

Ecological Purification System

renamed from Slow Sand Filtration.

An English invention of Slow Sand Filtration to make artificial spring water for safe drinking water is re-defined in Japan as Ecological Purification System.



53
seconds

<https://www.youtube.com/watch?v=b7wPQIKVIMY>

Water Purification and Water Supply Management
for Achieving Water Security

JICA Okinawa training from
Nov. 17. to Dec.12. in 2025.

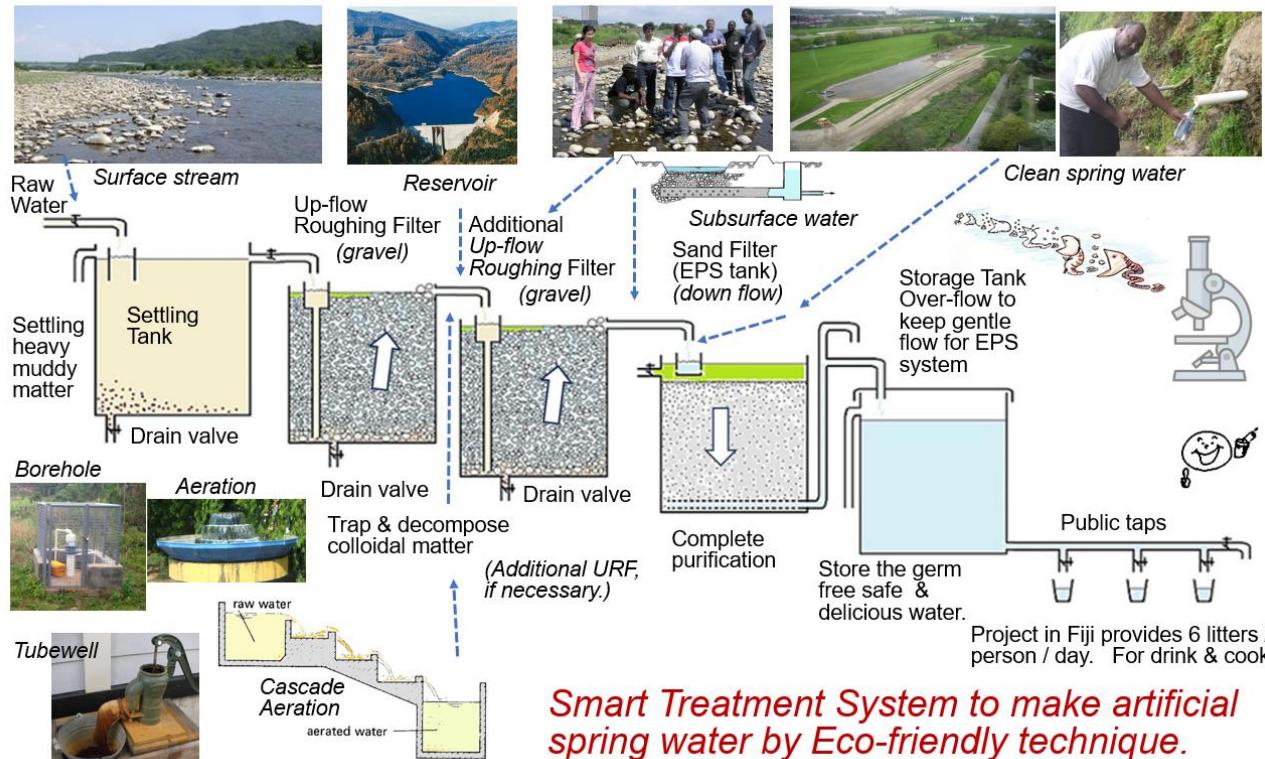
Managed by Makoto Yano,
Okinawa Blue Water



NAKAMOTO Nobutada Dr. Science
Professor Emeritus of Shinshu University
cwscnkmt@yahoo.co.jp

**Nakamoto joins from Nov. 21. to Nov. 27. in Okinawa
and web-contributes Nov.17. and Dec.11-12. from
Ueda city in Nagano, 2025.**

EPS-Use of Natural Process-Chemical Free : Gentle for small organisms



Ecological Purification System for Safe Drinking Water

- Application of Natural Process -
Eco-friendly technique to make artificial spring water

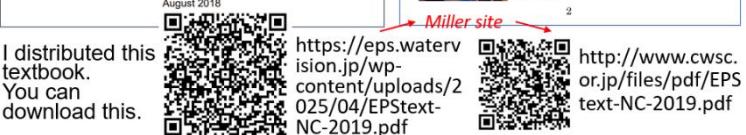
NAKAMOTO Nobutada, Dr. Science
Prof. Emeritus of Shinshu University, Japan



Fig.0. Fijian EPS using rain harvest tanks in a village.

August 2018

I distributed this textbook.
You can download this.

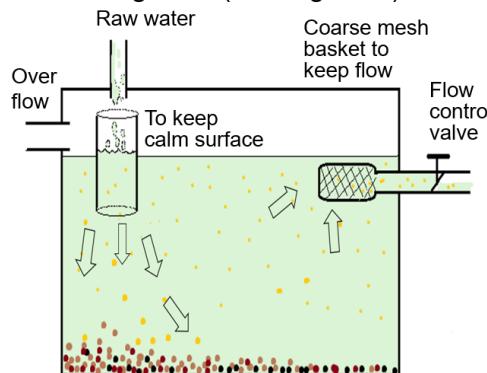


<https://eps.watervision.jp/wp-content/uploads/2025/04/EPSText-NC-2019.pdf>

<http://www.cwsc.or.jp/files/pdf/EPS-text-NC-2019.pdf>

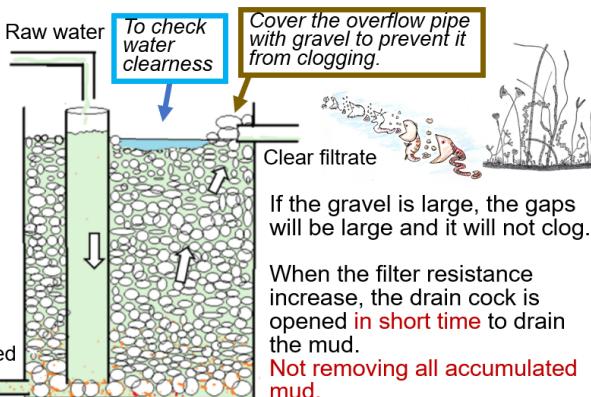


Receiving Tank (Settling Tank)



Up-Flow Roughing Filter (URF) : Gravel Filter

Colloidal fine particles adhesive to the surface of gravels. Small animals scrape them and produces fecal pellets. Fecal pellets accumulated to the bottom.

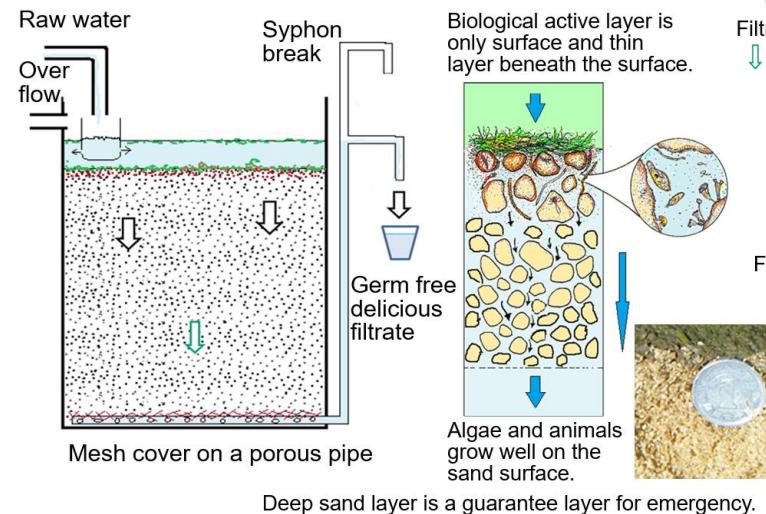


Additional URF if necessary.

Heavy particulate matters are easily settled.

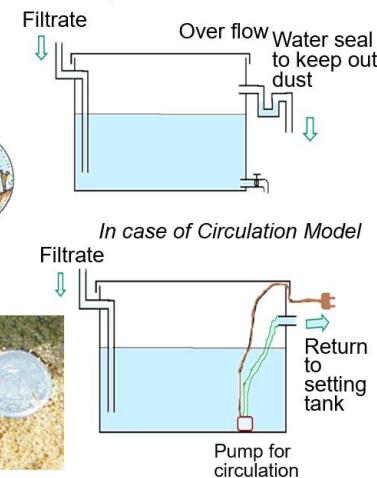
However, colloidal light particles like silt material are not settled in this settling tank.

EPS (Sand) Filter (Natural Down Flow) Ecological Purification System



Storage (Filtrate) Tank

Cover for Storage tank is required to keep out dust.



JICA Training on Ecological Purification System (EPS) in Okinawa, Japan in 2022

DIY EPS bucket model making 2022 - YouTube / 38:01

<https://www.youtube.com/watch?v=jz94KFkLL3E>



NGO Okinawa Blue Water



<https://youtu.be/uMdhSdxOsSsQ>
9 min 45 seconds



Mr. RAMJUG Jawaharlal (Guyana Water Incorporated/ Operations/ Head of Non-Revenue Water) returned back to Guyana from JICA training in Feb. 2015. He made a bucket model of EOS. He made a video on 3rd of September, 2025 and sent us.

I provided additional explanations to the video on Jim's smartphone. I also added photos of the training model created at JICA Hiroshima, a video of trainees in Malaysia, and the construction of a purification plant in Pakistan in 2025.



<https://youtu.be/jXPs1efkgK8>

2:50

https://youtu.be/i0_MjvFavVc

Up-flow Roughing Filter eliminates Suspended Matter without Chemicals.

3

Robert H. Harris et. al. 1974
Consumer Report.
IS THE WATER SAFE TO DRINK?

Chlorine sterilization is essential for rapid filtration of chemical treatment. There is a warning that tri-halo-methane, which are **cancer risk** substances, are generated by adding chlorine.

Research engineers researched ways to prevent turbidity without using chemicals

Rapid Sand Filter

Setting Basin

Storage tank

Raw Water

Mixing

Coagulation, Sedimentation and Rapid filtration Treatment

Sludge

Down flow and Up-flow Roughing Filter Experiment
Master Thesis of Costa, R.H.R.: Univ. São Paulo, Brazil in 1980

Prof. Luiz Di Bernardo, Univ. São Paulo

Up-flow Roughing Filter of different size of sand and small stone.

EPS 2025-OBW
Nov. 21-22-29
9 slides

<https://youtu.be/9aCIRzJwQME>

<https://youtu.be/P9bZnQVXzbg>

Using 4 Bucket Model in JICA training

I studied on ecological function of Miyako-Jima wks from 1997. I made a presentation on EPS function of Miyako wks in March 2004 and published a book (How to make delicious water) in August 2005. →

JICA training began in 2008.

Slow sand filtration: creating clean, safe water (Full ver) in 2020/26min

Slow sand filtration: (Digest ver) in 2021/3.26

Quest for Safe and Delicious Tap Water, Miyako-Jima, in March 2004, /15/2007. With English subtitle version in Oct. 2007.

Ecological Purification System : JICA training for SIWA, April 18, 2015 at Miyako-Jima.

https://www.youtube.com/watch?v=6_uUZE_8E&t=1218s

https://www.youtube.com/watch?v=qAHSeAgf_0s&t=37s

https://www.youtube.com/watch?v=7vNCjBoeHNM0

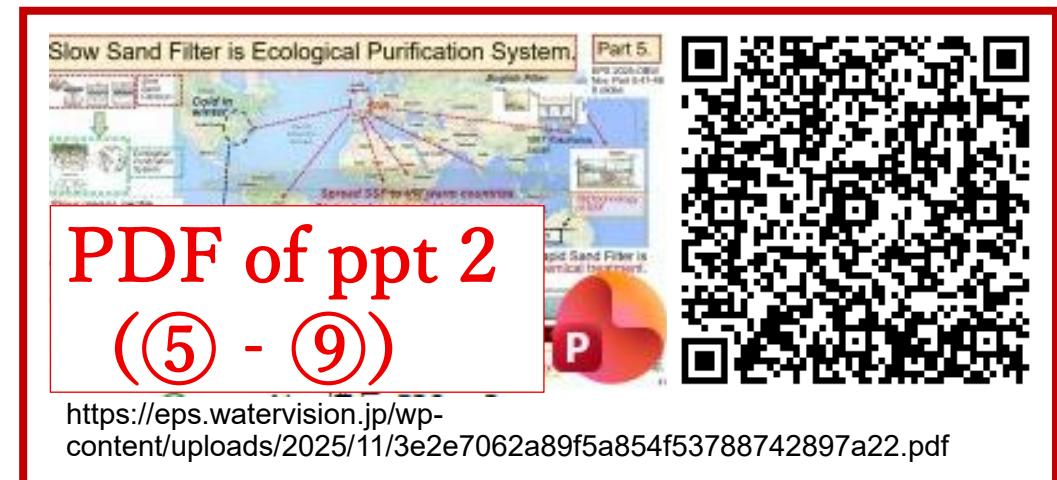
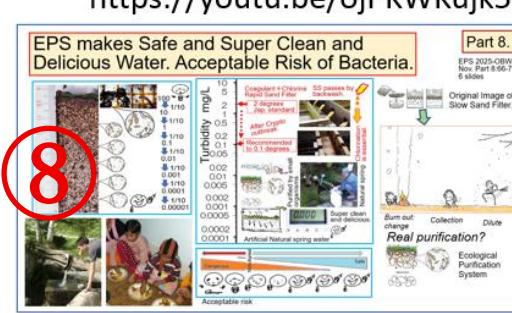
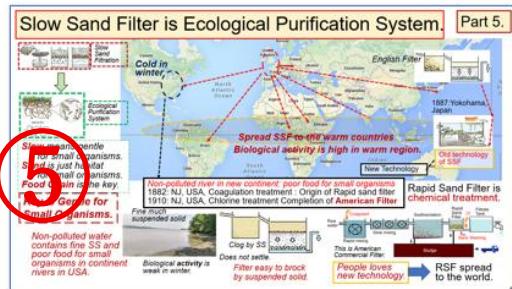
EPS-2024-OBW
Nov. Part 30-39
10 slides

Part 4

PDF of ppt 1 (1 - 4)

<https://eps.watervision.jp/wp-content/uploads/2025/11/30d0919a92cc2928dba3cd7d5ce951e4.pdf>

A large QR code is centered on the page, intended for scanning to access the digital content of the book.



EPS is Wise Application of Nature Purification System. Part 10.

Wise Application of Nature Purification System. Rural people can manage this system.

Simple system can be easily managed by local people.

Small simple system is suitable in rural area than high tech system in urban area.

Chlorine is essential for safe water.

American RSF is a commercial filter. SSF of EPS is a natural filter.

Think about where the money is going.

10

EPS 2025-OBW Nov. Part 10.10-118 9 slides

<https://youtu.be/2r8MWh6q5PA>



Solving filter block problem in Samoa.

Alaoa WTP, August 2009

Alaoa WTP, after heavy rain

The German consultant who designed it could not have imagined the heavy rains of Samoa. The new recommendations to prevent extreme turbidity in tropical regions where heavy rainfall occurs.

3:28

JICA EPS training in Miyako-Island from 2006 to 2008.

Intake Bar Screen filter

Agreement to Samoa Water Authority Then, Miyako-Jima's Water Supply Model Project in Samoa from 2010 to 2012 was done.

11

EPS 2025-OBW Nov. Part 11.90-99 10 slides

<https://youtu.be/v82qaSSzE9c>



Every Rural People for Safe Water in Fiji

Right to adequate food and water

36-(1) The State 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.

THE REPUBLIC OF FIJI

Constitution of the Republic of Fiji

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

The PM had attention for EPS display during the World Marine Time Day on Sept. 28, 2012. Mr. Vishwa Jeet informed the PM the functions of EPS and the importance of EPS to Fiji. The reference to JICA was made.

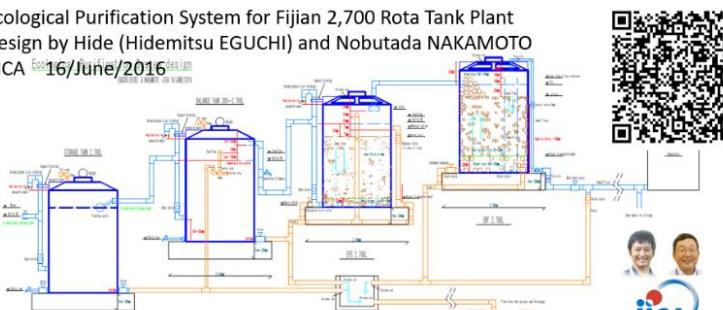
2

EPS 2025-OBW Nov. Part 12.100-119 20 slides

<https://youtu.be/lKk3yQBghYE>



Ecological Purification System for Fijian 2,700 Rota Tank Plant
Design by Hide (Hidemitsu EGUCHI) and Nobutada NAKAMOTO
JICA 16/June/2016



Operation and Maintenance Manual June 2016

https://eps.watervision.jp/wp-content/uploads/2025/04/160614-Eng-Fiji-EPS-Manual_Eng.pdf

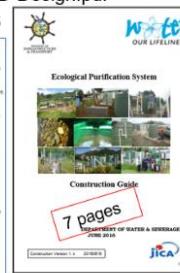


https://eps.watervision.jp/wp-content/uploads/2025/04/EP_S_design.pdf



<https://eps.watervision.jp/wp-content/uploads/2025/04/Fiji-EPS-2016-tank300-2700CAD-Design.pdf>

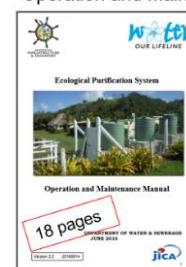
Construction Guide June 2016



**PDF of ppt 3
(10 - 12)**



<https://eps.watervision.jp/wp-content/uploads/2025/11/eee2443dac46066fbf5c0d1ea92839b2.pdf>



18 pages



EPS is Wise Application of Nature Purification System. Part 10.

Wise Application of Nature Purification System. Rural people can manage this system.

Rapid Sand Filter

Intake Bar Screen filter

7 pages

**10 - 12
Japanese**

2025-Nov-横長-EPS-3-P10-12

EPS 2025-OBW Nov. Part 10.10-118 9 slides

日本語での解説

<https://youtu.be/qi31pZmAwvM>
その3. ppt3. (81-120)日本語解説 11:20



JICA EPS Training started from Miyako-Jima, Okinawa.
EPS is Wise Use of Natural Purification System.



https://youtu.be/1mKg_P7DFIs



Part 13.
EPS 2025-OBW
Nov. Part 13-121-126
4 slides

Miyako-Jima island is an uplifted coral reef island where is quite different environment compared with main part of Japan.
Area of islands of Miyako-Jima is 264 km², population is 55,000 persons.



<https://youtu.be/mph2NIHyswo>



EPS is Wise Application of Natural Ecosystem.
Key are Dissolved Oxygen and Gentle Flow.



<https://youtu.be/eORovvI89sk>



EPS from Japan to the World

This is Smart Applied Ecology for Human Life.



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.

Mechanism of EPS
7 minutes
<https://www.youtube.com/watch?v=ArWM3PVY3GM>

79 to 139

JICA EPS Training started from Miyako-Jima, Okinawa.
EPS is Wise Use of Natural Purification System.

Part 13.
EPS 2025-OBW
Nov. Part 13-121-126
8 slides



PDF of ppt 3
(13 - 15)

<https://eps.watervision.jp/wp-content/uploads/2025/11/84356be9d811bb52b5b34bf958ab3f0b.pdf>



13 - 15

Japanese

2025-Nov横長-EPS-4-P13-15



日本語での解説
<https://youtu.be/hT-rFLZsR7o>
その4. ppt4. (121-140)日本語解説 6:46