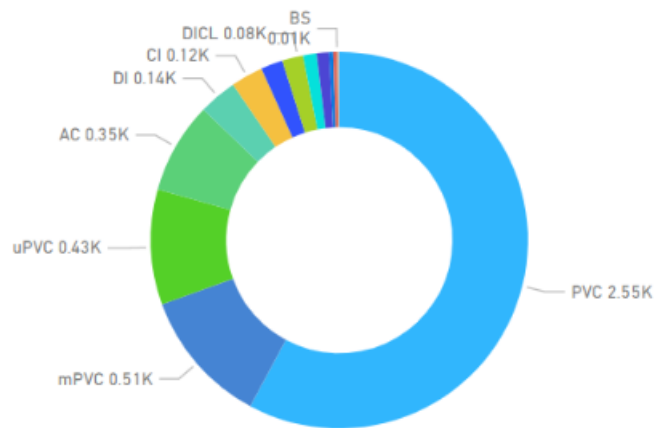


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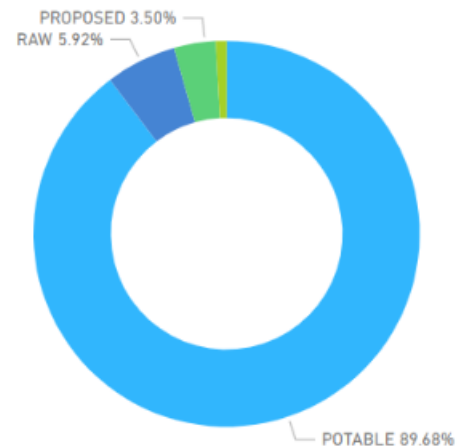
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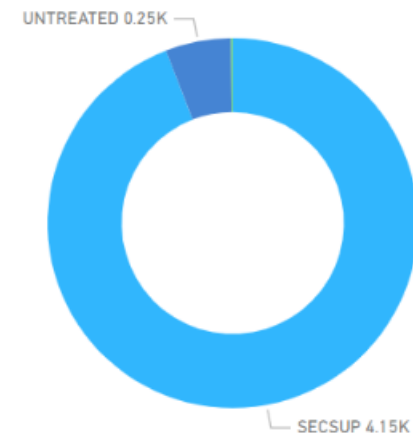
Pipe Length by Material



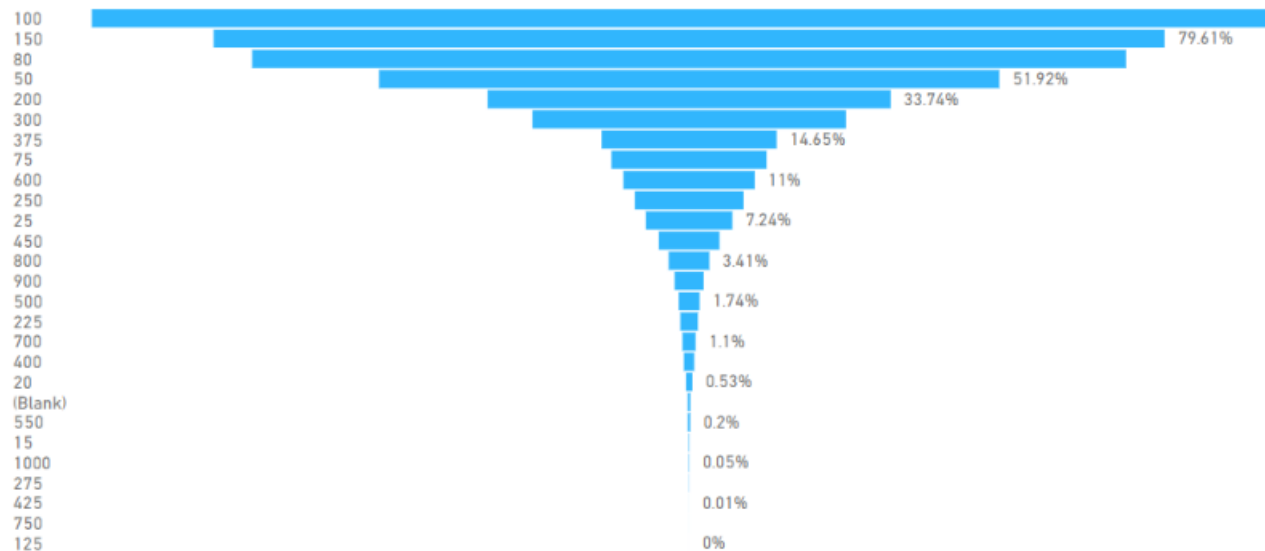
Pipe Length by Category



Pipe Length by Pipe Type



Pipe Length by Diameter

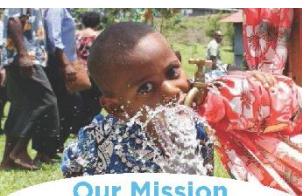


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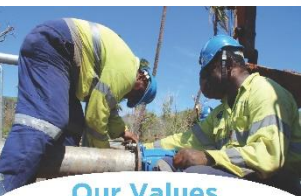
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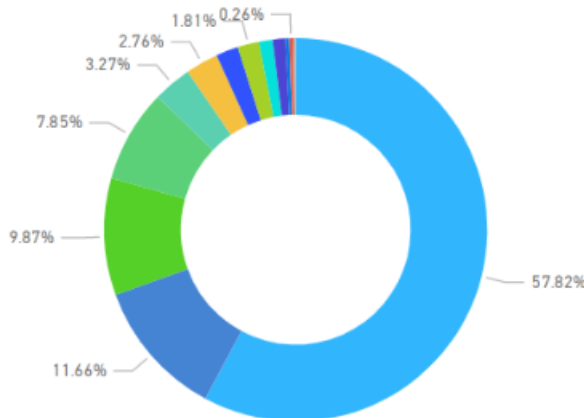
Pipe Length by Material and Diameter

PIPE_MATRL	0	100	1000	125	15	150	20	200	225	25	250	275	300	375	400	425	450	50	500	550	600	700	75	750	80	800	900	Total
PVC	2.18	630.95	0.37	0.01	0.36	555.33	0.38	148.50	3.20	4.77	18.50	0.28	45.35	39.17			1.96	386.72	4.99		0.13		110.64	592.96	0.14			2,546.89
mPVC		172.62				107.81		98.46			20.62		42.98	59.32			4.65	0.50	2.20				0.43		3.85			513.44
uPVC		96.59				53.72		33.19	0.57	0.09	14.60		36.98	10.99				72.27	0.11				0.52		115.02			434.64
AC		65.65				43.59	0.10	42.37	2.93	0.29	31.23		46.19	7.22			10.72	55.56			7.34		15.01		17.53			345.74
DI		6.33				2.91		0.21			1.98		40.61	11.51			14.08		8.17		56.96	1.09		0.03	0.04	0.14	0.04	144.09
CI		19.72				25.11		12.04	6.12		3.62		29.79	11.49	0.03		1.95	1.72	0.01		1.52		4.44		3.78			121.35
POLY		5.11			0.29			4.87	5.09		63.62	0.74						1.61							1.59			82.91
DICL									0.03		0.38		10.59	7.85			12.07	0.20	2.09		19.91			0.26	26.20			79.59
STEEL		0.94	0.16			0.75		0.26	1.99		0.09		11.34	0.12	8.54		1.28	0.00	0.02	2.02		23.77	0.01		0.03			51.31
MSCL								0.02					0.48				2.57				1.28	9.97			7.87	24.45		46.63
GALV		4.10				4.51		0.01	0.03				0.05	0.03		0.06		3.60							2.17	0.03		14.60
HDPE		3.64				0.06				4.23			0.26		0.14		1.94	0.98							0.42			11.26
BS		0.34				5.52												0.37										6.65
AS		2.32				3.38																						5.70
Total	2.18	1,008.30	0.52	0.01	0.64	802.69	5.35	340.19	14.84	73.01	91.74	0.28	264.63	147.70	8.71	0.06	51.22	523.53	17.59	2.02	110.91	11.07	131.04	0.03	737.65	34.39	24.49	4,404.78

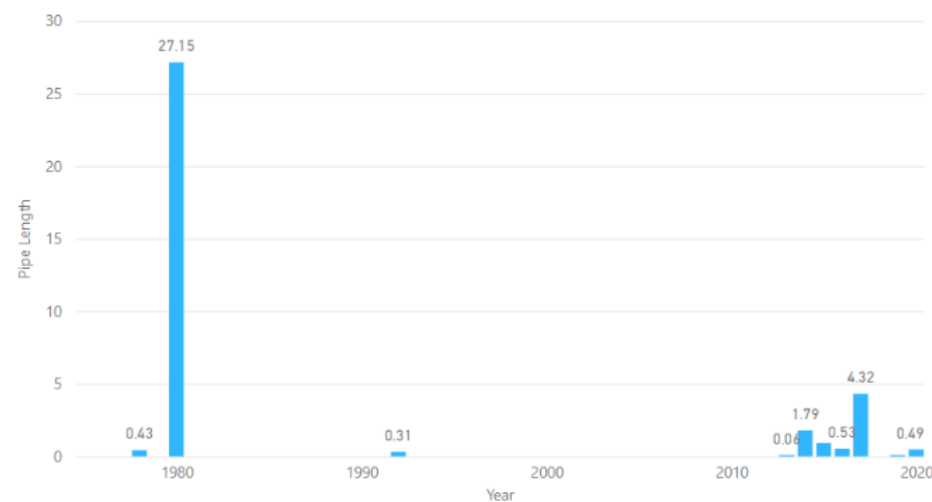
Pipe Length by Diameter

Pipe Material

- Poly Vinyl Chloride (PVC)
- mPVC
- uPVC
- Asbestos Cement
- DI
- Cast Iron
- Poly
- Ductile Iron Concrete Lined (DI...)
- Steel
- Mild Steel Cement Lined (MSCL)
- Galvanised Steel
- High Density Poly Ethylene (HD...)
- British Standard
- Asbestos



Pipe Replacement Year (km)



Rainfall predictions- representative concentration pathway 6.0



Our Vision

Clean Water and Sanitation for a Better Life



Our Mission

- We are committed to optimising water and wastewater services through:
- Resilience
 - Innovation
 - Safe Working Practices
 - Engaging Stakeholders
 - Capacity Building
 - Being Environmentally Focused
 - Modernization



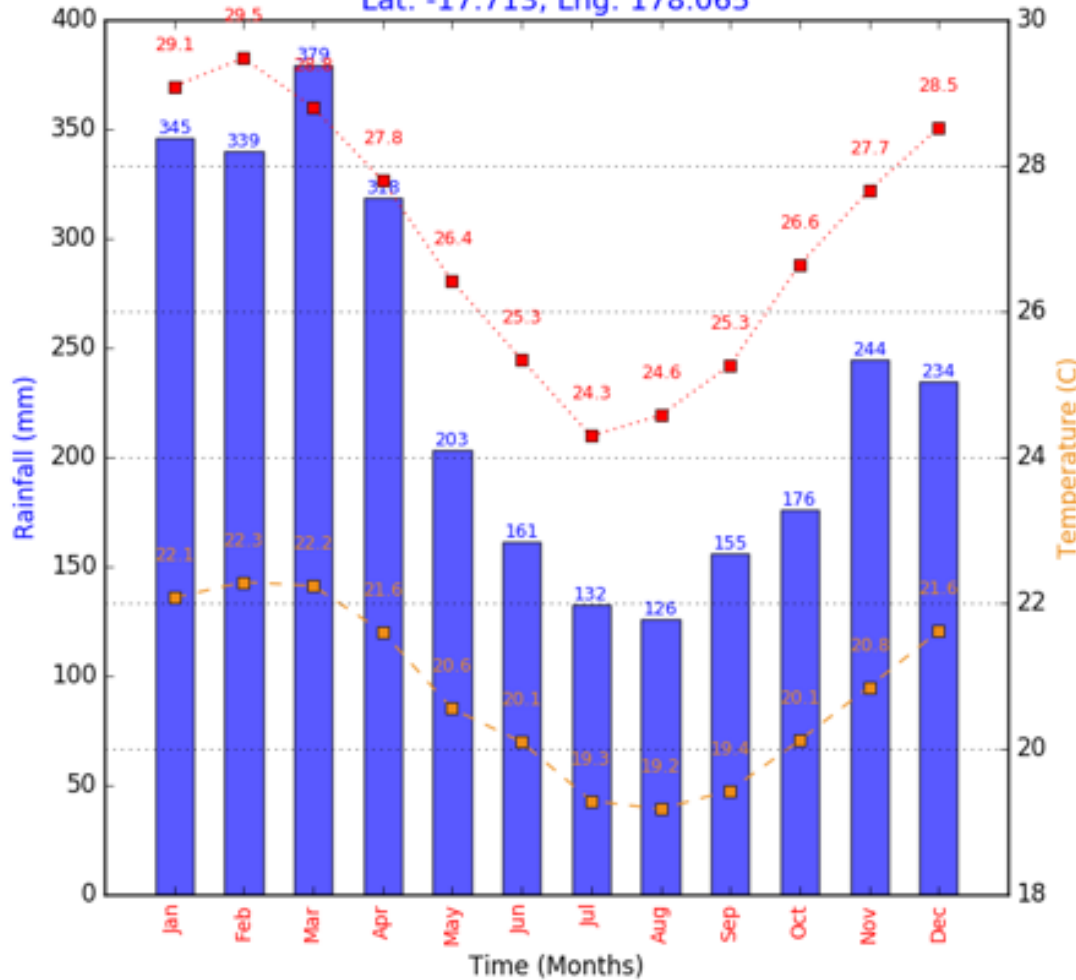
Our Values

- W** - we do the right thing.
- A** - accountability: we are accountable for what we say and do.
- T** - team: we work as one team.
- E** - energy: we bring positive energy to wherever we go.
- R** - we respect each other, our customers, other utilities and government.



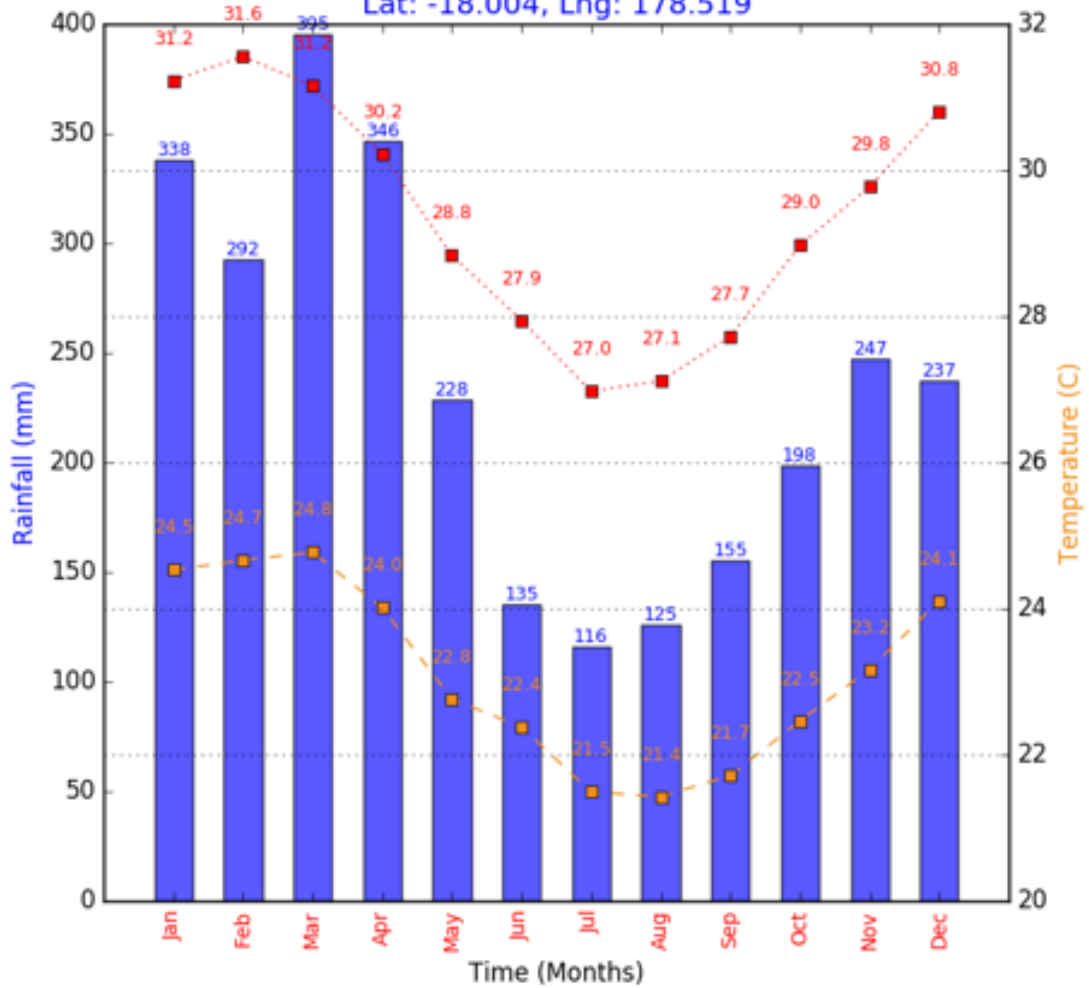
2050- rcp 6.0

Lat: -17.713, Lng: 178.065



2075- rcp 6.0

Lat: -18.004, Lng: 178.519



Rainfall predictions- representative concentration pathway 8.5



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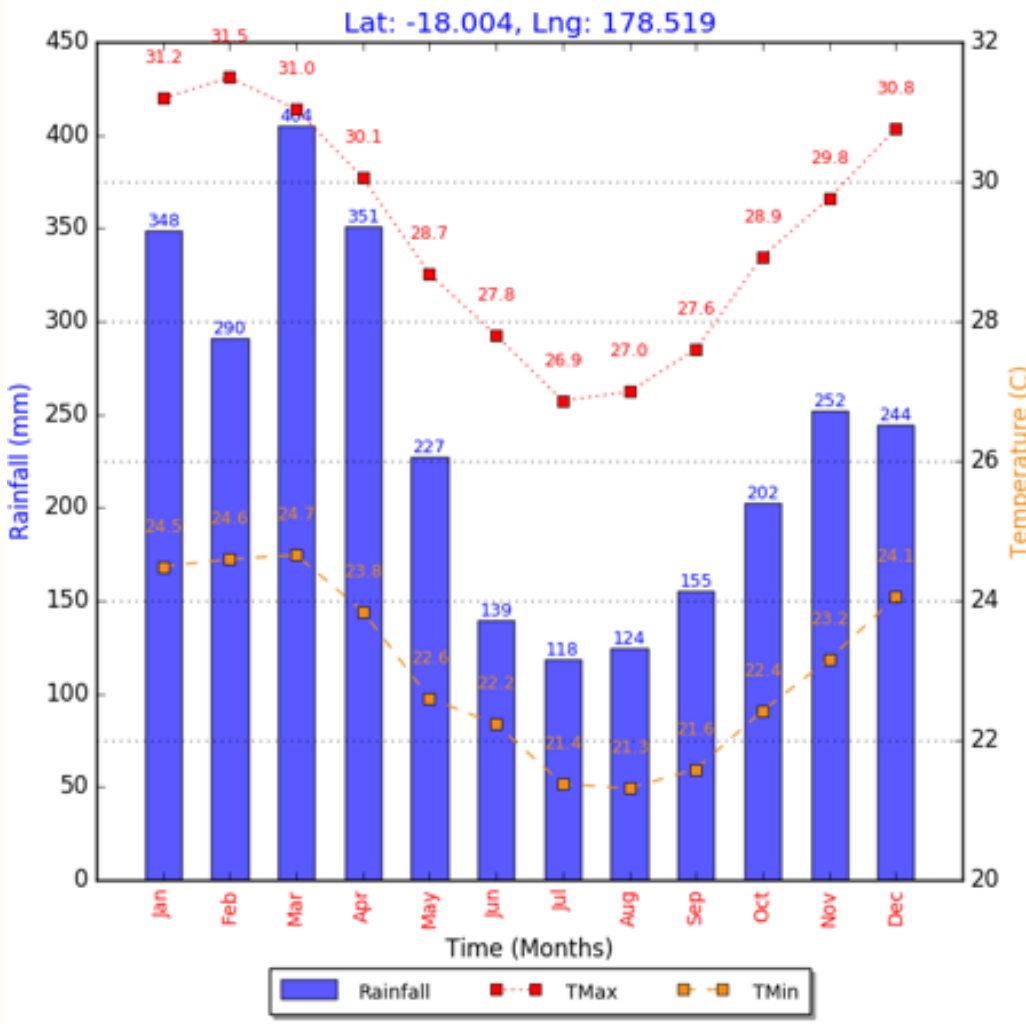


Our Values

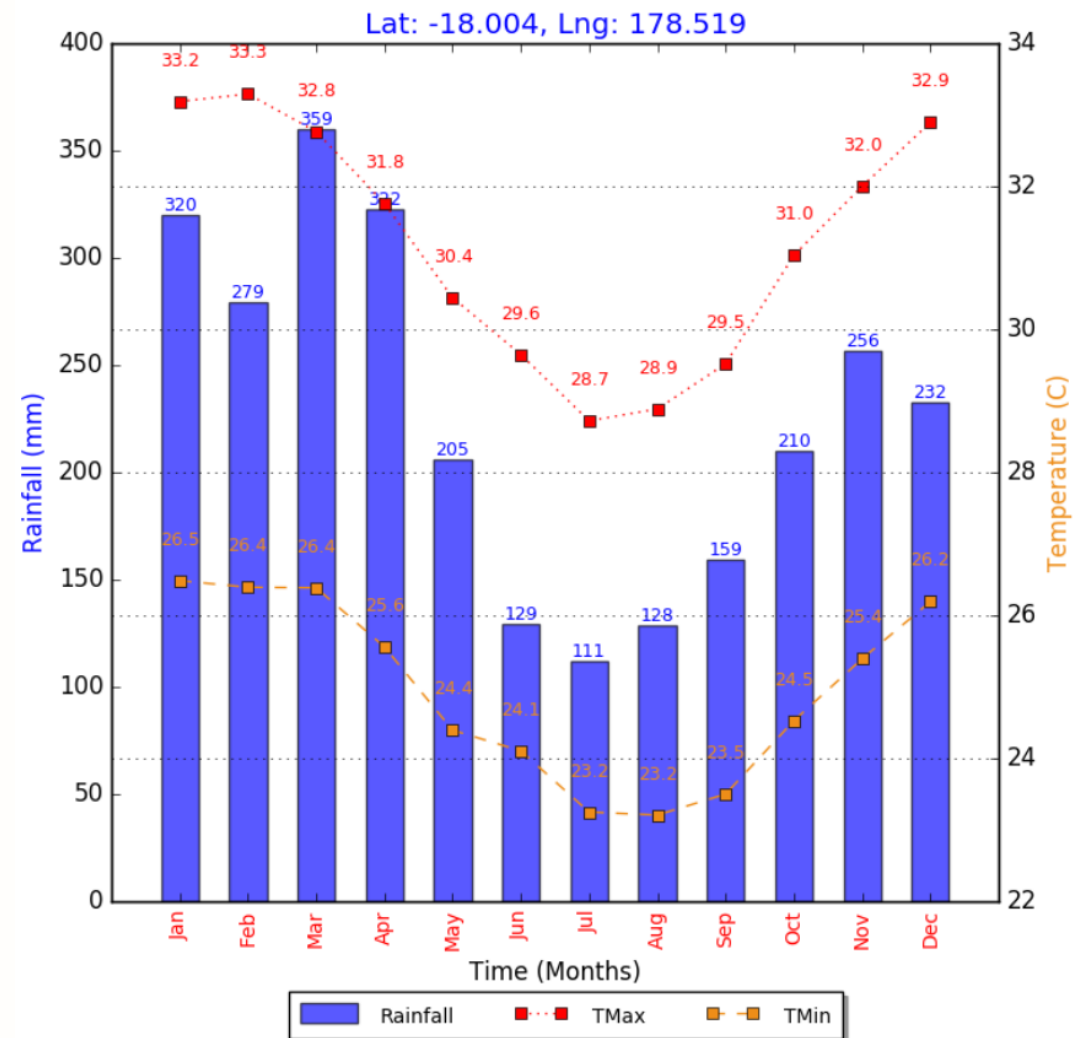
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2050- rcp 8.5



2075- rcp 8.5





Our Vision

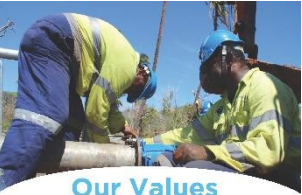
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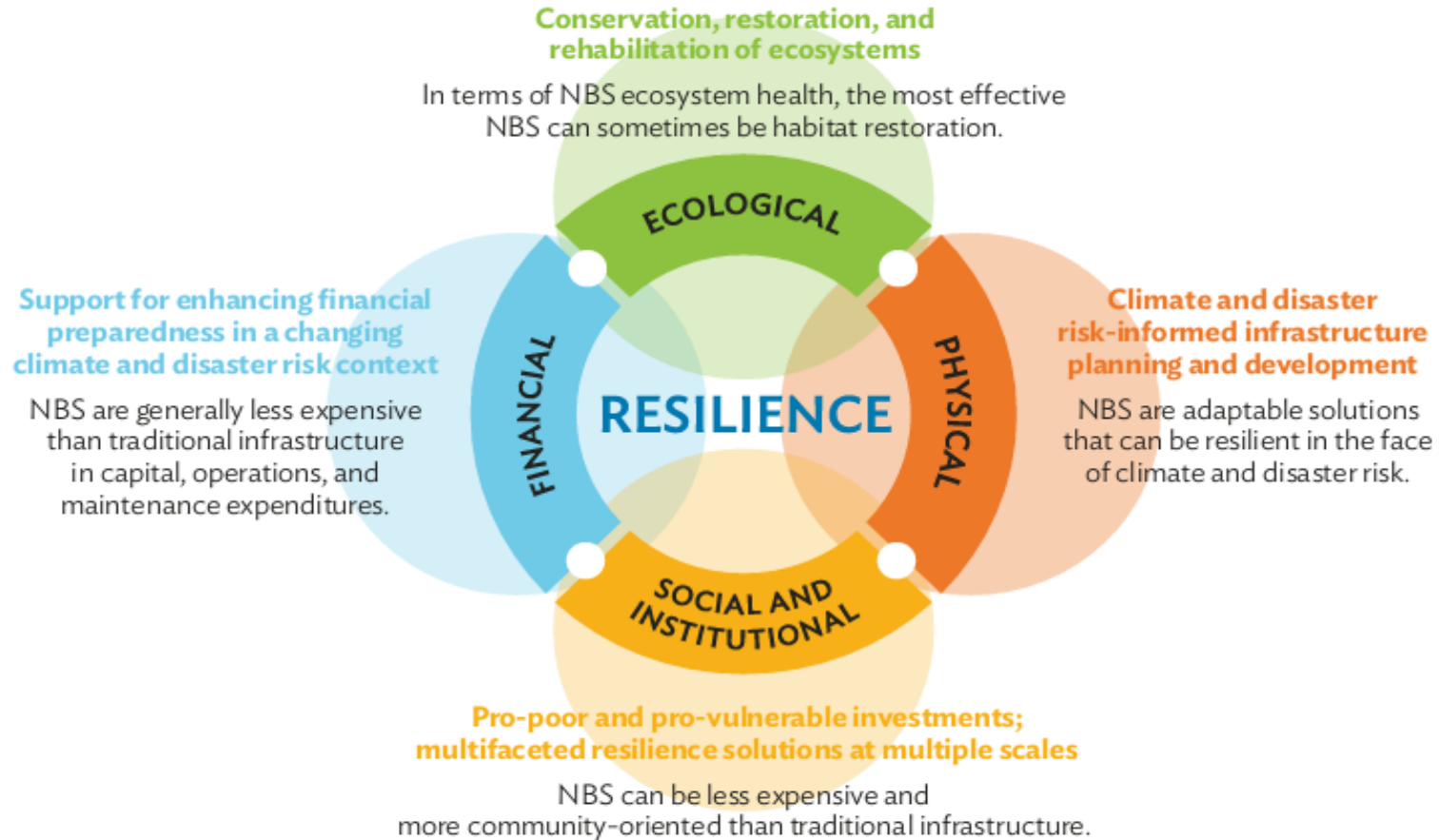


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Figure 1: Dimensions of Holistic Resilience and Contributions of Nature-Based Solutions to the Resilience Dimensions



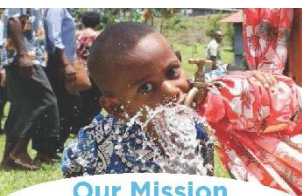
NBS = nature-based solutions.

Source: Adapted from X. Lu. 2019. Building Resilient Infrastructure for the Future: Background Paper for the G20 Climate Sustainability Working Group. *ADB Sustainable Development Working Paper Series*. No. 61. Manila: Asian Development Bank.



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LESSONS LEARNED



1. Important to collect “Age” of assets.
2. Connect with other systems, record condition,
3. Reconciliation between systems.
4. Data Collection takes time and Organizational commitment.
5. Accuracy- dependent on time and money.

Upcoming Projects: Correlations between Soil Definitions and Pipe fragility.





VINAKA !

