

Development and challenges of rural water supply in Thailand

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Pollution Control Department



Ministry of Natural Resources and Environment

Thailand

Contents

1. Introduction
2. Government policy of water supply in Thailand
3. Current status of small-scale water supply
4. Water supply improvement project
 - 1) Case of Khon Kaen Province
 - 2) Case of Chiang Mai Province

1. INTRODUCTION

Thailand

Area 513,115 sq.km

Population ~66,000,000

Capital city

■ Bangkok (Krungthep)

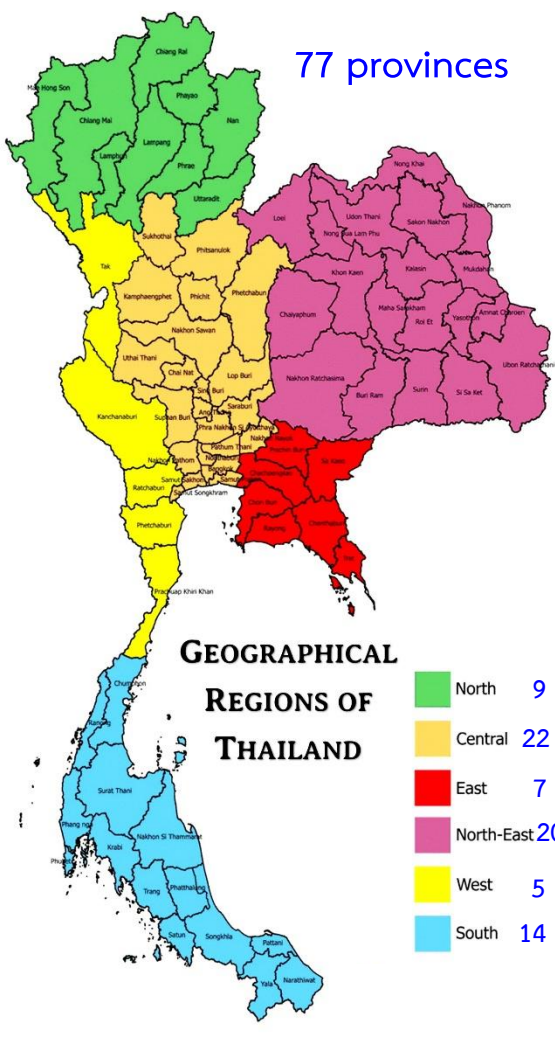
- 77 Provinces

- 878 Districts

- 7,255 Sub-districts

- 75,032 Villages





Thailand's Water Supply Agency

⇒ Metropolitan Waterworks Authority (MWA)

3 provinces (Bangkok, Nonthaburi, Samut Prakan)
 (~12.5% of country's total households)

⇒ Provincial Waterworks Authority (PWA)

Apart from MWA

74 provinces (~24.5% of country's total households)

⇒ Local Administrative Organizations (LAOs)

Apart from MWA and PWA (mostly rural water supply)
 (~52.48 % of country's total households)

Development history of rural water supply

1948 – Public Works Department, Ministry of Interior began rural water supply

1960-mid 1970s – several agencies carried out rural water supply

- Public Works Department, Ministry of Interior
- Department of Health, Ministry of Public Health
- Dept. of Mineral Resources, Ministry of Industry
- Office of Accelerated Rural Development, Ministry of Interior

1982-1992 – Dept. of Health provided training on the operation, maintenance and basic administration to village water committee members

Decentralization policy in late 1990s- either transferred to village water committee or owned and managed directly by LAOs

2. GOVERNMENT POLICY OF WATER SUPPLY AND ACTION PLAN IN THAILAND

National Water Resources Management Master Plan (2018-2037)

via newly established regulatory agency, The Office of National Water Resources

Aims - providing wider access to clean drinking water

- expansion in irrigation infrastructure and area under irrigation
- preventing flood and droughts in core economic areas

Goals - Supplying safe water to 75, 032 villages by 2030 (100 % of all villages throughout Thailand)

Core appointed agencies.

- ➡ Department of Local Administration (DLA), Ministry of Interior – coordinating & driving agency through Provincial working group on the implementation of LAOs' village(rural) water supply (began in late2021)
- ➡ Department of Water Resources, Ministry of Natural Resources and Environment
- ➡ Environment and Pollution Control Office, Pollution Control Dpt., Ministry of Natural Resources and Environment
- ➡ Department of Health, Ministry of Public Health

Environment and Pollution Control Office

Prepare a manual for managing the village water supply system

Providing a simple water quality measurement kit

Take a sample of water quality for analysis

Organize training to increase the potential of village water supply system administrators.



Department of Health

Prepare a manual for managing the village water supply system

Prepare the SOP of drinking water standards of 2020

Produce simple water quality measurement kit

Organize training to increase the potential of village water supply system administrators.



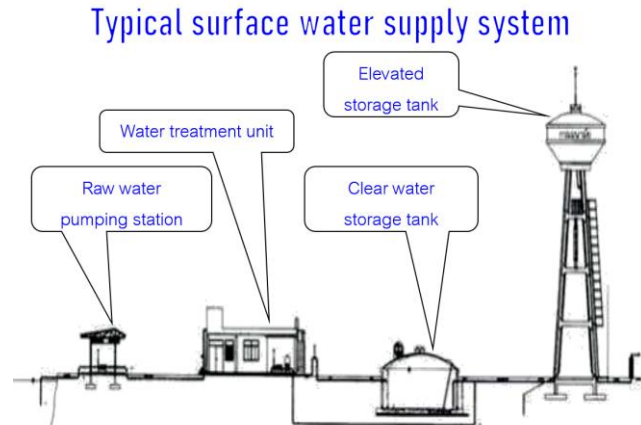
Department of Water Resources

Prepare a manual for managing the village water supply system

Prepare the SOP of quality standards for village water supply system

Formulate Model for construction of rural water treatment system

Evaluate of the village water supply system



3.Current status of rural water supply

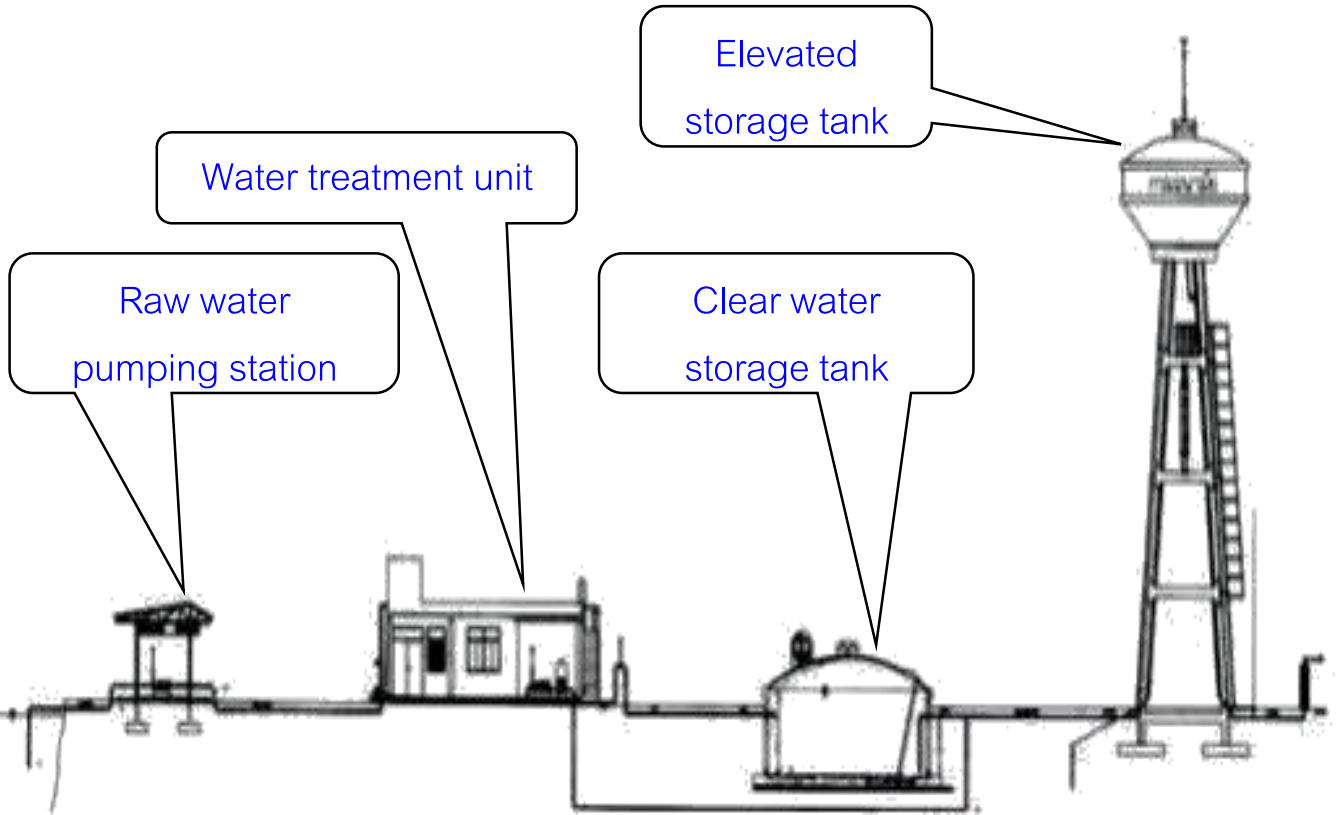
Different agencies' model for water treatment plants (and tank tower) at village level



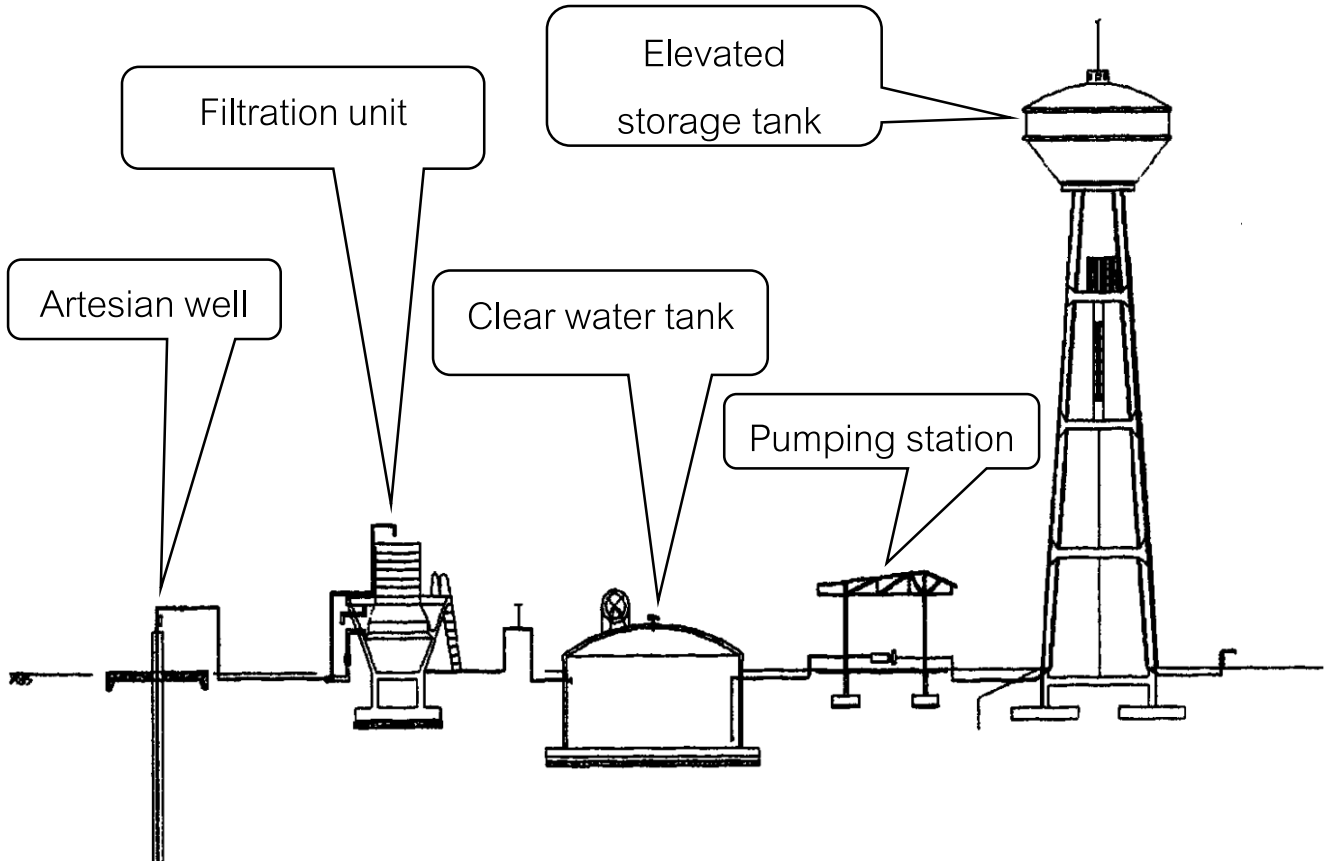
Typical surface water supply system (Department of Water Resources' Model)

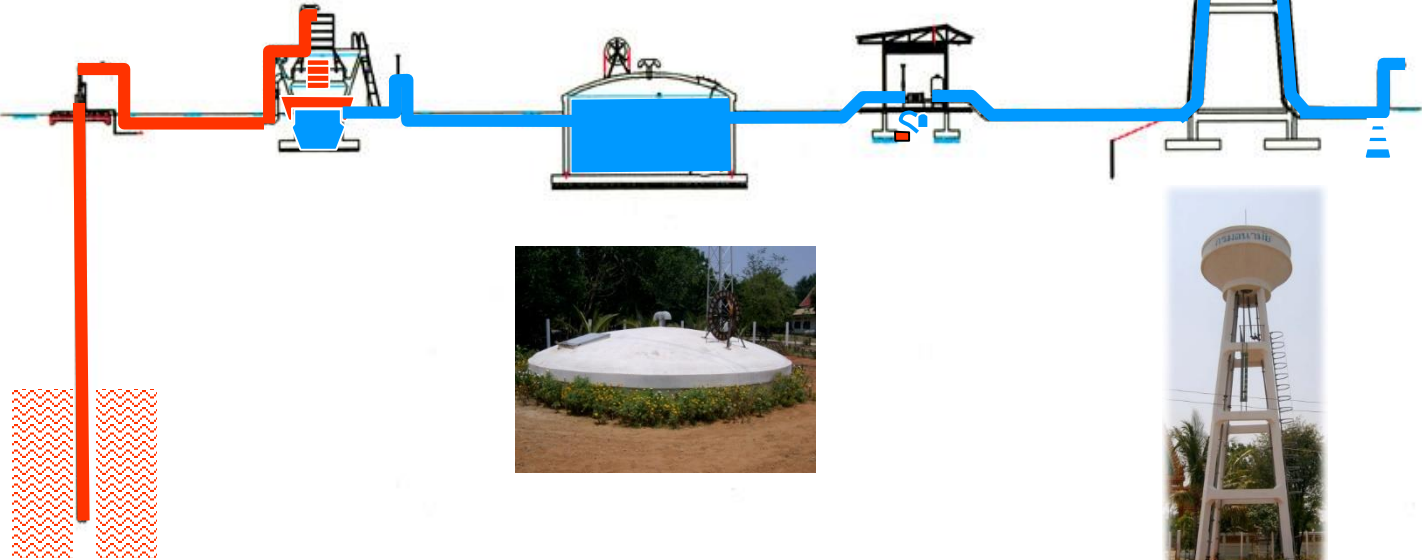
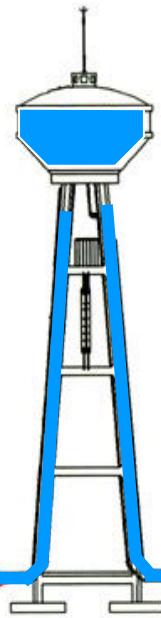


Typical surface water supply system



Typical ground water supply system





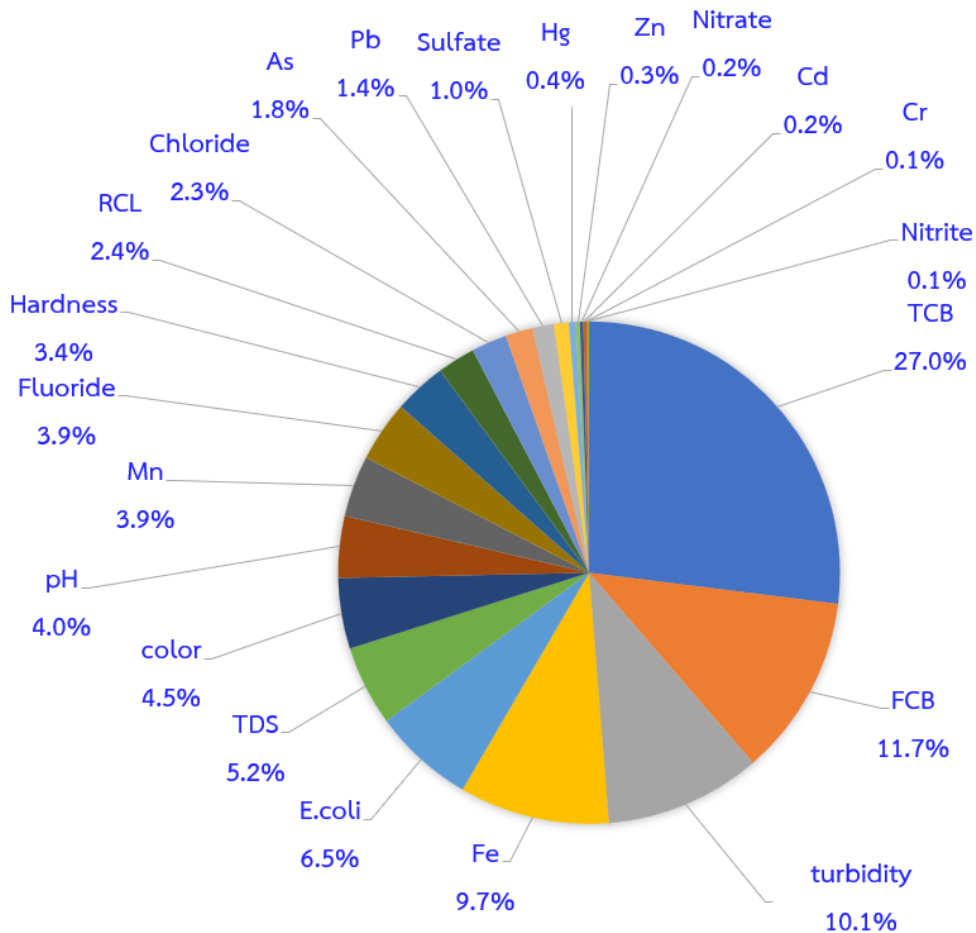


Diagram illustrating proportion of Thailand's rural water supply qualities exceeded criteria by parameters during 2018-2022

4. Rural water supply improvement project

1) Case of Khon Kaen Province

2) Case of Chiang Mai Province

1) Case of Khon Kaen Province

Problems/Challenges

- LAOs have few staffs and limited skills
- Systems either do not function properly or operate significantly below design expectation
- Inadequate technical and financial support
- Village water supply administrative committee's managerial capacity is not professional and transparent.
- Provincial working group on the implementation of LAOs' village(rural) water supply is just in the beginning stages, and tangible progress has not been achieved

Most commonly problems found

➔ Poor water quality due to disinfection(chlorination) process failure



Applied Chlorination



➡ Poor water quality due to misuse of coagulant/flocculant



➔ Process mismanagement

Financial unbalance leads to incomplete operational procedures

➔ Limited technical support



Residual Chlorine Test Kit



Water sampling-analysis

➔ Raw water constraints

Desirable raw water source



High turbidity in rainy season



Water quantity in dry season



Multi-purposes uses-contamination



Lack of regular maintenance and system clean up



2) Northern TH: Chiang Mai Case study

• Problems/Challenges

- ☞ Systems either do not function properly or operate significantly below design expectation.
- ☞ Inadequate technical and financial support as mostly of people who operate system has been change.
- ☞ People who operate systems need more training.

Water Quality Problems

TCB and E.coli



No Disinfection System

mountain water supply



Village Water Supply Model

Water Quality Problems

Poor water quality due to disinfection(chlorination) process failure



Department of Health/Department of Water Resource.



Village Water Supply Model



Provincial Waterworks Authority



Water Quality Problems → Turbidity

Maintenance Problems → Difficult to backwash

Improving Activities and the Result

1.FIELD SURVEY



2.Capacity Building for water treatment plant operators



3.Water quality sampling-analysis



4.Certification





Action plan for Integrated Water Resources Management



กรมควบคุมมลพิษ
POLLUTION CONTROL DEPARTMENT

Environment and Pollution
Control Office 1-16 (EPO. 1-16)



project performance 2018 - 2022

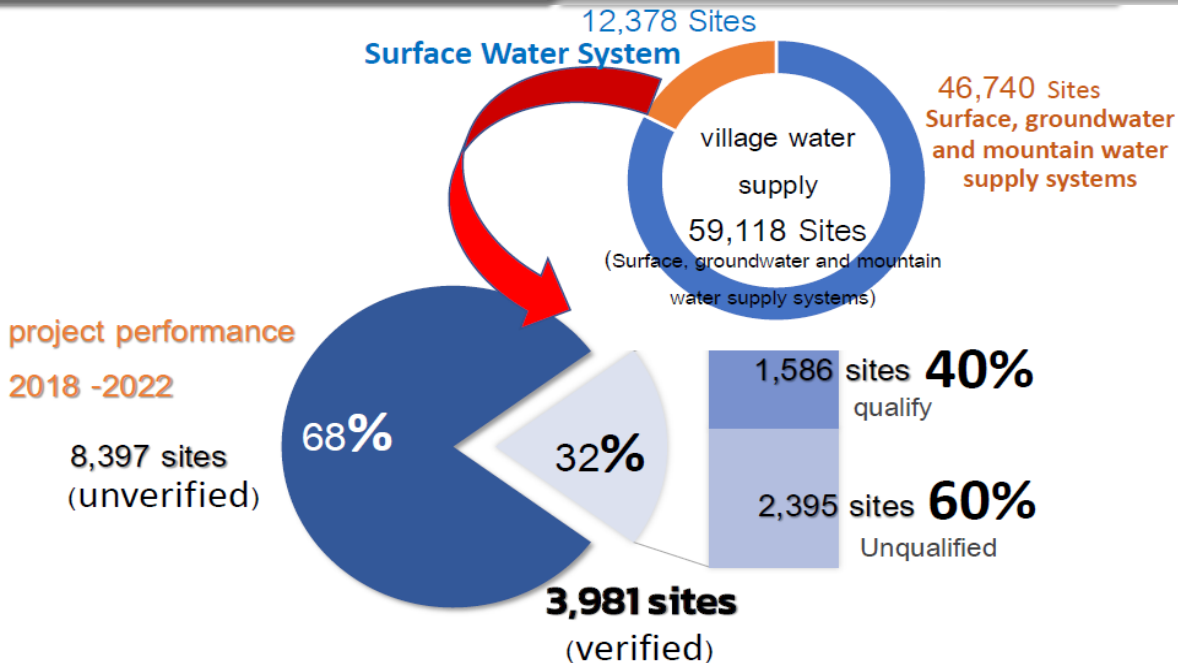
Environment and Pollution Control Office 1-16

Process

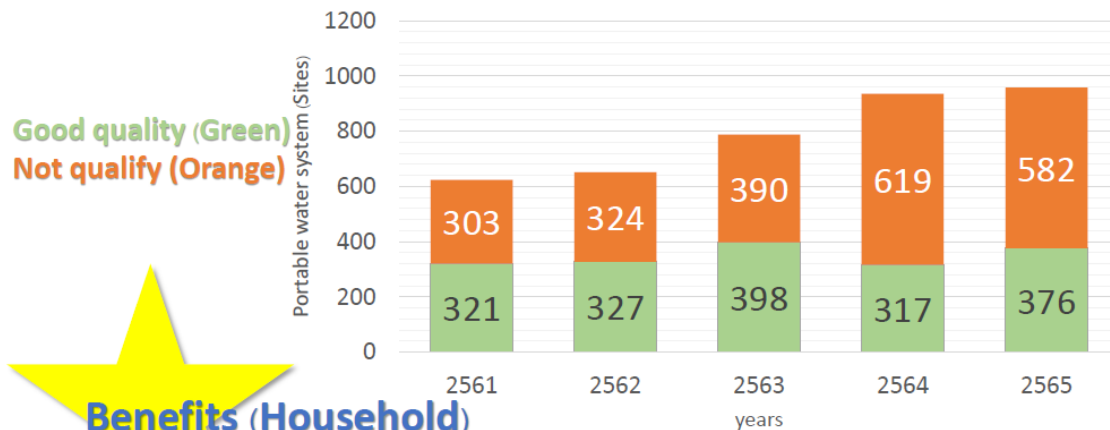
- Reservoir quality analysis for village water supply
- Water Quality Analysis village water supply
- Capacity Building
- Develop water quality analysis system

Outcome

The reservoir for the village water supply has been inspected and be conserved to provide tap water with suitable quality for consumption and consumption covering 76 provinces(all over Thailand).



Project performance 2018 –2022 Environment and Pollution Control Office 1-16



Benefits (Household)

Years	Budget (million baht)	Benefits (Household)		Percentage
		Total Household	Household with standard tap water	
2018	30.56	236,386	151,682	64.16
2019	28.71	173,301	97,330	56.16
2020	28.71	227,549	125,787	55.27
2021	27.36	127,515	106,550	83.55
2022	23.72	239,260	111,329	46.53

Action plan for Integrated Water Resources Management Environment and Pollution Control Office 1-16

To conduct survey
(8,397 sites)

To improve
(Unqualified)
(2,395 sites)

Audit Target and improvement

5 year (2023 – 2027)
(10,792 sites)

Checking and improve (EPO/year)
(135 sites/EPO/year)

Reservoir improvement model
qualify
(877 sites)

Choose a Model for village water tap
(1 District 1 system)

Target to Survey 5 years

10,792 sites

1 District 1 model

Via 4Cs

2023 Focus on tourism provinces

2024 - 2027 Every provinces



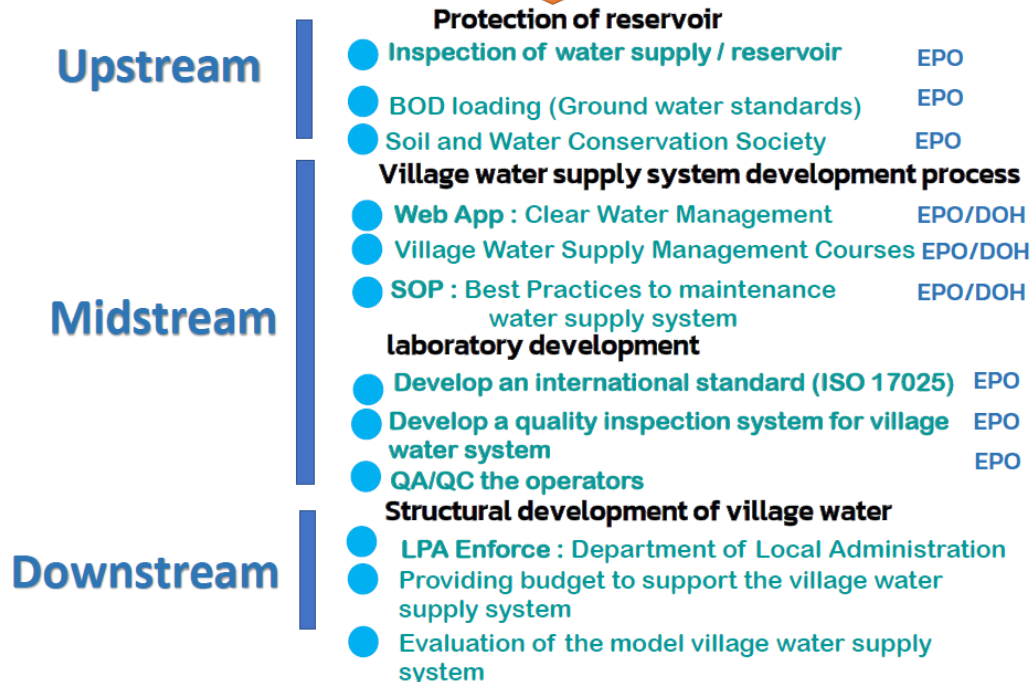
2,395 sites

The goal is to improve the clean water supply level for 5 years

Guidelines for the management of the village water supply quality system

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Improvement of village water supply systems for Department of Local Administration at the provincial level.



Criteria for access to good water quality

Conserve

The reservoir is without contaminants and contaminated chemicals and get conserved

4Cs

Chlorine

Add chlorine for disinfection and have residual chlorine at the water 0.2 – 0.5 mg/l



Clear

- The water supply system is clean and orderly according to the 5S principle.
- The water supply system qualify

Clean

Tap water produced is not turbid, colorless, no germs, with in standard for drinking water quality of the Department of Health. Ministry of Public Health



Thank you for your attention
(Sawasdee Krab)

