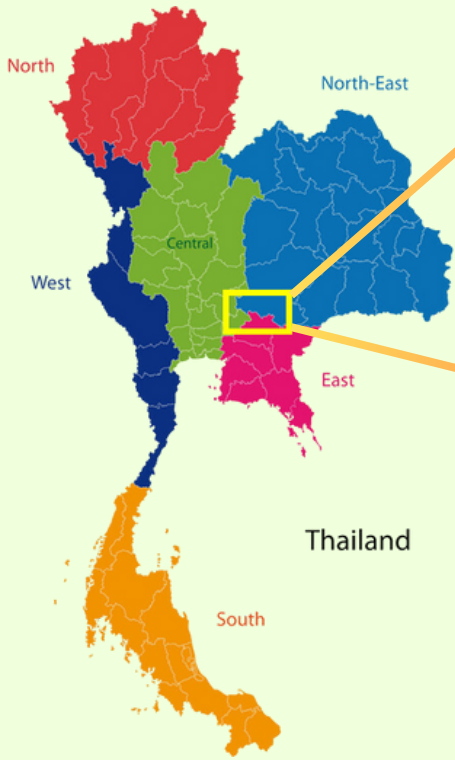




Triple-A Team Khao Yai National Park



by Peerawit Janta, Chonticha Deela, and Ei Ei Phyo



Khao Yai, the first National Park in Thailand, covers 11 districts in four provinces: which are located in the Phanom Dong Rak mountain range and a part of the Dong Phrayayen Forest, previously called Dong Phrayayen. Not only the large area (more than 1200 km²) in Khao Yai National Park but there also contained a large number of plant and animal species. Moreover, Khao Yai Park has various rare and endangered species of mammals such as Wild Elephant, Tigers, and Banteng. This is the reason why Khao Yai National Park is targeted by several travelers. According to the Department of National Parks, wildlife and Plant Conservation report in 2024, there were 1.49 million travelers (An average of 4070 people/day) who did many activities in Khao Yai National Park such as Birdwatching, Trekking nature trails, Camping, Night Safari, etc.

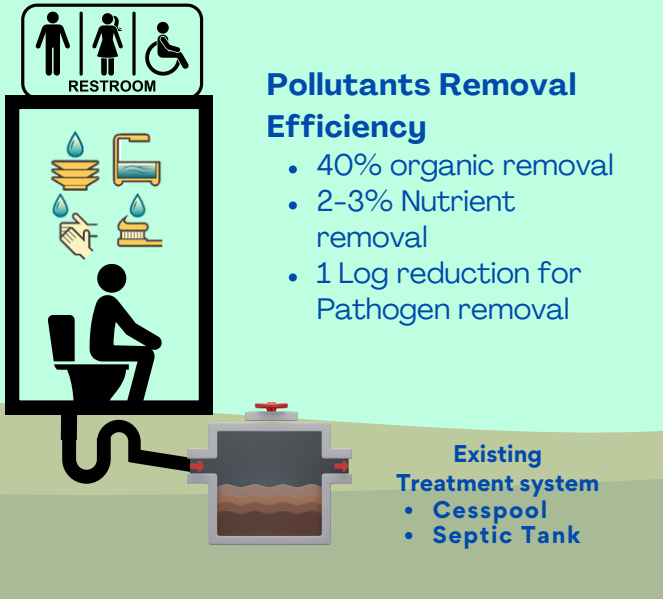
Due to wastewater generation by several anthropogenic activities (Especially Traveling and camping) within Khao Yai National Park, surface water quality within the park has been degrading. Moreover, most of the conventional treatment systems, for example, cesspools and septic tanks, in national parks are not sufficient to remove the pollutants from wastewater such as nutrients and pathogens.

Therefore, the objective of this project is to establish a small-scale tertiary treatment system by using different media with a combination of wetland systems to treat the effluents from the conventional treatment system as a post-treatment process.

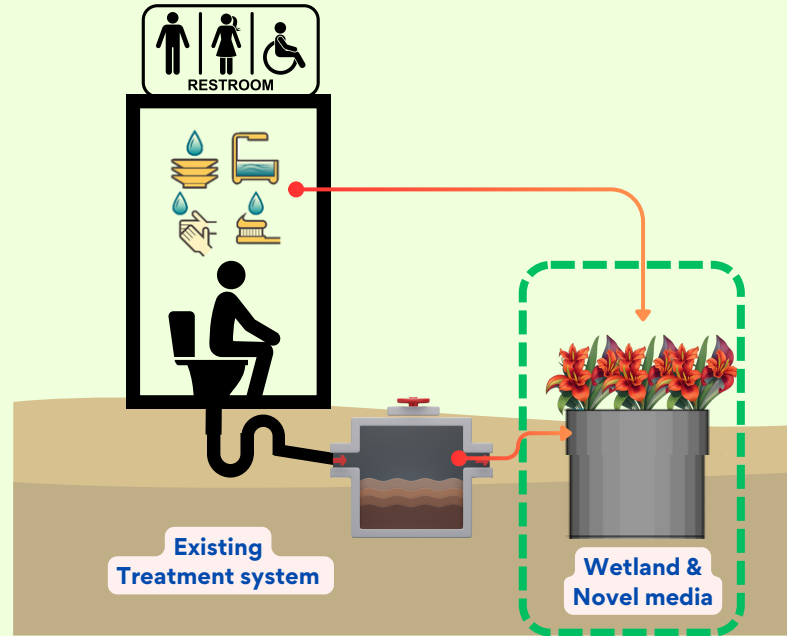


Concept of implementation of Triple-A solution

Existing Treatment system



Existing Treatment system + Constructed Wetland & Novel media



Constructed Wetland & Novel media



Plus more Removal Efficiency

- 30% org. removal
- 86% Nutrient removal
- 4-5 Log reduction

Main Principles for Pollution Removal

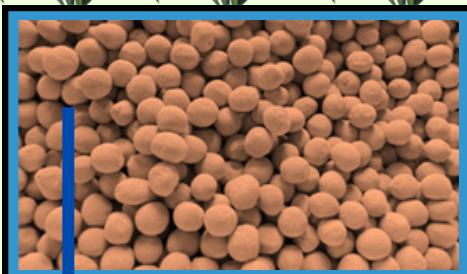
1. Filtering
2. Adsorption
3. Precipitation
4. Disinfection

Installation Cost Only

- About: **45000 Thai Baht (1255 USD)**
- Capacity: 500 L/day (10-15 people)
- Install Duration: 30 days

Note:

Not include monitor and maintenance



Canna Lily

- Cost: 75 baht/ item

Biohouse Media

- Depth: 0.50-0.60 m
- Cost: 70 baht/ kg



Adsorptive Media

- Depth: 0.10-0.20 m
- Cost: 300 baht/ kg



Drainage

- Depth: 0.30-0.60 m
- Rock Cost: 20 baht/ kg

Pilot Project Timeline of Triple-A solution

Appointment With Khao Yai National Authority

We never asked permission and discussed the pilot scale installation in the Khao Yai before, so, we are unsure and wondering How long the appointment and perimition process is. **The duration cannot mention**

Installation Triple-A's Solution

After the permission approval

- **Day 1-3:** Survey the toilet and facility in Khao Yai National Park
- **Day 4-6:** Meeting and planing
- **Day 7-9:** Equiprmend and tools preparation
- **Day 10-20:** Installation the constructed wetland and Novel media
- **Day 21-25:** System Testing
- **Day 26-30:** Final Meeting and Summary

Note: Working date does not include Holiday

Maintenances

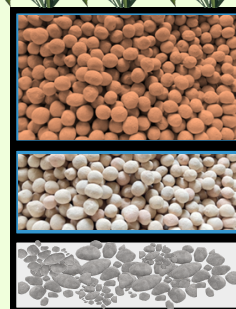
Because of the service life of novel media and Plant harvesting, so, the system maintenance should be processed every 2 months. **The duration cannot mention**

Stakeholder of Triple-A solution



Sponsor

Triple-A solution



Khao Yai National Park



NATS LAB

Technology and Technical

Triple-A Team