

⑤ From Okinawa to Fiji



Mr. Vishwa Jeet from Fiji asked me many questions during the JICA training at Miyako Island in Aug. 2011.

Hungry is Normal.

Contents:

① Introduction : EPS

② Quest for Pure Water : Food Chain is key.

③ Chemical free URF and EPS.

④ From Miyako Island to Samoa

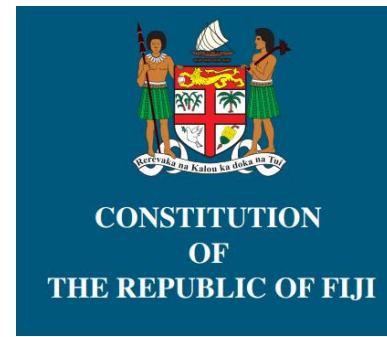
⑤ From Okinawa to Fiji

⑥ EPS as Social Contribution

⑦ EPS trial in Malaysia and Guyana

⑧ EPS in Sri Lanka and Pakistan

⑨ EPS: Trust Our Sense



EPS 2026-OBW
Part ⑤:1-20 20 slides

New Constitution of Fiji
shall come on 7
September 2013.
p24, No.36.

36. Right to adequate food and water

Right to adequate food and water

36.—(1) The State must take reasonable measures within its available resources to achieve the progressive realisation of the right of every person to be free from hunger, to have adequate food of acceptable quality and to clean and safe water in adequate quantities.

Fijian people made a big effort for the people.

Mr. Vishwa Jeet remember these words.



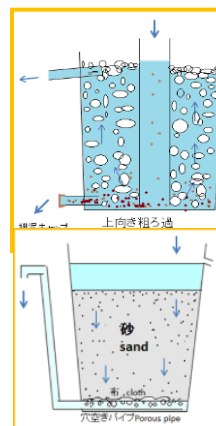
Remember Three Steps

1. Knowing is NOT enough. We must APPLY it to something useful.
2. Willingness is NOT enough. We must PUT it into the PLAN and ACTION.
3. Putting the PLAN into action is NOT enough. We must ACCOMPLISH the goals.

JICA Training at Okinawa, in August, 2011



Mr. Vishwa Jeet from Fiji gave many questions to me.



He returned back to Fiji. He made a model to make safe drinking water by EPS technology at the yard of Department of Sewage and Water. Water source was rain harvest tank.



The PM had attention for EPS display during the World Marine Time Day on **Sept. 28, 2012**. Our Director informed the PM on the functions of the EPS and reference to JICA was made.

Kick off Workshop on Jan. 16. 2013. at Holiday Inn. Commander Francis B. Kean, Permanent Secretary, Ministry of Works, Transport, Public Utilities.

Holiday Inn: Jan.16.2013



<https://www.youtube.com/watch?v=wxAGhjx7e40>

1:45



The Fiji Times ONLINE

Quality water for all

Priya Chand
Thursday, January 17, 2013

WITH the new Ecological Purification System (EPS) in the pipeline, water quality enjoyed by urban people can now also be made available in rural villages and communities.

A workshop on a new water treatment system, hosted by the Department for Water and in collaboration with the Japan International Cooperation Agency (JICA) in Suva yesterday, revealed that EPS was an economical and ecological way of purifying water.

Works permanent secretary Commander Francis Kean said the vision to provide safe adequate water and efficient sanitation to the whole population in Fiji was in government's roadmap.

"About 70 per cent of our rural population drink water directly from creeks and river sources which are most



Water treatment expert Dr. Nakamoto Nobutada speaking at the Holiday Inn.
Picture: ELIKI NUKUTABU



Jan. 17. 2013.
Dept. Sewage and Water



Rain harvest tank of 2.7 tons for this project.



*EPS technology is our technology for ours.
We can make it by ourselves.*



KALOKOLEVU VILLAGERS WELCOME ACCESS TO CLEAN DRINKING WATER

7/17/2013

More than 270 villagers in Lami now have access to clean and safe drinking water through an ecological purification system (EPS), thanks to the partnership between the Department of Water and Sewerage, the Water Authority of Fiji (WAF) and the Japan International Cooperation Agency (JICA).

The EPS, which is the first of its kind to be installed in a local rural setting, was commissioned by the Ministry of Works, Transport and Public Utilities permanent secretary Commander Francis Kean in Kalokolevu village, Lami yesterday.

Commander Kean said the pilot project was aimed at improving accessibility to clean water and sanitation to people living in rural areas.

He said this is a major milestone for the country and the Government in particular in its desire to lift the living standards of people in the rural and maritime areas.

"Improving the living standards of the rural citizens through better accessibility to clean water and sanitation is one of the key priorities of this Government as enshrined in the Peoples Charter for Change, Peace and Progress and the Government Roadmap to Sustainable Development in the medium term," Commander Kean said.

Ecological
Purification
System in Fiji,
2013 for Safe
Drinking Water -
YouTube/ 3:05



<https://www.youtube.com/watch?v=kbCaSAACQZ0>



Beginning of
Ecological
Purification System
(EPS) to make safe
drinking water in
Fiji / 1:45



<https://www.youtube.com/watch?v=wxAGhjx7e40>



Clean, safe water brings joy to village



NAVATUVULA VILLAGERS GET ACCESS TO CLEAN DRINKING WATER

9/12/2013

Improving the living standards of the rural communities through better accessibility to safe drinking water and sanitation is one of the key priorities of the Fijian Government.

This was highlighted today by the Ministry for Works, Transport and Public Utilities permanent secretary, Mr Francis Kean at the commissioning of the second ecological water purification (EPS) at Navatuvula village in Sawani, Naitasiri.

The first EPS was commissioned at Kalokolevu village in Lami about two months ago.

Mr Kean said his ministry's aim is to install EPS into rural water supply systems to ensure removal of contaminants before water is consumed.

"The incorporation of the EPS into rural water projects will take place after further monitoring the results of the pilot projects by the Water Authority of Fiji (WAF)," Mr Kean added.

Villagers of Navatuvula, Naitasiri have a reason to smile, thanks to the governments of Fiji and Japan. From yesterday the villagers started drinking safe and clean water, commissioned by the Permanent Secretary for Works, Commander Francis Kean. The water is supplied through an ecological purification system (EPS) – similar to traditional mineral water production.

Quality Water for All :
Safe and Clean Water
Project in Fiji, 2013 -
YouTube/ 7:43



<https://www.youtube.com/watch?v=Vrr2EOS1PMA>



Water source

EPS was settled between the existing distribution pipes of non-treated water supply. A public tap system of water supply for germ free safe water was proposed.

Settling storage tank



Sediment heavy muddy matter



EPS can provide 6 liters per person of water for drink and cooking.



Tap in Village



Existing system in village

Non treated water

URF:
Up-flow
Roughing
Filter

EPS:
Ecological
Purification
System (natural
down flow)

Siphon
break

BALANCE Tank :
over-flow to keep
gentle flow for EPS

over-
flow

tap Public
tap

*Trap and reduce
muddy matter
by gravel tank*

*Complete
purification
by sand tank*

*Store the germ free,
safe and delicious
drinking water*

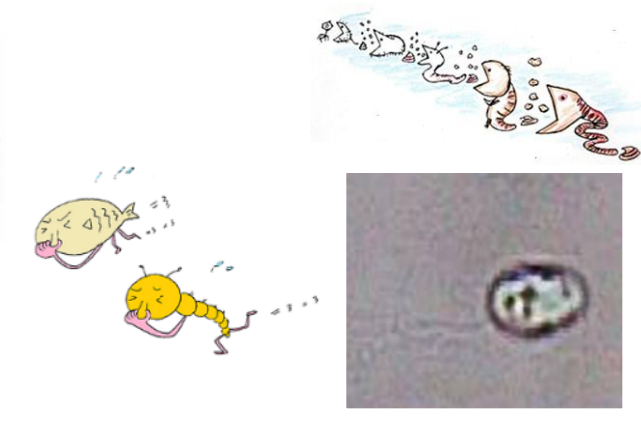
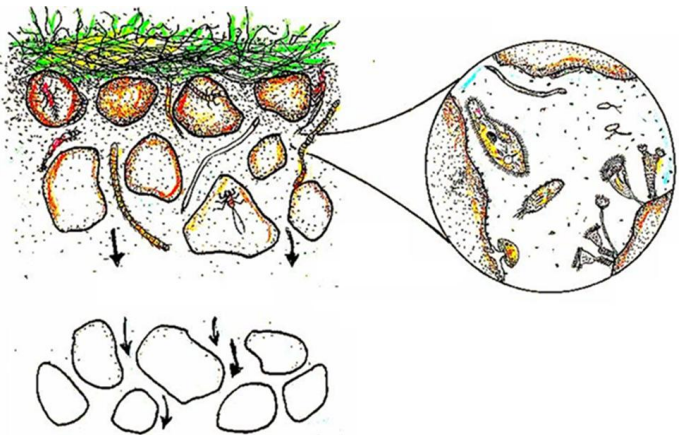
EPS (Ecological Purification System) for germ free drinking water



Look like dirty mud. There are so many microscopic organisms.



I showed microscopic organisms using portable microscope to villagers at the site.

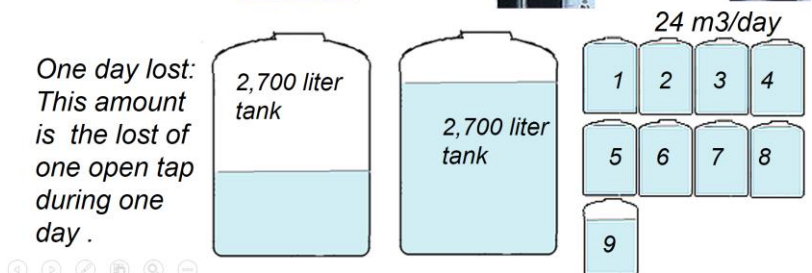
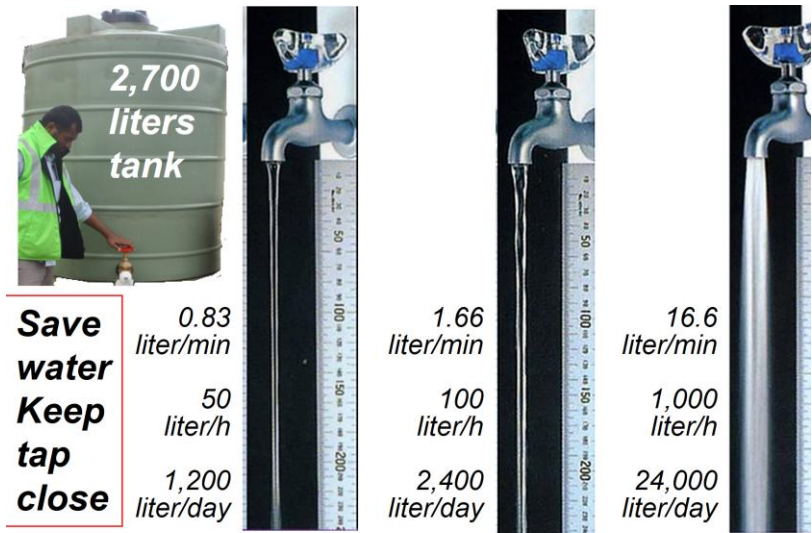




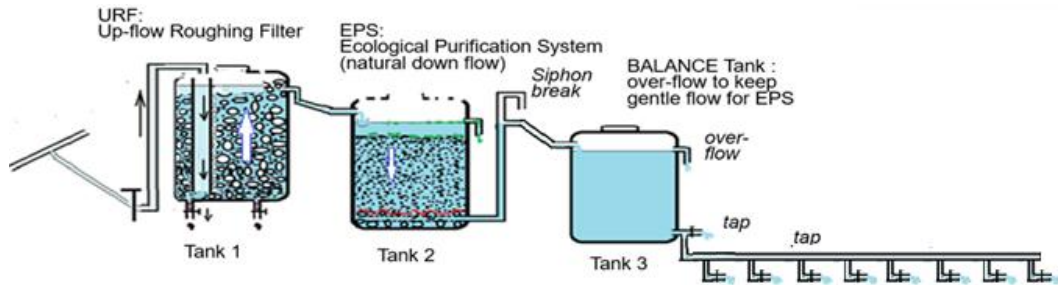
Comment on more use of EPS water in a village



EPS capacity of 2,700 liters tank									
radius (r) = 0.7m (π x r x r) =1.54m ²									
flow rate			filtrate			Available persons			remarks
m/d	cm/h	m3/d	liter/d	liter/h	liter/min	2 liter/d	6 liter/d	100 liter/d	
2	8	3.1	3,080	128	2.1	1,540	513	31	Original flow rate in UK, 1829
5	20	7.4	7,392	308	5.1	3,696	1,232	74	English standard rate
10	42	15.4	15,400	642	10.7	7,700	2,567	154	Present Thames Water rate
15	63	23.1	23,100	963	16.0	11,550	3,850	231	Possible rate in warm region
20	83	30.8	30,800	1,283	21.4	15,400	5,133	308	Possible rate in warm region

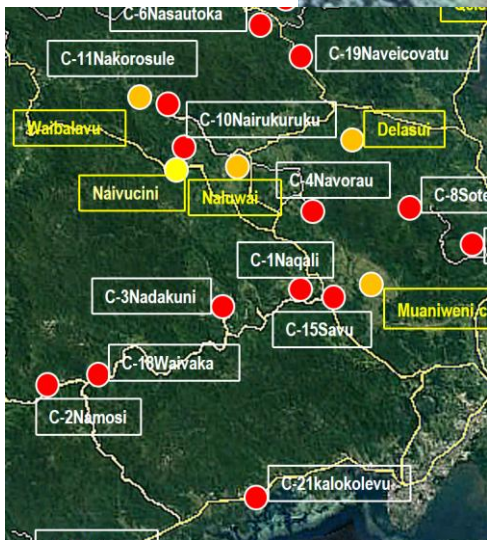


1. Block distribution system for EPS water is recommended.
2. Install more public taps for villagers.
3. Training for the save the limited amount of EPS water.

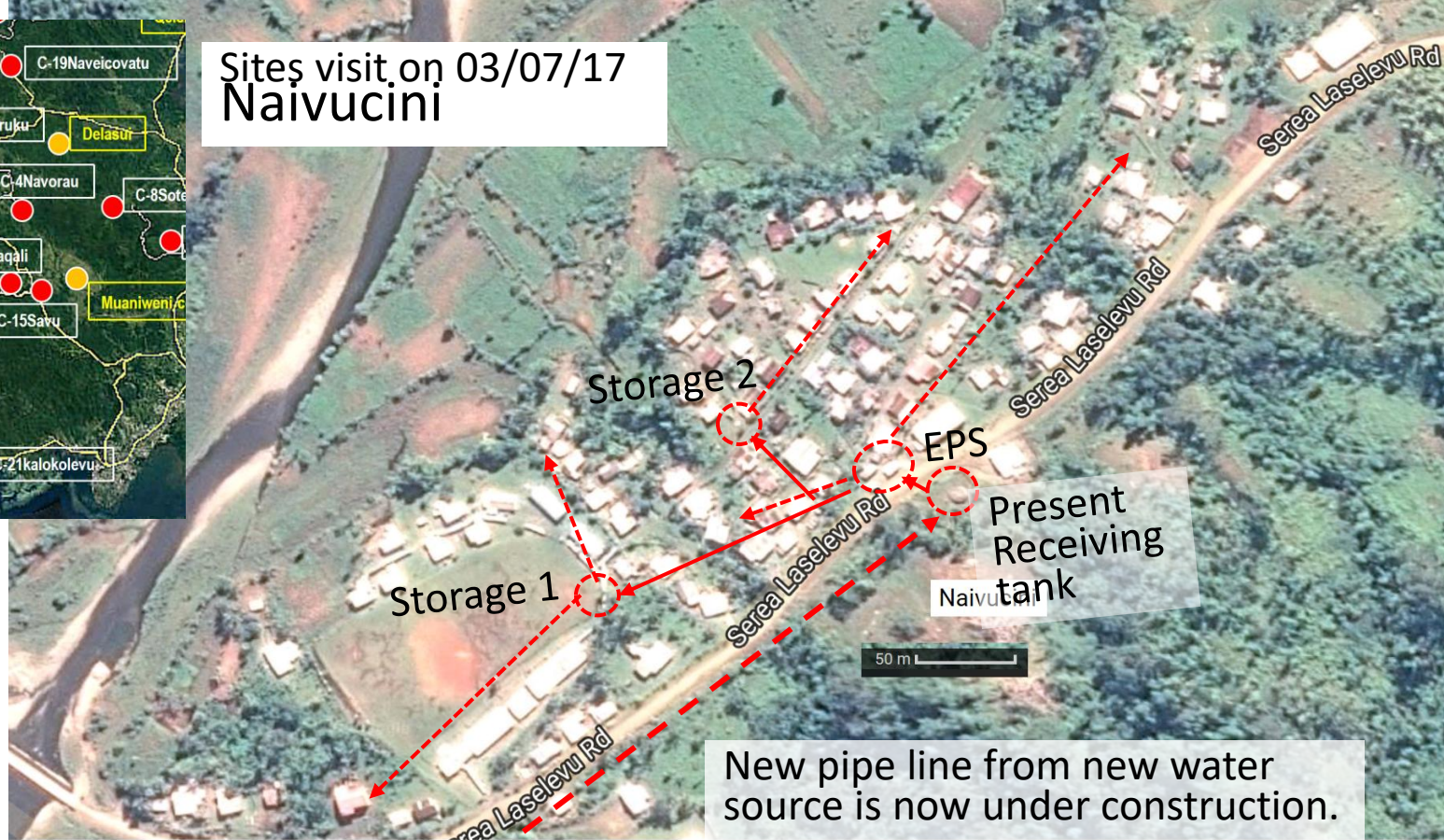


There is non-detected leak, therefore we have to install EPS pipe with may public taps in a small village (even up to 200 persons).

If there is absolutely no leak problem, we may connect to present distribution pipe in case of a small village. But this is risky. I cannot recommend this connection.



Sites visit on 03/07/17
Naivucini



Present Receiving tank.
Water shortage problem.

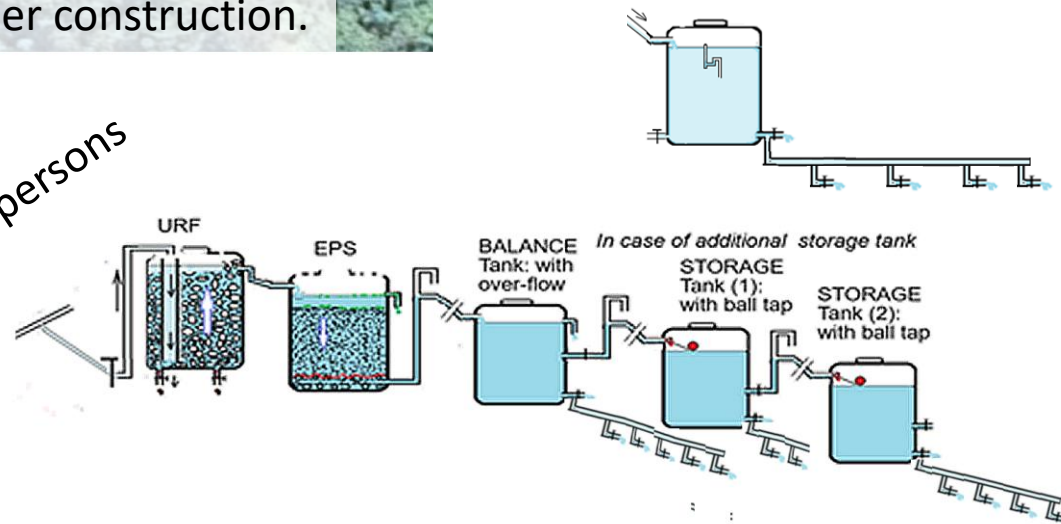
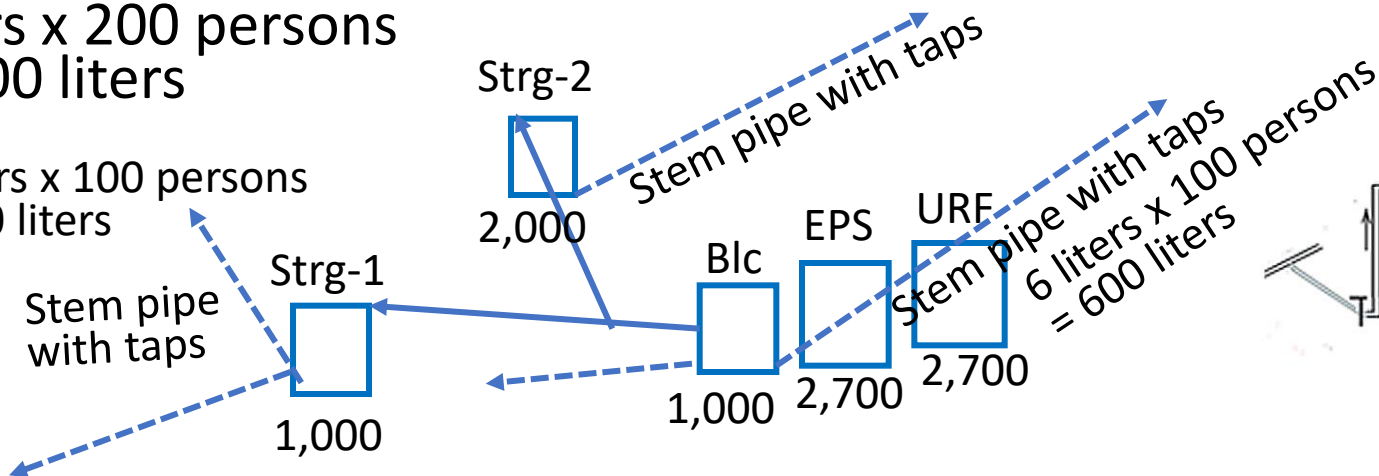


NEMANI TG 9501657
500 persons 120 houses

More use of EPS water is
key to be better quality.

6 liters x 200 persons
= 1,200 liters

6 liters x 100 persons
= 600 liters



Comment on more use of EPS water in a village

Up to 200 persons in a village

If there is no leak problem, we may connect to present distribution pipe in case of a small village. But this is risky. I cannot recommend this connection.

There is non-detected leak, therefore we have to install EPS pipe with many public taps in a small village.

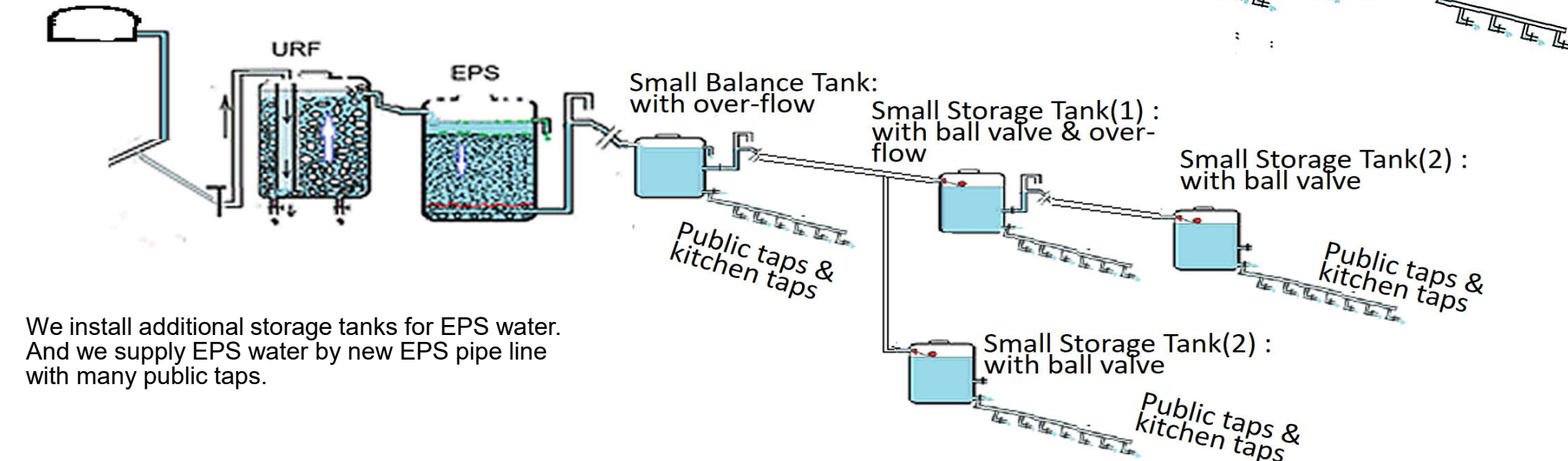


200 to 500 persons in a village

We supply EPS water by new EPS pipe line with many public taps. Or we install additional storage tanks for EPS water. And we supply EPS water by new EPS pipe line with many public taps.

More 500 persons in a village

Present receiving tank



We install additional storage tanks for EPS water. And we supply EPS water by new EPS pipe line with many public taps.

JICA Ecological Purification System design
16/June/2016
ESUKI (HIDE) & NAKAMOTO, JICA 16/JUNE/2016

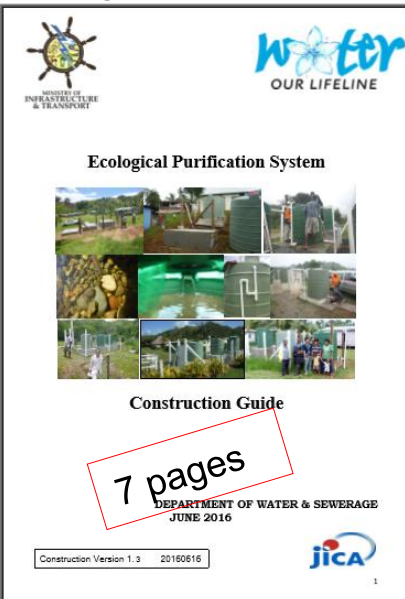



18 pages

DEPARTMENT OF WATER & SEWERAGE
JUNE 2016



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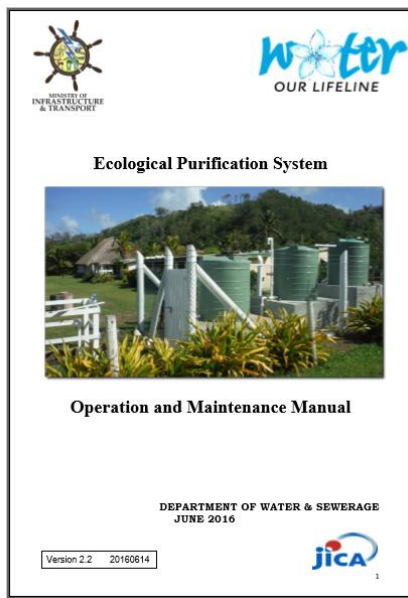
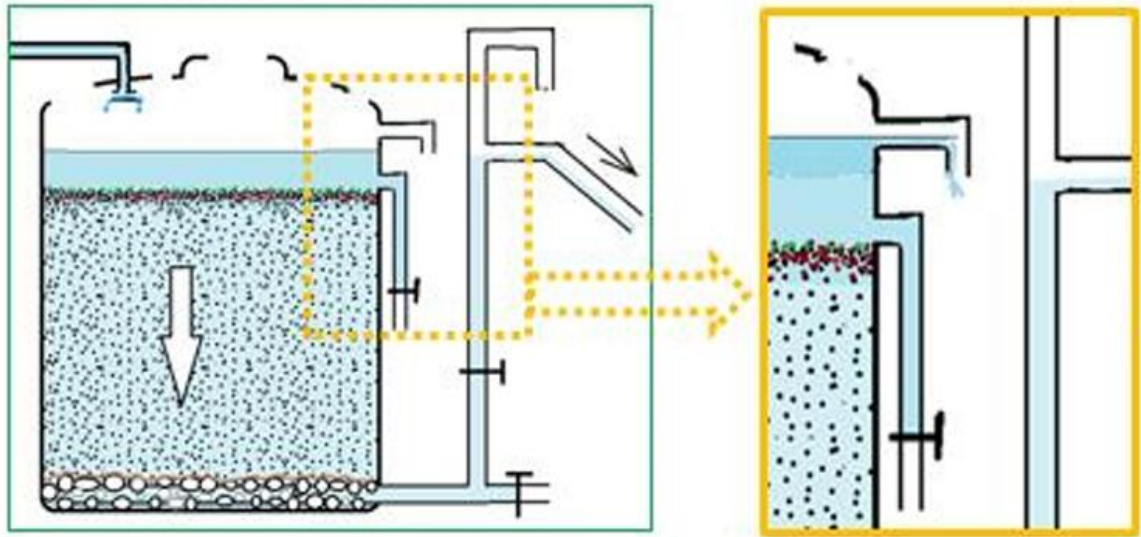


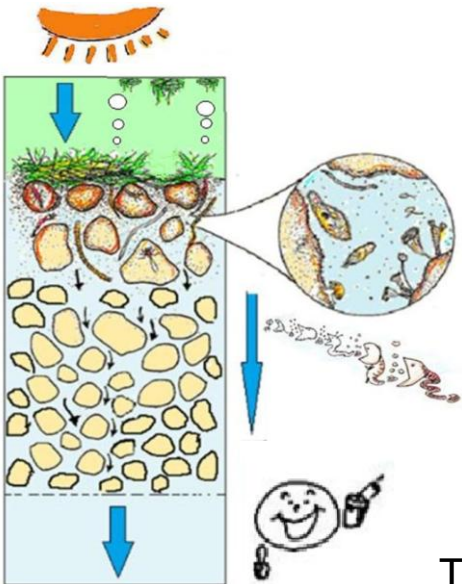
Fig. 18. How to drain and remove surface block matter using drain valve.

Operation and Maintenance Manual June 2016

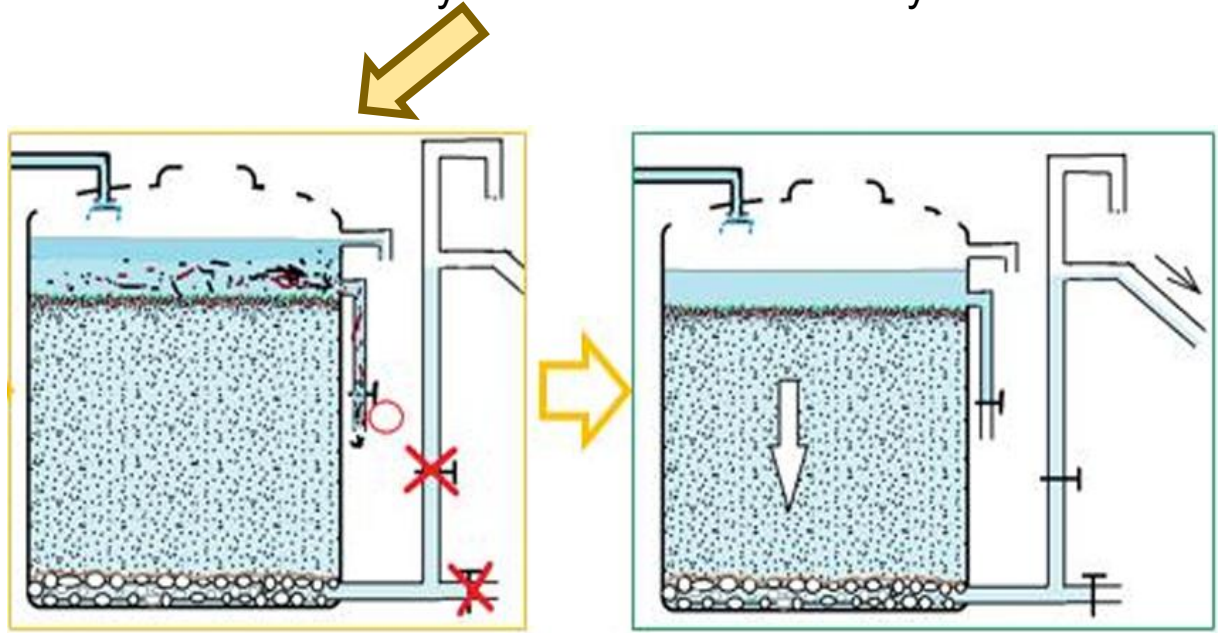


EPS depends on the activity of biological community near the surface of the sand layer.

How to remove excessive amount of muddy matter over the sand layer.

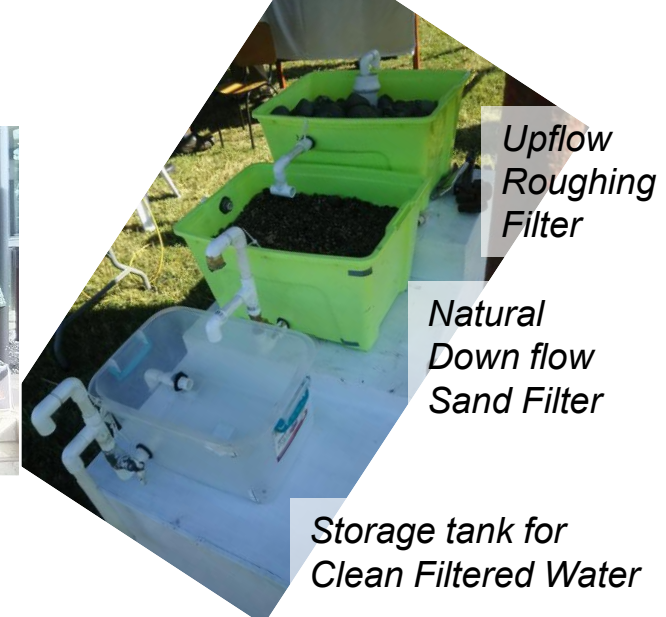


Thames Water tries to use of vacuum scraper to remove surface excessive mud.



World Water Day 2018. March 22/23 Lautoka, Fiji

Receiving tank
Sedimentation



Upflow
Roughing
Filter

Natural
Down flow
Sand Filter

Storage tank for
Clean Filtered Water

Nature for Water



DWS actively
promoted EPS
when it had
the chance.

WHAT IS AN ECOLOGICAL PURIFICATION SYSTEM?

An Ecological Purification System or EPS is a method of purifying water using natural resources such as stones, gravel and sand stored in two or three different tanks where water will filter through the stones, gravel and sand as a purification process before it is ready for drinking or consumption.

Algae grows on the sand surface to provide oxygen and trap particles and remove nutrients. Other micro-organisms decompose organic matters. This food web results in the removal of impurities (organic/inorganic and pathogenic) in the process, resulting in purified water.

This system does not require power or chemicals. It is cost effective and easy to construct.

EPS AT NADELEI VILLAGE, BA

NAVOLAU VILLAGER DRINKING WATER THAT HAD BEEN TREATED BY EPS

water
OUR LIFELINE

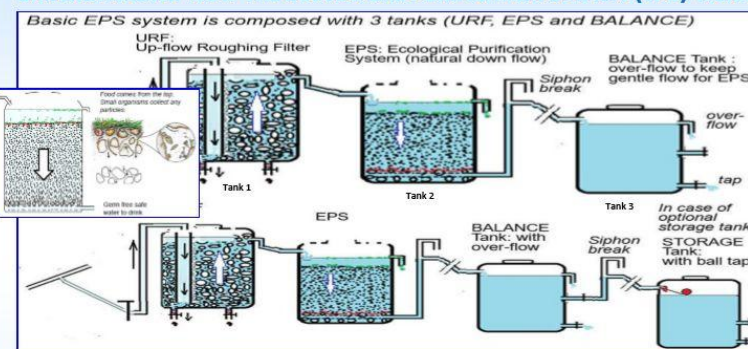
ECOLOGICAL PURIFICATION SYSTEM

The Department of Water and Sewerage is responsible for the implementation of Ecological Purification Systems in Fiji using biological processes of nature to clean and purify water for human consumption.

Contact Address:
Level 3 Nasalavatu House, Samabula, Suva.
Phone: (679) 3310 575 Fax: (679) 3310672

COMPLETE SERVICE DELIVERY THAT IS ACCESSIBLE TO ALL

UNDERSTANDING HOW THE ECOLOGICAL PURIFICATION SYSTEM (EPS) WORKS:



1. Water flows from source into the Upflow Roughening Filter Tank (URF) which has gravel.
2. From the URF Tank, water then flows into the Ecological Purification System Tank (EPS) which consists of sand with algae growth and other micro-organisms (established ecosystem) present to purify water.
3. With the slow filtering, water then passes into a storage tank ready for consumption.

ACCESSIBLE, SAFE, AFFORDABLE DRINKING WATER AND SANITATION FOR FIJI.

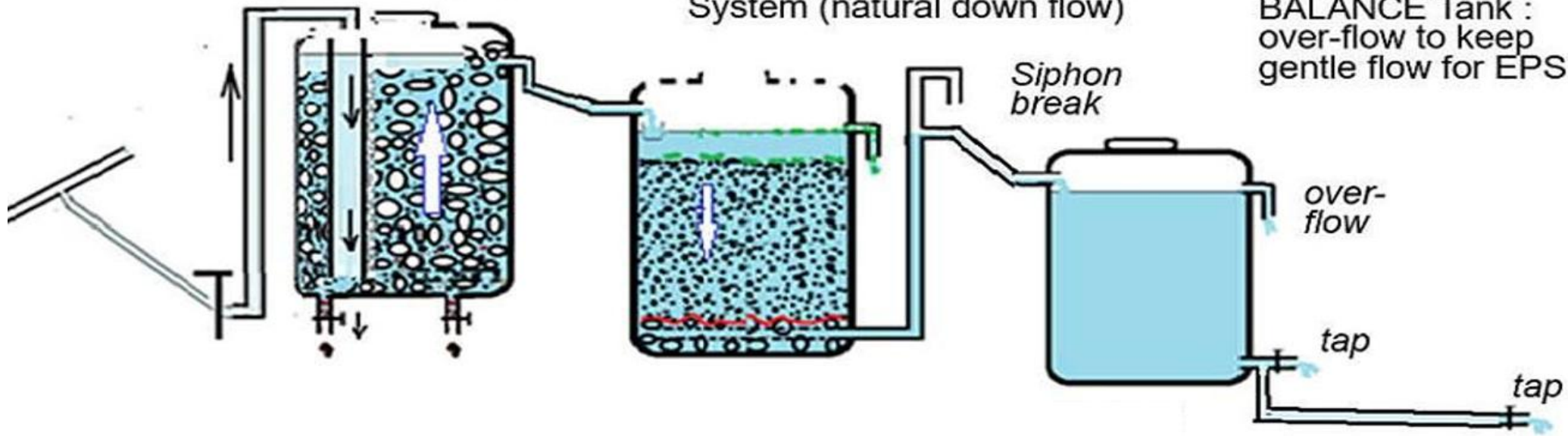
New movement to
make more larger
scale EPS plant
arises by own
activities of a rural
village in March, 2018.



URF:
Up-flow Roughing Filter

EPS: Ecological Purification
System (natural down flow)

BALANCE Tank :
over-flow to keep
gentle flow for EPS

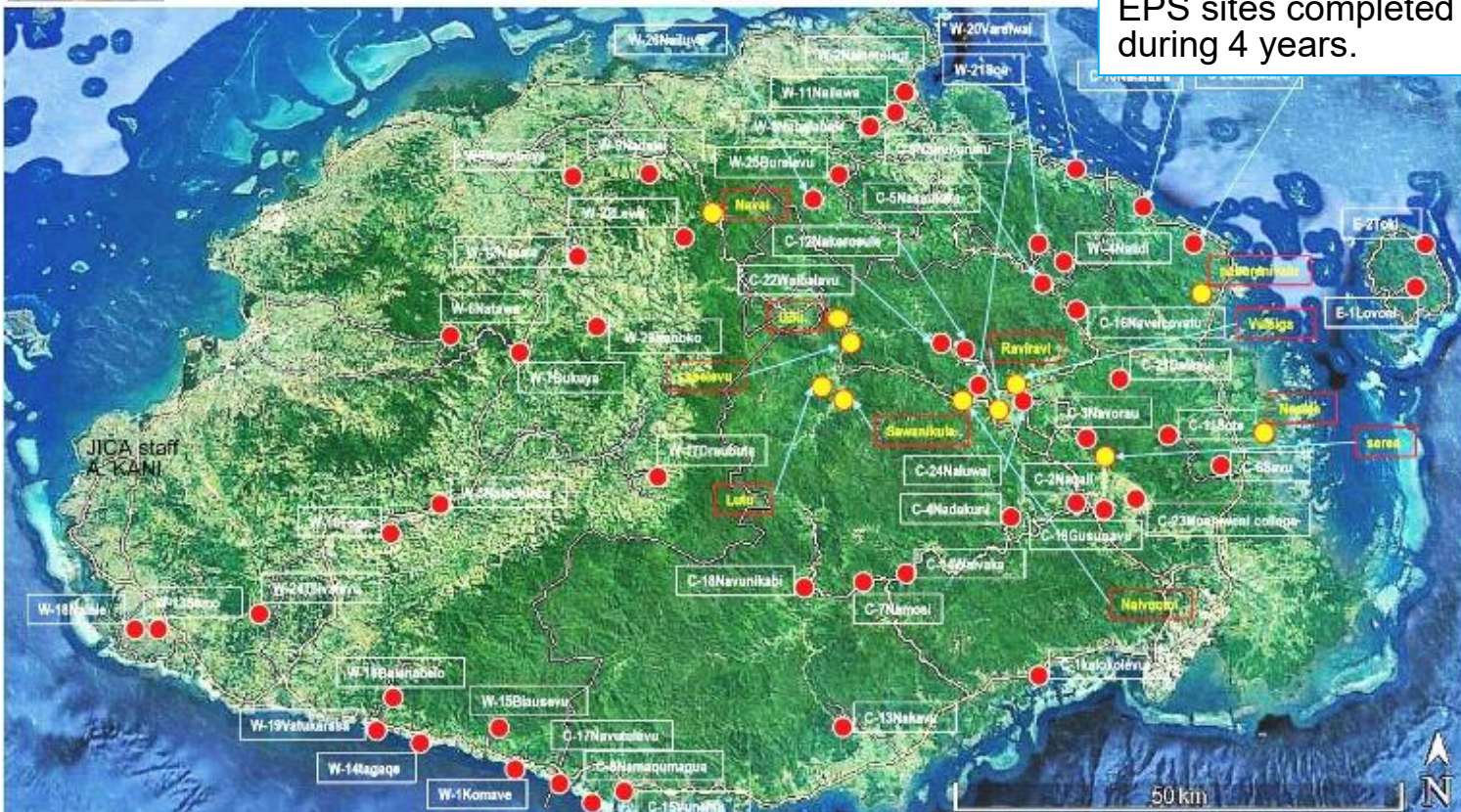




8 times of a month
visit during 4 years.



EPS sites completed during 4 years.



Cleaner Water Project by EPS (Ecological Purification System: Wise Use of Natural Phenomena) for Rural People in Fiji

EPS project started from
Kalokolevu and Navatuvula
in 2013

The project was implemented under the initiative of the Fiji government, and construction of around 30 plants was covered by the government budget every year, and JICA only provided technical cooperation by dispatching Nakamoto and volunteers. EPS technology has been transmitted from Japan to Fiji as a technology that can be done by themselves.



<https://www.youtube.com/watch?v=vji0ay-7GA8>

EPS Fiji Wksp 2019 for safe water/ 7:08

This seminar was held at the end of 4 years EPS JICA contribution (Nov.2014 to Dec.2018) in Fiji by Nakamoto.

People loved the latest advanced technology. However, there is suitable technology for each country. That can be maintained and managed by local people. That is EPS.

EPS Seminar/ Wksp at USP, Suva, Fiji March 2019/ 4:32
<https://www.youtube.com/watch?v=fEl5ghBzfMw&t=23s>

EPS

Public Seminar/ Workshop

*“ An approach to
securing the safe water ”*

Reviewing Fiji's successful EPS implementation at Rural Area and future perspective of implementation in PICs

12 & 13 March 2019

@ Japan-Pacific ICT Centre, USP Laucala Campus



Day 1 09:30~17:00 Public Seminar (inc. refreshments & lunch)

Main Presenter - Dr Nobutada NAKAMOTO*

JICA Expert, EPS advisor for Rural Water Supply
Professor Emeritus of Shinshu University, Japan

* Live lecture from JICA HQ, Tokyo Japan

Day 2 09:00~18:30 Workshop & Study Tour (inc. lunch)**

Workshop - Demonstration of EPS Construction

By Mr Makoto YANO, Okinawa Blue Water, Japan

Study Tour - EPS Site Visit to NAKINI Village

18:30~20:00 - Evening Reception (Cocktail Party)



** Pre-registration is required at Day 1 (close at 11:30) due to limited space.

For further details, please contact JICA Fiji Office by email: jicafj-recept@jica.go.jp or telephone: +679 330 2522



ECOLOGICAL PURIFICATION SYSTEM

Fijian Minister for Infrastructure
opens the Ecological Purification
System Project at USP (The
University of South Pacific)



[https://www.youtube.com/
watch?v=iBcjbocOleQ&t=2s](https://www.youtube.com/watch?v=iBcjbocOleQ&t=2s)
Fiji Government 11 min 21 sec

The implementation of community based Ecological Purification System was made possible through the funding of government. The Fijian Minister for Infrastructure, Transport, Disaster Management and Meteorological Services Hon. Jone Usamate, in saying this, officiated as Chief Guest at the opening of the Ecological Purification System (EPS) Workshop which was held at The University of the South Pacific.

The EPS is a chemical-free and energy-free water purification technology which was initiated by Dr. Nobutada Nakamoto, Professor Emeritus of Shinshu University in Japan.

Also present at the opening event was special guest was Deputy Vice Chancellor of USP Mr. Derrick Armstrong. The workshop is a two-day event hosted by JICA from 12-13 March, 2019 at The University of the South Pacific ICT Centre in Suva, Fiji.



We are all happy!!

EPS

Public Seminar/ Workshop

*"An approach to
improving the environment
by the people"*
Fijian EPS
project for rural
people started
from Jan. 2013.



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ECOLOGICAL PURIFICATION SYSTEM

17:30-18:30 Wrap-up



Fijian people made EPS plants by themselves.

Ecological Purification System for Safe Drinking Water

- Application of Natural Process -

NAKAMOTO Nobutada, Dr. Science
Prof. Emeritus of Shinshu University

Eco-friendly technique to make artificial
spring water



<https://www.youtube.com/watch?v=fEI5ghBzfMw&t=62s>

4min 32 sec

EPS to make safe drinking
water is real our technology.



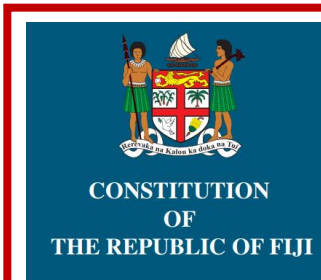
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3. Putting the PLAN into action is NOT enough, we must ACCOMPLISH the goals.



<https://www.youtube.com/watch?v=vji0ay-7GA8&t=254s>

7min 08 sec



This Constitution issued
on 7 September **2013**.

36: Right to adequate
food and water

the right of every person to have adequate
food of acceptable quality and to **clean and
safe water in adequate Quantities.**

*This is Fijian EPS project.
Fijian people made EPS by themselves.*



JICA short term Expert
N. NAKAMOTO
Oct. 2014-Nov.2018
8 times:
Each about
one month

JICA Volunteer
Hide EGUCHI
2015-2016

JICA Volunteer
Isamu SHIOIRI
2017-2018



We assisted a little for this project.

EPS is Our Smart Treatment System. Fijian people realized and certified. We can have safe and delicious water.



<https://www.youtube.com/watch?v=SVuR44Xwu7s&t=43s>

This is a real technical transfer from JICA training.



This Fijian EPS project for rural people still continues until now by Fijian government in 2024.



Pacific Regional Environment Programme
太平洋地域環境計画事務局

<https://www.sprep.org/>

<https://www.sprep.org/news/safe-water-access-in-rural-areas-to-build-climate-resilience-in-fiji-papua-new-guinea-and-solomon-islands>



JICA EPS training in Miyako-Jima, in Aug. 2011.



New plans for cleaner water

For rural people from 2013 in Fiji.



To make artificial spring water from surface water.



Safe water access in rural areas to build climate resilience in Fiji, Papua New Guinea and Solomon Islands