

# ⑪ EPS: Our Technology, Trust Our Sense.

⑪ 12 slides



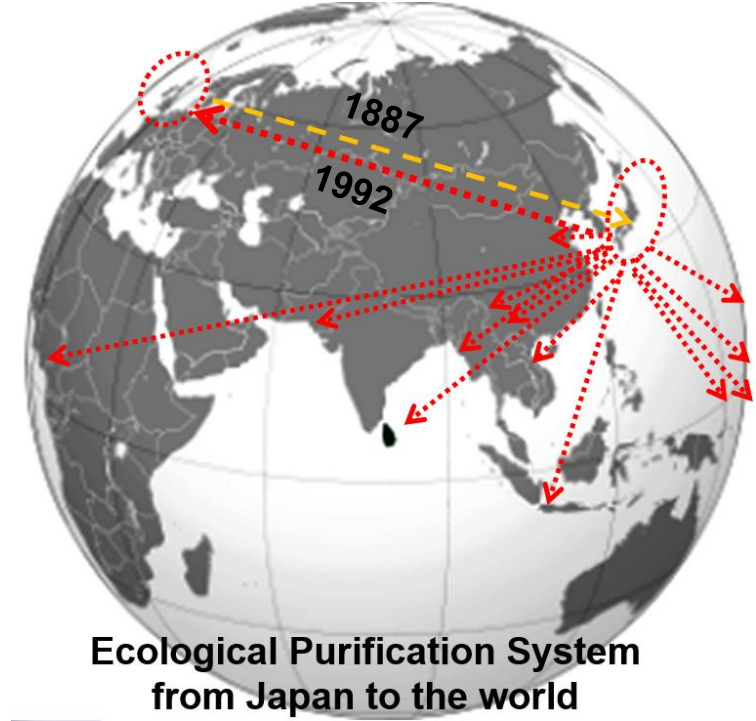
*Super clean delicious water*



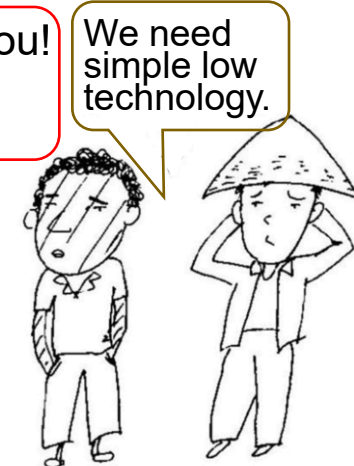
## Remember Three Steps

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.

## Trust Our Sense !



**Ecological Purification System  
from Japan to the world**



**Don't believe  
the commercial.**



Confirm by yourself.  
Don't believe commercial.

Trust your true sense.

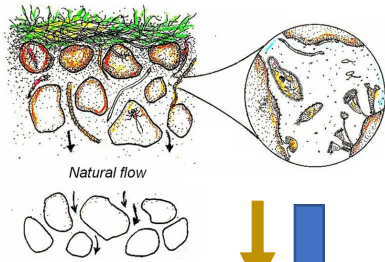
I, applied biologist, began to study the role of algae in slow sand filter pond.

I noticed SSF has been misunderstood by the name. This is Ecological purification system.

This system is wise application of natural system to make an artificial spring water.

## Slow Sand Filter

### Ecological Purification System



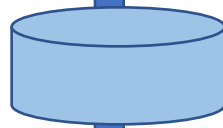
Settling pond

## Main Process

### Slow Sand Filter

### Ecological Purification System

Natural Filter



Chlorination

Filtrate tank



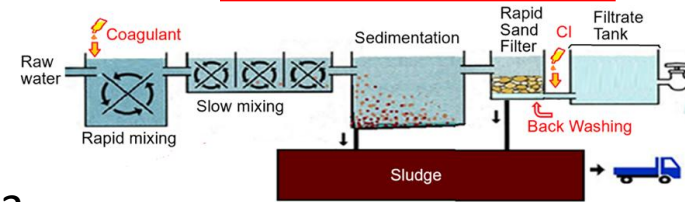
56,000m<sup>3</sup>/day capacity



1923  
Someya  
WPT

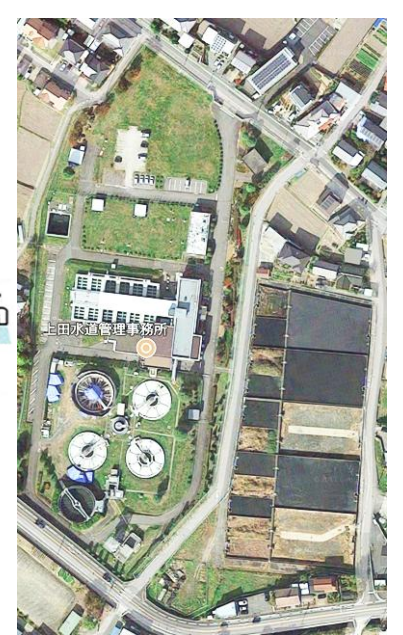
Rapid Sand Filter

Chemical Physical Treatment



Activated carbon

48,000m<sup>3</sup>/day capacity



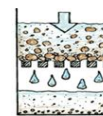
1964  
Suwagata

Main Process

Pretreatment  
(coagulation/ mixing/ settling)

Rapid Sand Filter

Commercial Filter



Chlorination



Sludge treatment

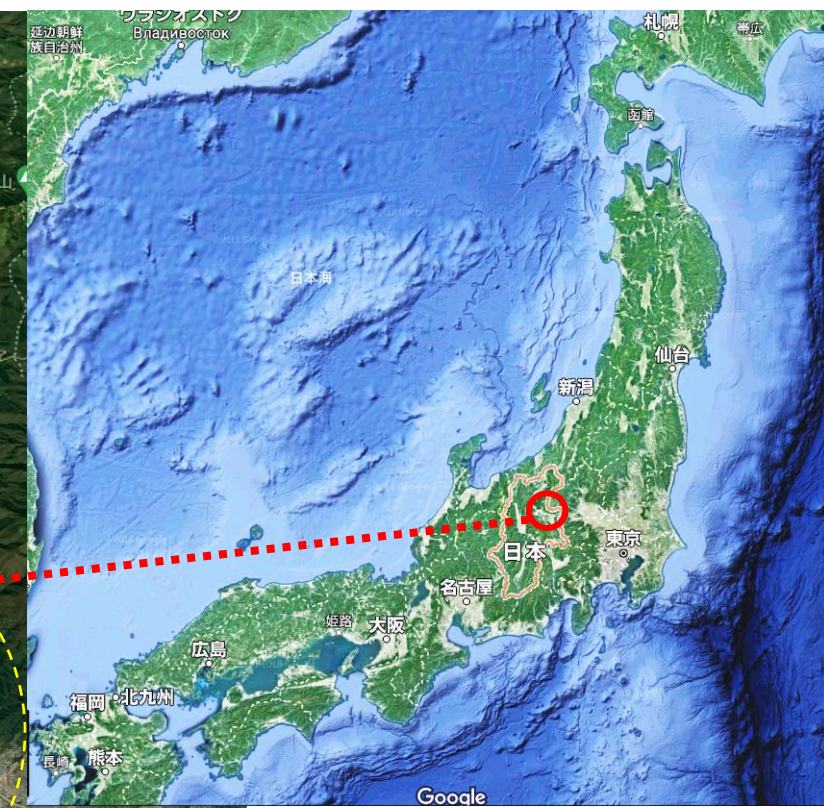
Sludge

Back Washing process is essential.



# Nagano prefecture

Ueda city



Suwagata WTP

Rapid Sand  
Filter plant

I found this is a  
commercial  
filter.



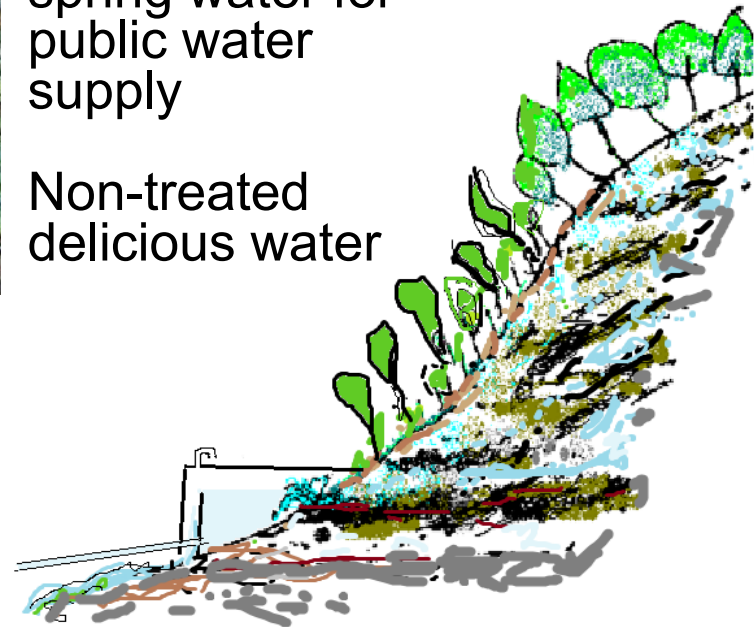
Someya WTP  
This is natural filter for ours.





Collect natural  
spring water for  
public water  
supply

Non-treated  
delicious water



**There are many  
plants of non-treated  
supply systems in  
rural area in Japan.**





Surface water of River Ohta

Settling + Sedimentation

Toita Intake  
+Settling



**Fuchu WTP (Slow sand filter) : From May 6, 1965,  
capacity 27,000m<sup>3</sup>/day**

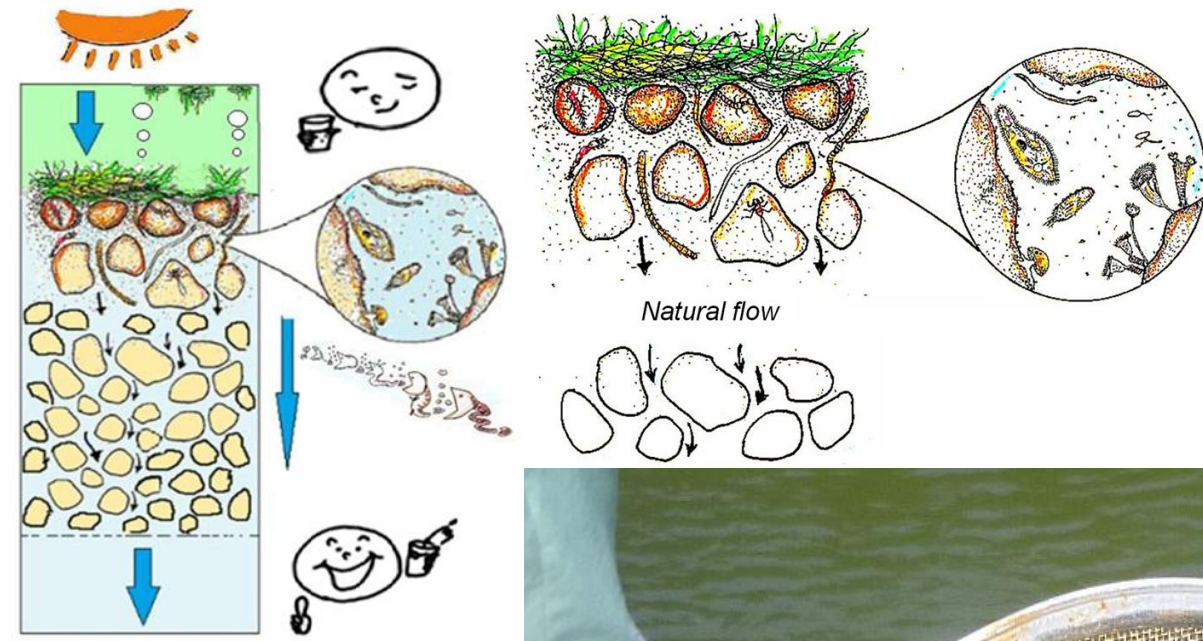


In July, 2017, at that time, Fuchu WTP was working.



Present view by  
Google map in  
2025





Microscopic organisms actively work on the sand layer and purify the water.





When we can understand EPS, we can make the plant for our life by ourselves.



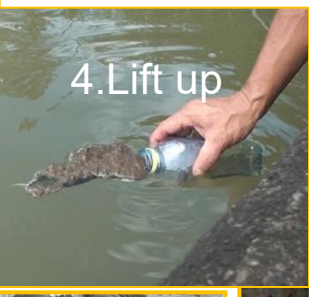
1. Shallow depth



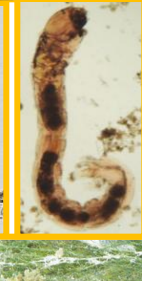
2. Photosynthesis



3. Bubbles



4. Lift up



8. Sand is habitat



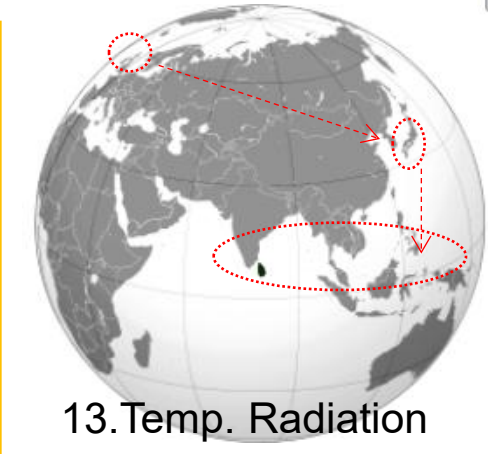
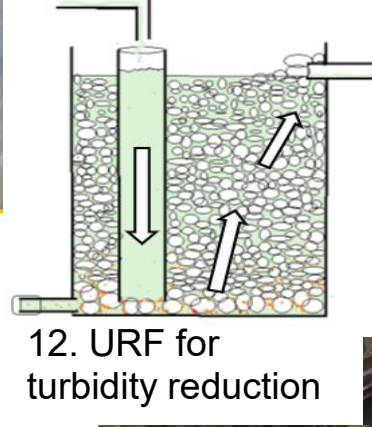
9. Large size of sand



10. Short passing time through active layer.



11. Fast flow rate



13. Temp. Radiation



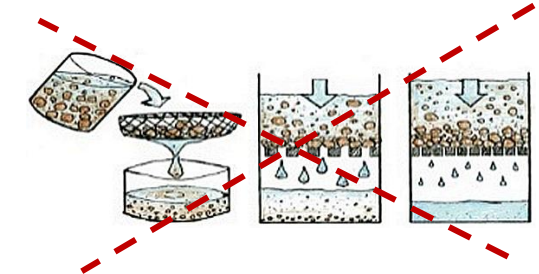
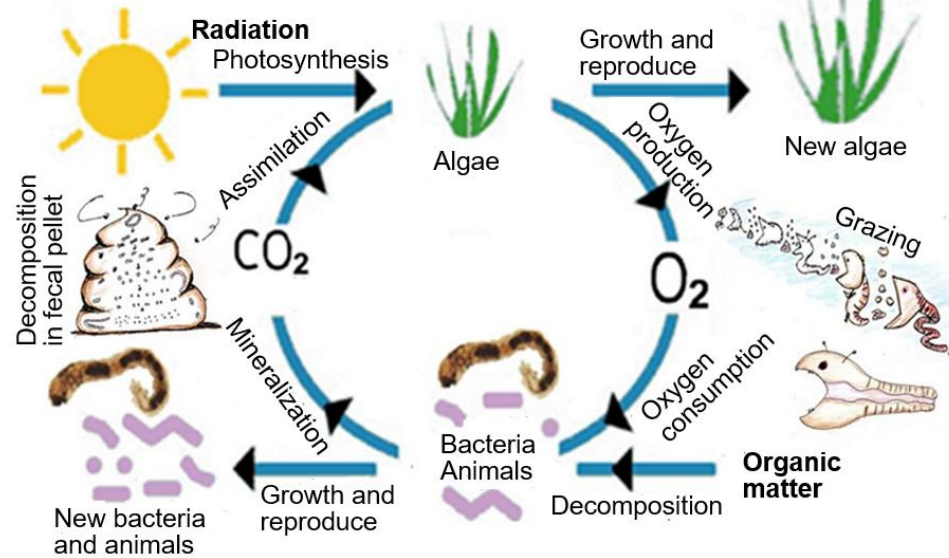
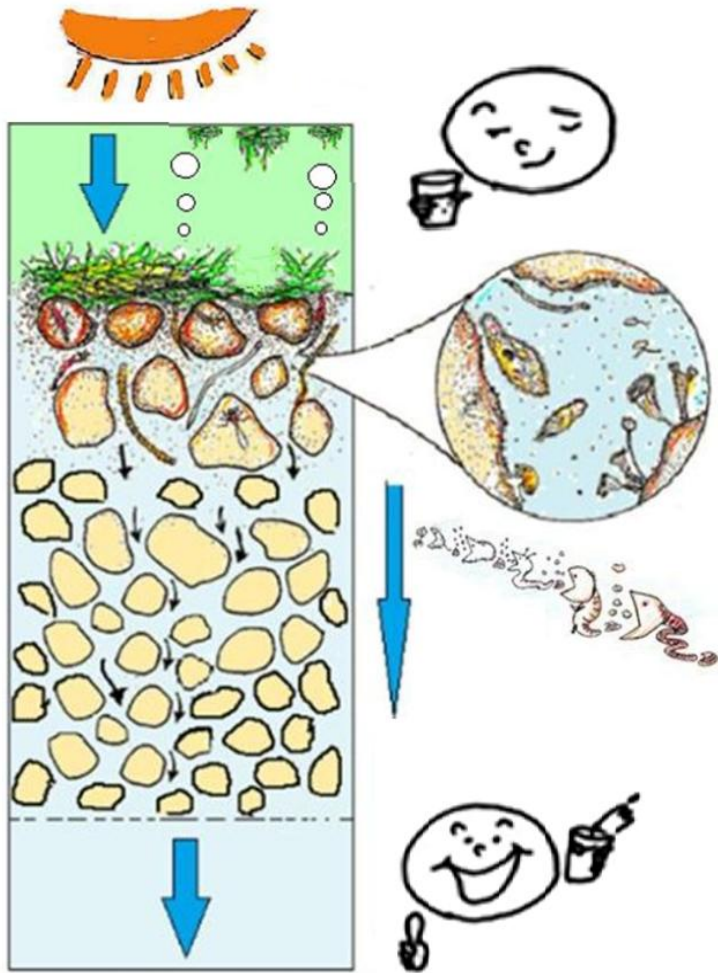
Gentle: chemical free

EPS is Eco-Friendly Smart Technology.



Food chain is the key for real decomposition.

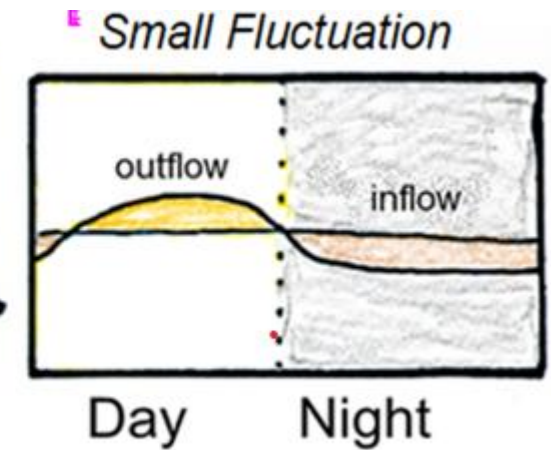
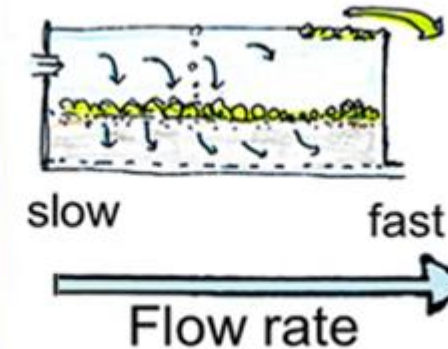
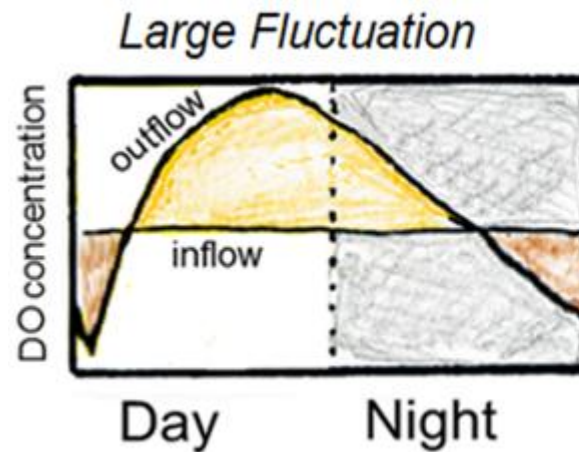
Purification mechanism of **SSF** was **misunderstood** under the name.



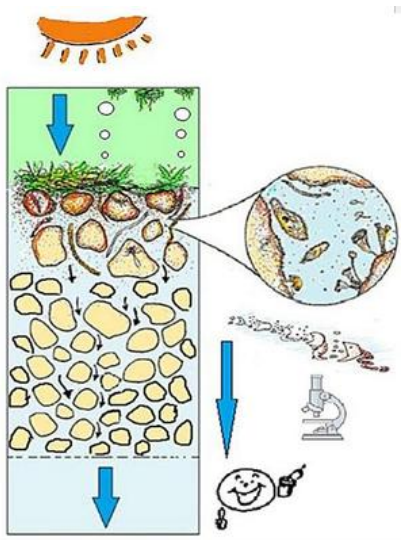
Ecological  
Purification System:  
EPS

Don't remove biological  
active layer.

Aerobic condition is essential. Gentle for small organisms.

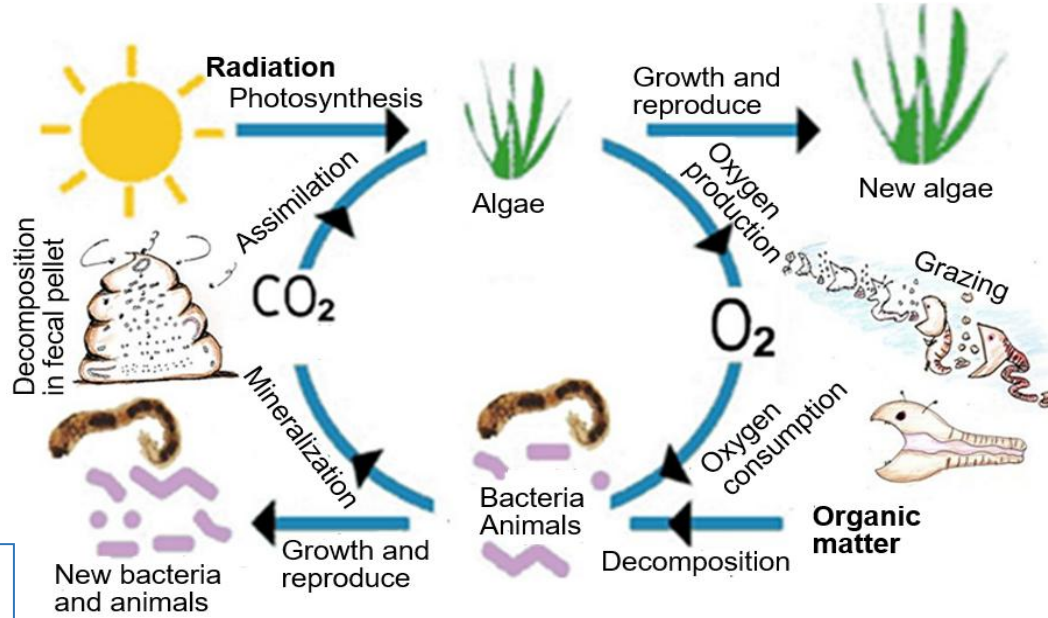






The sand does not move even when the flow rate changes.

Slow sand filtration is a purification process that relies on the efforts of a biological community. **Algae produce oxygen** through photosynthesis, and **the presence of dissolved oxygen creates an environment in which heterotrophic organisms can thrive without worry**. Slow does not refer to speed, but to being gentle to the organisms.



Idea of EPS spreads from Japan to the world.

My first visit to Thames Water Company was on **August 19<sup>th</sup> in 1992**. I explained my study on the role of algae in SSF system in Ueda.



Ashford Common WTP

**About higher flow rate asked by N. Nakamoto**  
**Michael Chipps** Principal Research Scientist  
 2025/03/18

Since your visit (Aug. 19th 1992) we have added DO and turbidity monitoring on the outlet of all SSFs. Thames Water's asset standard says we can operate up to **0.5 m/h(12m/d)**, but in reality, we are usually in region of 0.25 to 0.35 m/h, but we can reach 0.4 m/h occasionally if we have to. We do have keep a careful eye on dissolved oxygen (DO).





Ecological Purification System (EPS) : This is Wise Use of Natural Phenomena.  
 This is Chemical Free System to make Artificial Delicious Spring Water.  
 This is a Smart and Eco-friendly technique.



Surface water of river



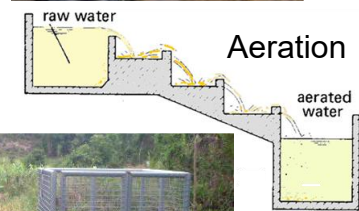
Reservoir, lake



Clear spring water



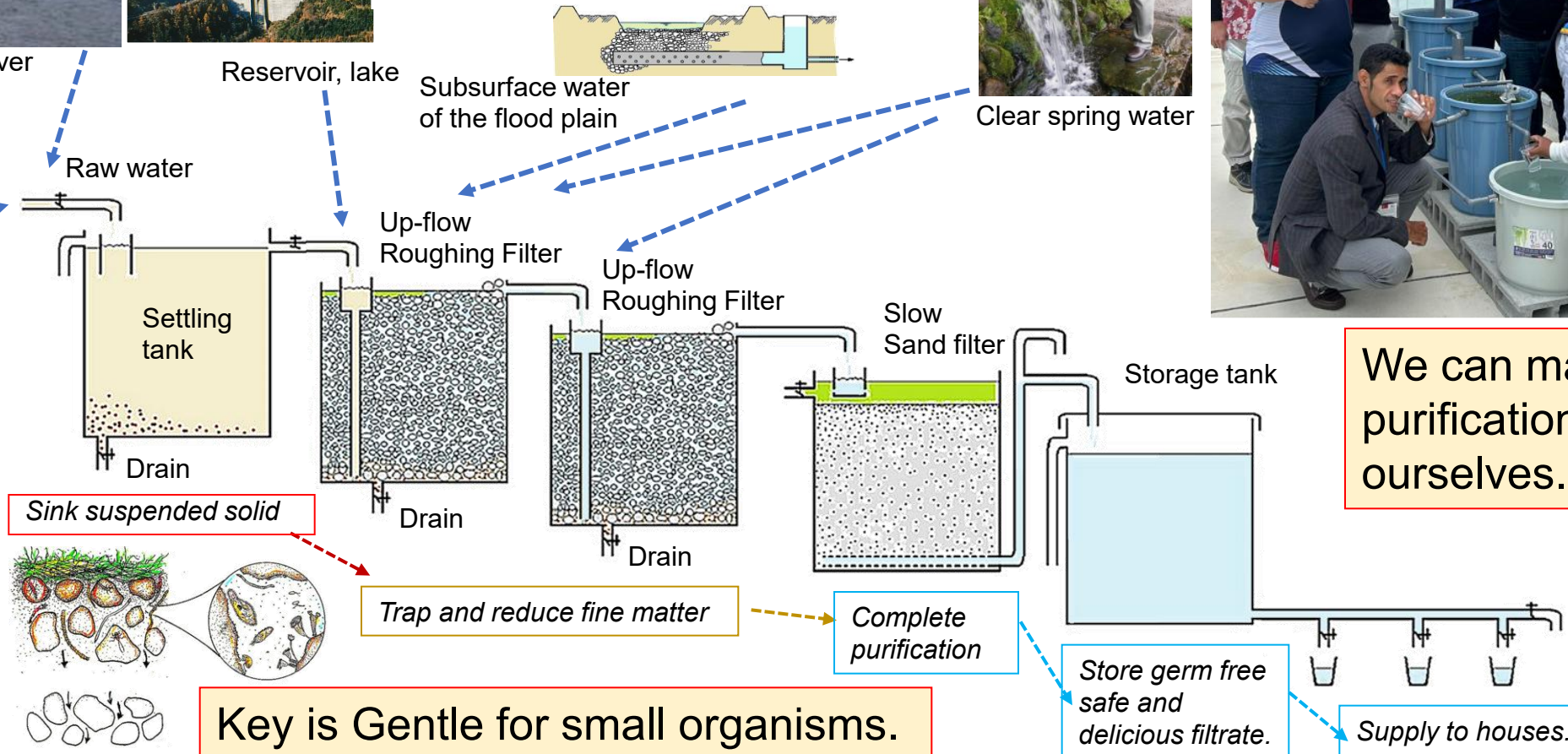
Well



Aeration



Aeration

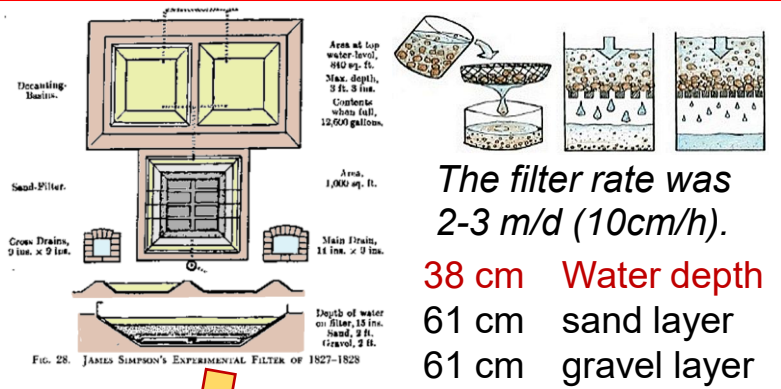


Key is Gentle for small organisms.

We can make EPS purification device ourselves.



The name of **Slow Sand Filter** caused a **misunderstand** of real mechanism.

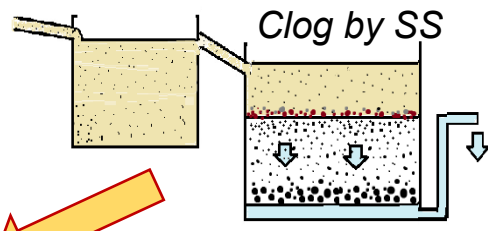


The filter rate was 2-3 m/d (10cm/h).  
 38 cm Water depth  
 61 cm sand layer  
 61 cm gravel layer

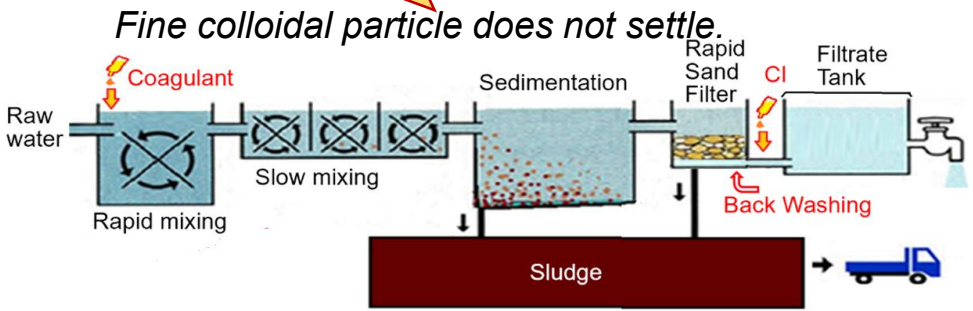
They believed **mechanical reduction** by **slow** filtration with **fine sand** in 200 years ago. They called **Slow Sand Filter**.



SSF spread to USA.



Refocus to SSF of chemical free system.

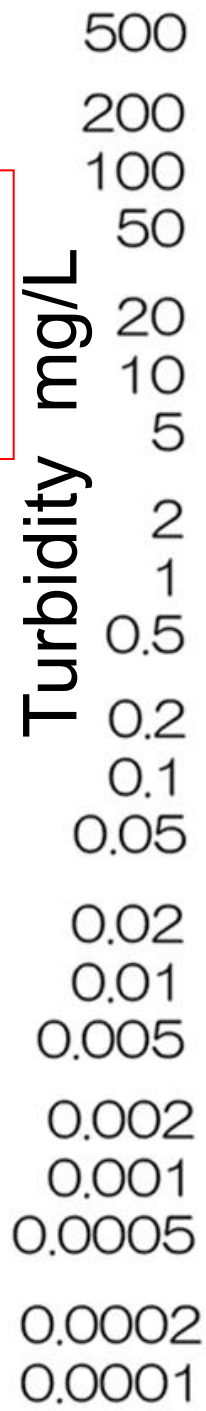


This is American Commercial Filter.



**Back washing** → RSF spread to the world.

I proposed Ecological Purification System instead of Slow Sand Filter in Japan.



Storm event

Major turbid matter in mountain stream is easily set within several hours.

Coagulant + Chlorine  
Rapid Sand Filter

SS passes by backwash.

2 degrees  
Jap. standard

After Crypto outbreak.

Recommended to 0.1 degrees

Chlorination is essential.

Purified by small organisms

Natural spring

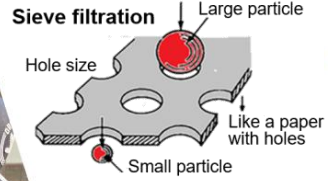
Artificial Natural spring water

Super clean and delicious.



# EPS from Japan to the World

Wise Use of Natural Phenomena for Human Life.  
Safe and Delicious Water by EPS, Our Technology.

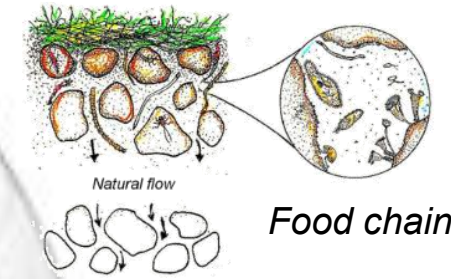


## Slow Sand Filter



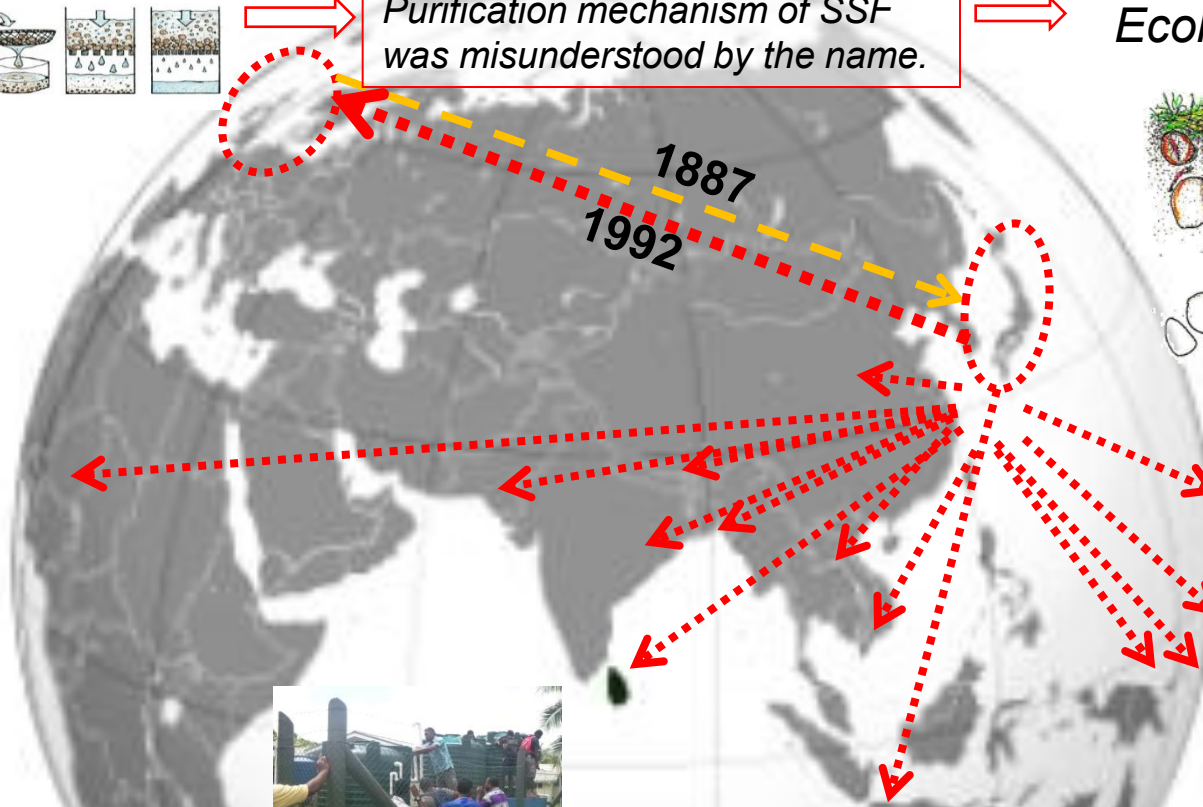
Purification mechanism of SSF  
was misunderstood by the name.

## Ecological Purification System



Gentle for small  
organisms

Food chain



Trust Our Sense !  
Super clean delicious water



Nigeria



## 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.



# Ecological Purification System

July 13 (Mon) am 10- pm 16. 2026,  
at JICA Tokyo Center

**NAKAMOTO** Nobutada,  
Professor Emeritus of  
Shinshu University,  
Dr. Science

cwscknmt@yahoo.co.jp  
<https://eps.watervision.jp>

## Contents:

① Introduction : EPS

② Quest for Pure Water  
from **SSF** to **EPS**.

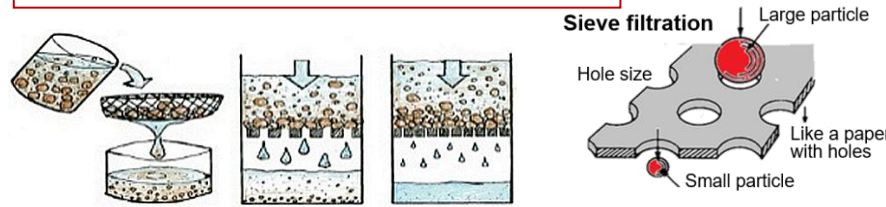
③ Water Cycle, Safe  
and Acceptable Risk.

④ Food Chain is Key.

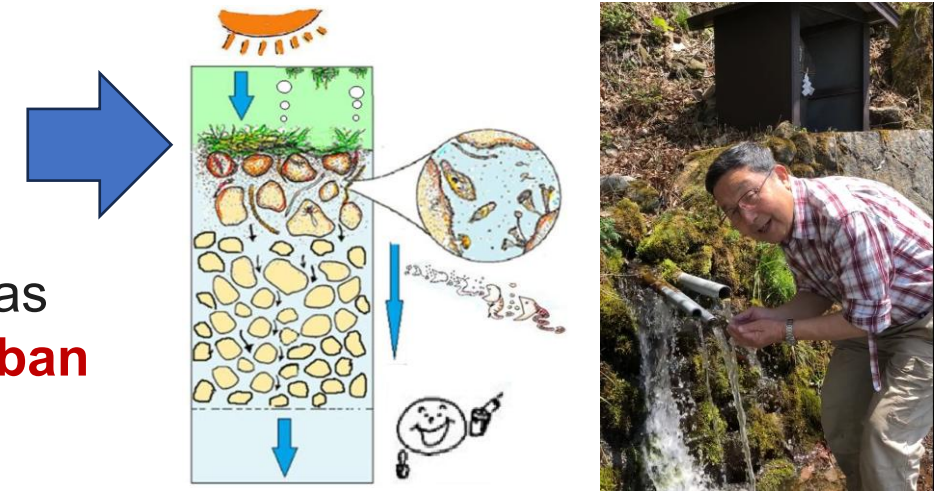
⑤ URF and EPS Model.

Purification mechanism of **SSF** was **misunderstood** under the name.

## Image of Slow Sand Filter



**200 years** have passed, since SSF was  
developed to supply clean water to **urban**  
areas in **London, UK**.



**SSF** is to make **artificial spring water**  
by biological community.

I, Nakamoto proposed **new name**  
of **EPS** instead of **SSF**.

Hiroshima City Waterworks Bureau  
(広島市水道局)

JICA-Hiroshima training on: Operation and  
Maintenance of **Urban Water Supply System**  
(Water Distribution and Service) from **July** to **Aug.**,  
**2026** JICA広島：都市上水道維持管理（給・配水）

⑥ EPS trial in Malaysia and Guyana

⑦ From Miyako Island to Samoa

⑧ From Okinawa to Fiji

⑨ EPS as the Social Contribution

⑩ Sri Lanka, Pakistan

⑪ **EPS: Our Technology, Trust Our Sense**