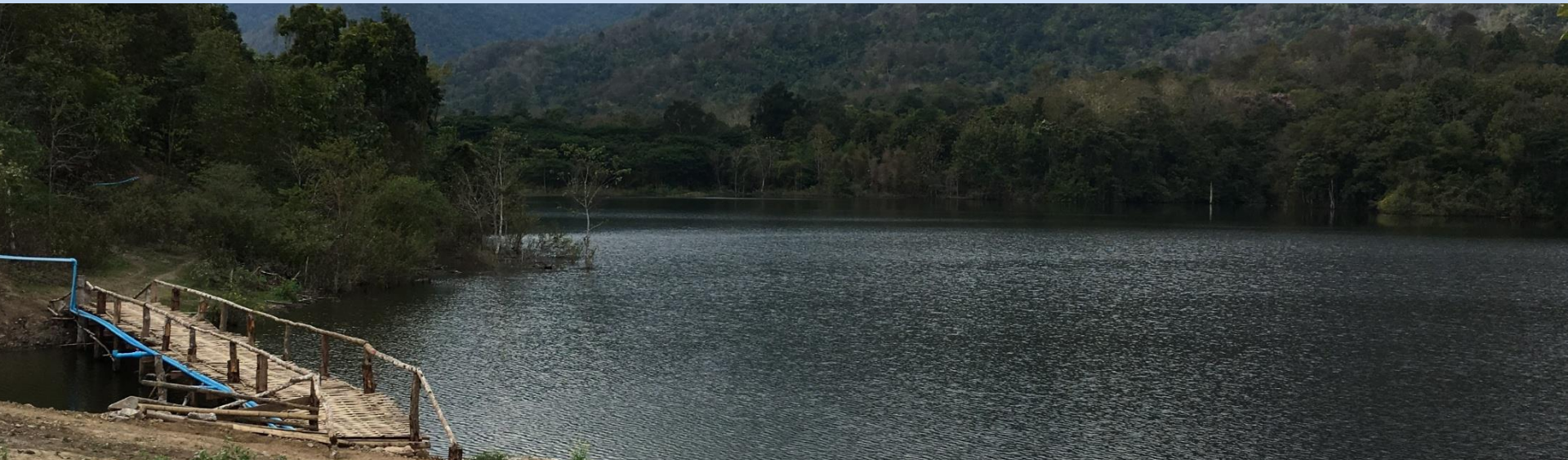


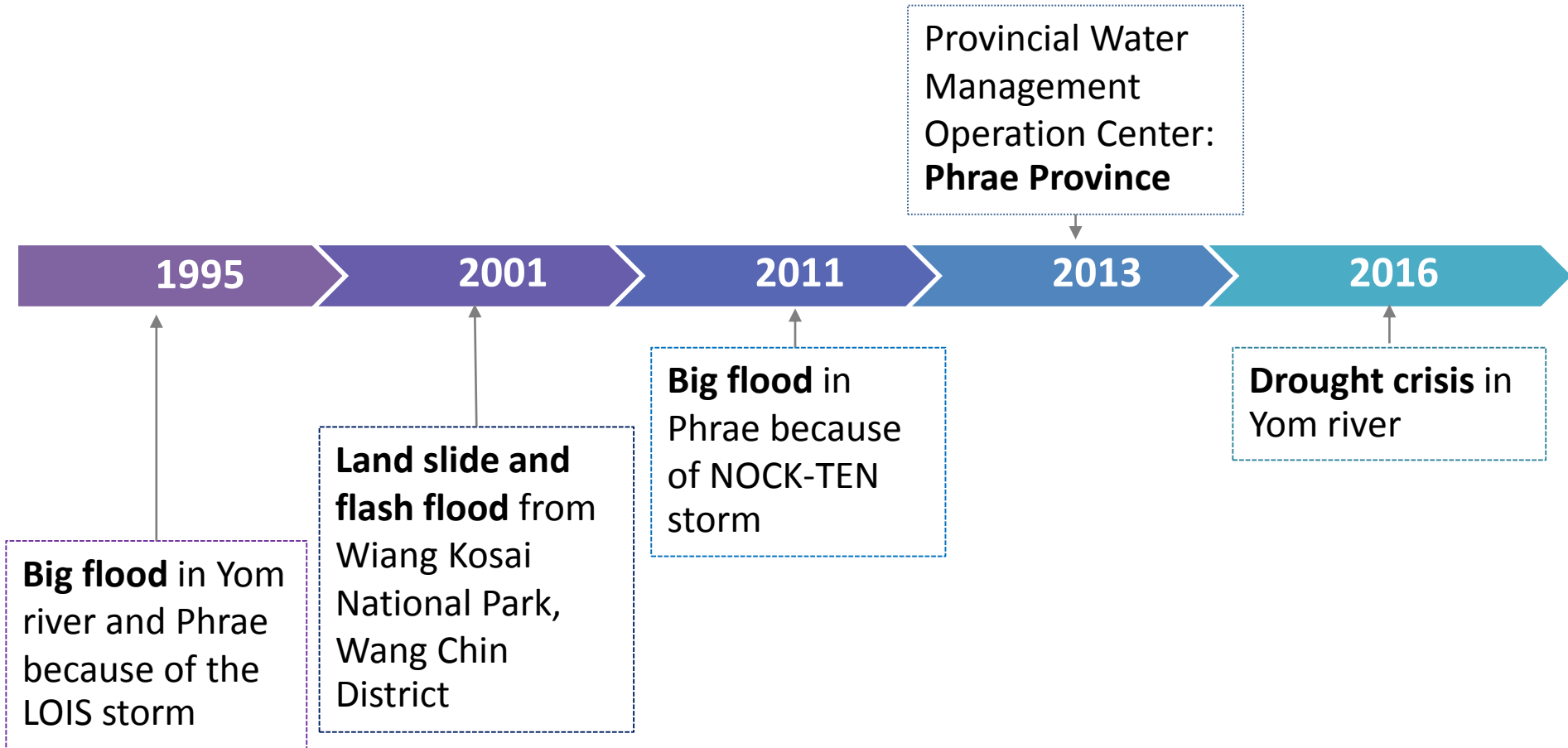


ศูนย์บริหารจัดการน้ำจังหวัดแพร่
Phrae Water Resources Management Center

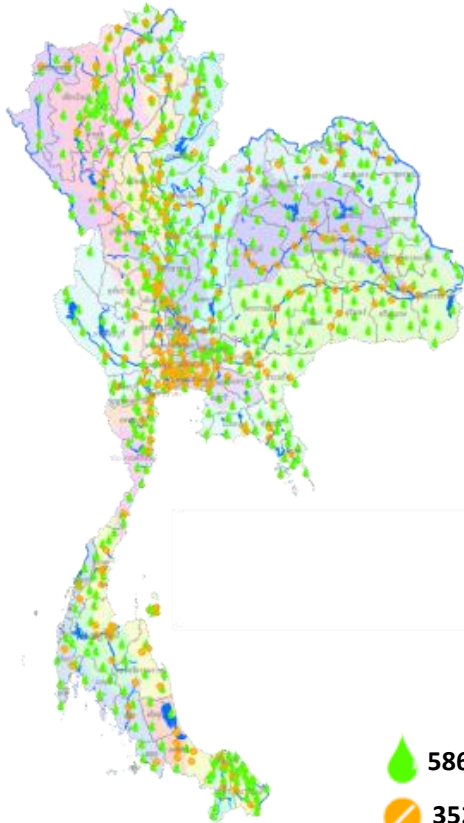
Project on Sustainable Development's City for Better Livelihood



Phrae's Situation (Past)





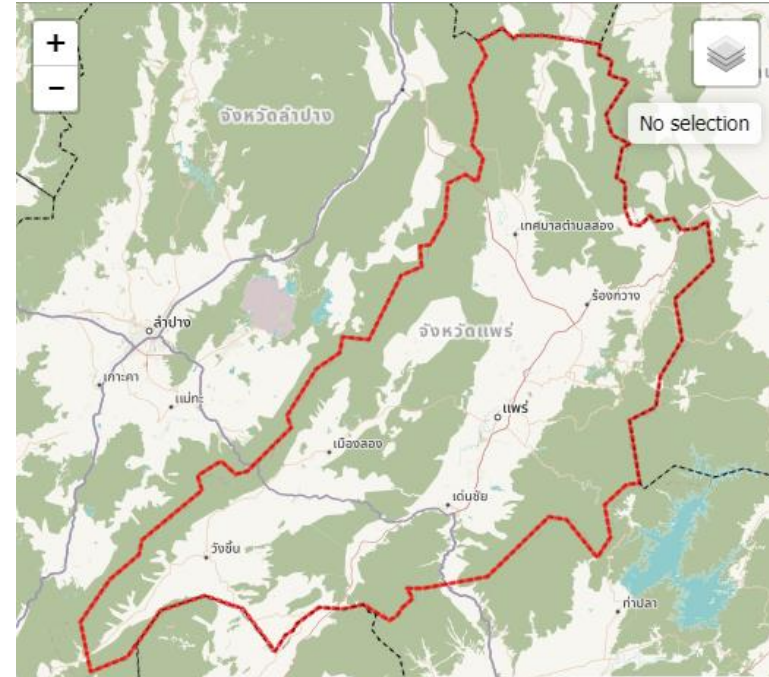
HAI's Telemetry System >> Phrae's Telemetry Stations



938

telemetry stations online
nationwide

-  586 Weather and Precipitation stations
-  352 Water Level stations



39 telemetry stations online in Phrae

- **33** Weather and Precipitation stations
- **6** Water Level stations

Provincial Water Management Operation Center: S&T for Water Management at the provincial level












Goal 13: Take urgent action to combat climate change and its impacts

Using area specific information to
monitor and manage water
situation both normal and crisis

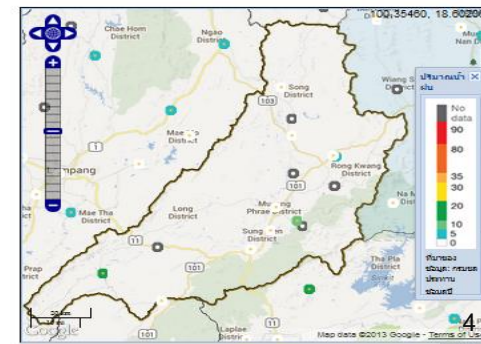


(1) ปริมาณฝน

ฝน 24 ชม.	ฝนวันนี้	ฝนล่าสุด		
สถานี	อำเภอ	ฝน (มม.) ▼	ล่าสุด	
วังชิ้น	วังชิ้น	14.6	18:00	
ขอมส	เมืองแพร่	4.6	18:00	
บ้านแมะฮวด	วังชิ้น	3.0	18:30	
บ้านแมะจอก	วังชิ้น	0.5	18:30	
บ้านหมอนคำ	เด่นชัย	0.5	18:15	
จอมทอง	จอมทอง	0.4	18:00	
บ้านแมะขมิ้น	สูงเม่น	ไม่มีฝน	19:00	
บ้านนาขุน	วังชิ้น	ไม่มีฝน	18:45	
บ้านโคกป่ากั้น	ดง	ไม่มีฝน	18:45	
บ้านทุ่งโป่งไถ	สูงเม่น	ไม่มีฝน	18:30	

* ปริมาณฝนสะสม ตลอด 24 ชม นับจากเวลาที่รวม

(2) Internet GIS



S&T Adaptation

“DSLMM” for Community Water Resource Management

DSLMM



Water Resource Management aims to create understanding of local people about their water supply, water demand, waterway in the area, sustainable management using water table, and identify source of budgeting for management

D	S	L	M	M
Water D emand	Water S upply	L ogistic of Management	Water M anagement	M oney (Budget of water)

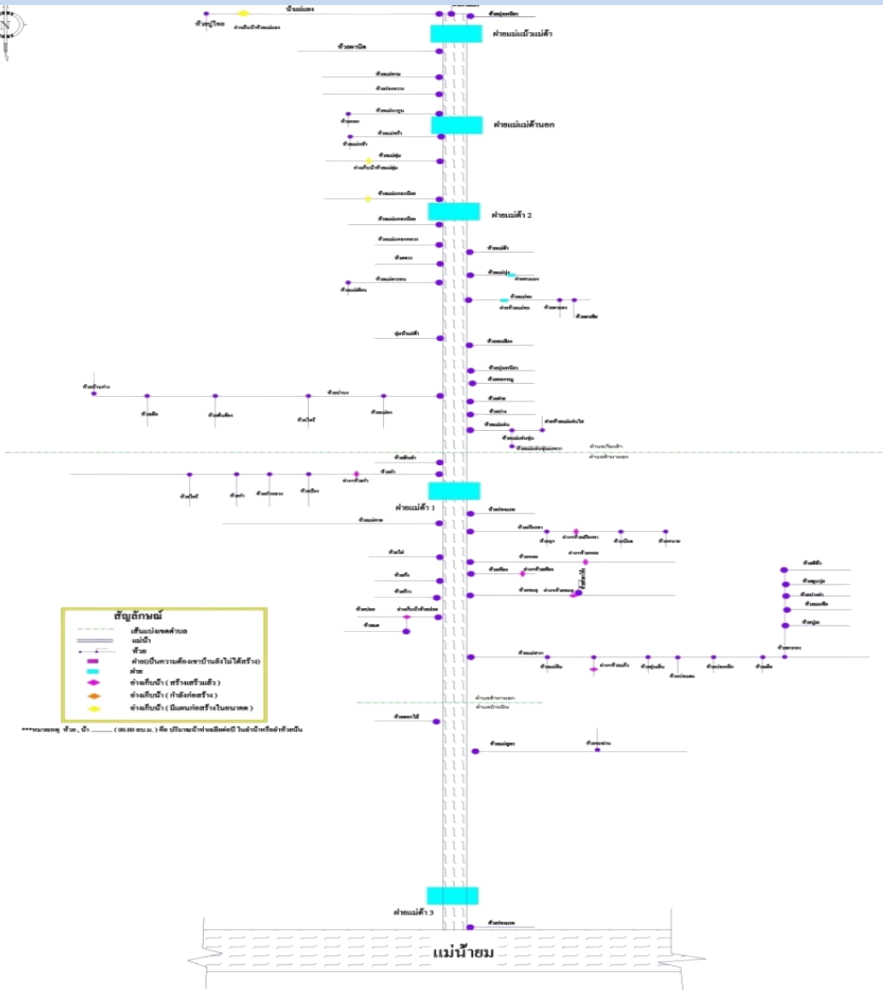
* Created by Mr.Apichat Todilokvech

Example of DSLMM in *Maeta Basin*

Located in **3 sub-districts** are;
Wiang Ta, Ta Pha Mok and Ban Pin Sub-district

Maeta Water Balance

D Demand	Water demand for agriculture and consumption 57,288,449 m ³ /year
S Supply	Runoff amount 146,000,000 m ³ /year 9 Small reservoirs contain 2,473,000 m ³ /year
L Logistic	Sub-district water diagram
M Management	Amount of water management, reserve water 54,815,449 m ³ /year
M Money	Budget planning



Sustainable Development's City: Phrae Community



Goal 2: Zero Hunger

Goal 11: Make cities inclusive, safe, resilient and sustainable

Phrae community realize that the **organic farms** **is the food bank** and very important to their health. They expand the farms to both adults and youths in the community

Organic Farms



Food Market from the Forest



Collaboration with Lao PDR

Phrae Community and Maejo University (Phrae Campus)

cooperate on agricultural techniques for clean food purposed

expand



National University of Laos (Dongdok Campus)

- Conference for social forestry
- Study visit to local forest plantation together

Maejo University transfer the Biopesticides knowledge to plant the clean food



Maejo University work with Lao PDR



Project on Sustainable Development's City for Better Livelihood

Project Area of SDGs



Goal 2: Zero Hunger



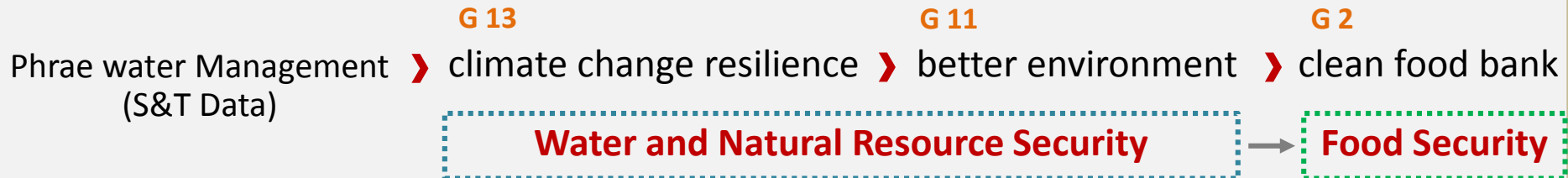
Goal 11: Make cities inclusive, safe, resilient and sustainable



Goal 13: Take urgent action to combat climate change and its impacts

Project Platforms

sustainable development for better livelihood



***Project on Sustainable Development's City
for Better Livelihood***



Goal 11:
Make cities inclusive, safe, resilient and sustainable

Phrae



Sustainable city
and community

???

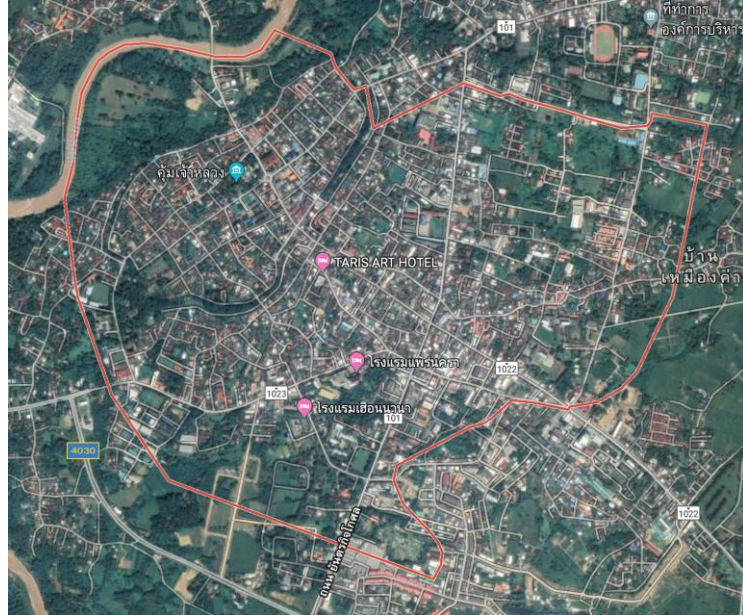
Phrae



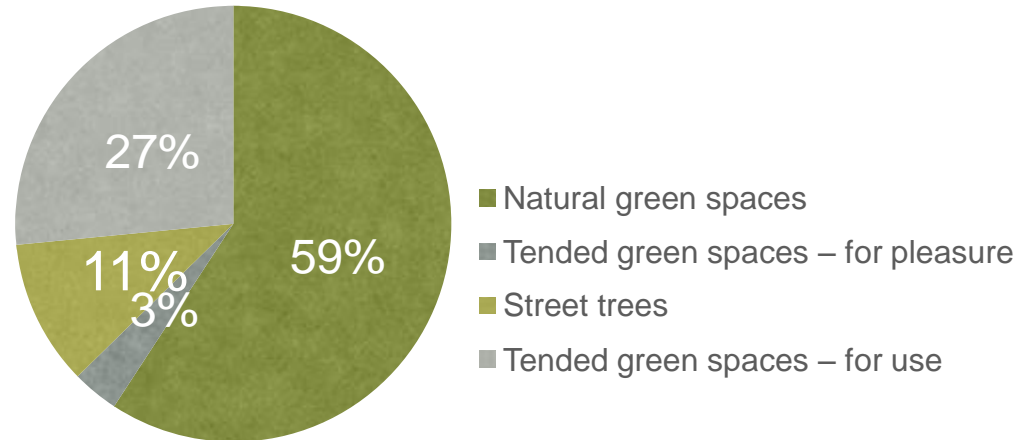
Phare
Urban
Forestry

Pilot project

Green space in Phrae municipality



Type of GS	Area / sq.m.	% of total GS	% of total area	GS / sq.m. / person
Natural GS	303,328.00	59.22	5.11	18.11
Tended GS for pleasure	17,650.00	3.45	0.30	1.05
Street trees	55,300.00	10.80	0.93	3.30
Tended GS for use	135,968.30	26.54	2.29	8.12
Total	512,246.30	100.00	8.63	30.59



Green space in Phrae municipality



Phrae Urban forestry

Project goals

- Raise public awareness about the importance of trees in the city.
- Caring and conserving trees in the city.
- Helping local agencies consider where and how to invest in green space development.
- Help assess the variety of species and detect various threats from pests and plant diseases that may occur in the province.

Phrae Urban forestry

What has been done

Phases 1: Urban forest in Phrae old city (Data collection)



What has been done



Phrae Urban forestry

What we are doing

Phases 2:

2.1 Plant guide book

2.2 Analyze the dust holding efficiency of plant species



ตารางแสดงประสิทธิภาพของพืชในการดักจับฝุ่น		
ชื่อไทย	ชื่อวิทยาศาสตร์	ประสิทธิภาพในการดักจับฝุ่น
ไม้เลื้อย		
ศรีตรังอินเดีย	Thunbergia Grandiflora (Roxb. Ex Rotter) Roxb.	***
ตีนเป็ดขาว	Quisqualis indica L.	***
แมงลัก	Antigonon leptopus Hook & Arn.	**
ผักเป็ด	Cleria Ternstroem L.	**
แมงลัก	Pennisia Volubilis L.	**
ผักเป็ด	Pasiflora foetida L.	***
ไม้พุ่ม		
ไผ่ตง	Thyrsostachys Stenostachya Gamble	***
ผักเป็ด	Begonia Spp.	**
ผักเป็ด	Leonotis Nepentifolia (L.) R.Br.	**
ไม้พุ่ม		
วาสนา	Drosera fragrans (L.) Jack	**
แก้ว	Mimosa paniculata (L.) Jack	***
พวงมณีไทย	Caesalpinia Pulcherrima (Linn.) Swartz	***
กระดังงา	Nyctanthes Arbor-Triste L.	***
ทองเือง	Tecoma Stans (L.) Kunth.	***
ไม้ม้วน	Wrightia religiosa Benth. Ex Kurz	**
กระดังงา	Syzygium Austroale (J. C. Wendl. Ex Link) B. Hyland	***
ไม้ยืนต้น		
พริก	Diopatra Bauhinia (Blume) Hem	**
ส้ม	Similia Asper Lour.	**
ไม้ม้วน	Thespesia Papilion (L.) Sol. Ex Correa	**
ผักเป็ด	Albizia lobbeck (L.) Benth.	**
ไม้เลื้อย	Senna tinctoria (DC.) H. S. Irwin & Bamesby	**
ผักเป็ด	Baccharis papyrifera (L.) Thunb. Ex Vent.	**
ผักเป็ด	Averrhoa bilimbi L.	**
ไม้ม้วน	Holoptelea pubescens (Buck-Ham.) Wall. Ex G. Don	*
ไม้ม้วน	Wrightia pubescens R. Br.	***
ผักเป็ด	Phanera Spp.	***
ไม้เลื้อย	Cassia Stamea Lamk.	**
ผักเป็ด	Muntingia calabura L.	***
ผักเป็ด	Tagetes indica Floribunda Jack	***
ผักเป็ด	Tagetes indica Speciosa (L.) Pers	***
ผักเป็ด	Tagetes indica Tomentosa C. Presl	***
ผักเป็ด	Samaranea Saman (Jacq.) Merr	***
ผักเป็ด	Spathodea Campanulata P. Beauv.	***
ผักเป็ด	Tabebuia Rosea (Benth.) Dc.	**
ผักเป็ด	Trema Orientalis (L.) Bl	**

Example of a plant guide book and a table of the dust holding efficiency of plant species

Phrae Urban forestry

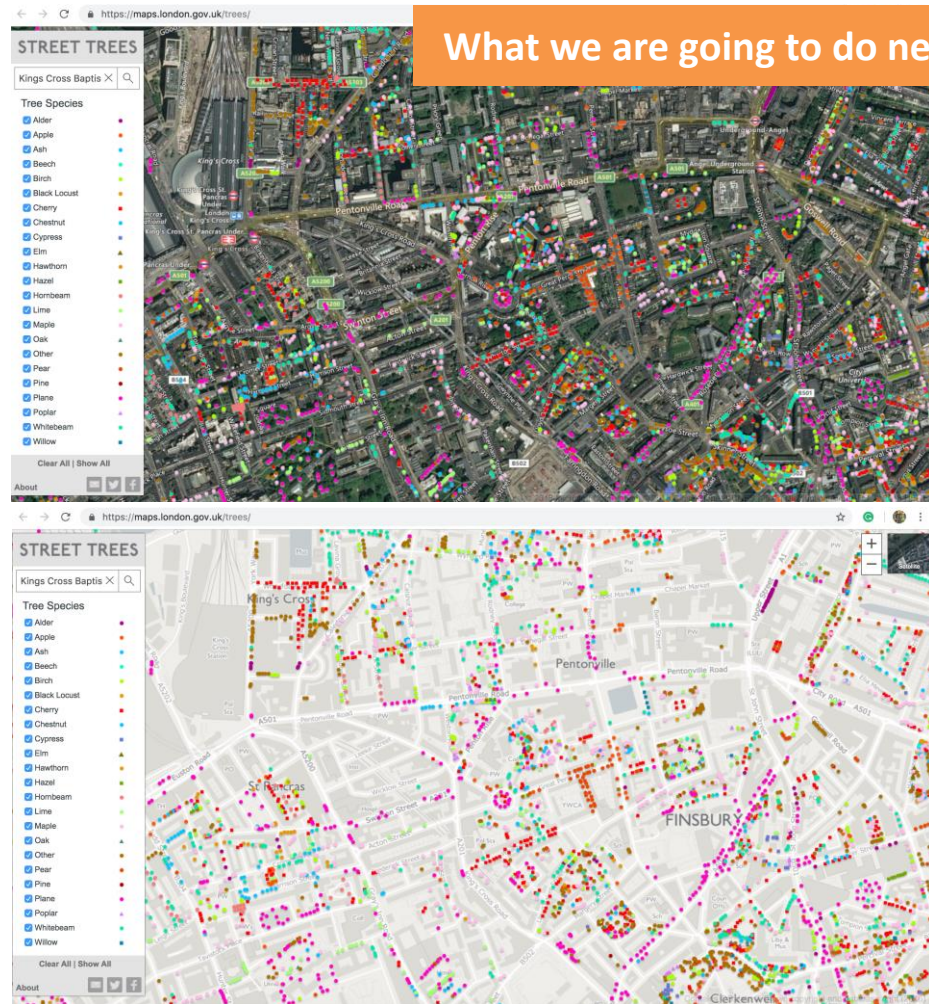
Phases 3:

3.1 Open data for everyone

- Guideline for urban design and planning

<https://maps.london.gov.uk/trees/>

What we are going to do next



Phrae Urban forestry

What we are going to do next

Phases 3:

3.2 Aesthetic and Urban landscape

- Tourist attraction
- Tourism economic



Pink trumpet, Nakornpathom



Cassia fistula, Suphanburi



Yang Na, Chiangmai

Phrae Urban forestry

Phases 3:

3.3 Urban green network

- The concept —> a city in the park.
- The park will expand to connect with various public spaces in the city, activity areas, roads, bicycles, pedestrian areas.
- The city more beautiful and benefiting from green spaces.



The Rose Fitzgerald Kennedy Greenway is a linear park located in several Downtown Boston neighborhoods.

What we are going to do next



Phrae Urban forestry

Phases 3:

3.4 Urban farming



Growing or producing food in a city or heavily populated town



Organic rooftop vegetable and herb garden on top of high-rise building in Bangkok

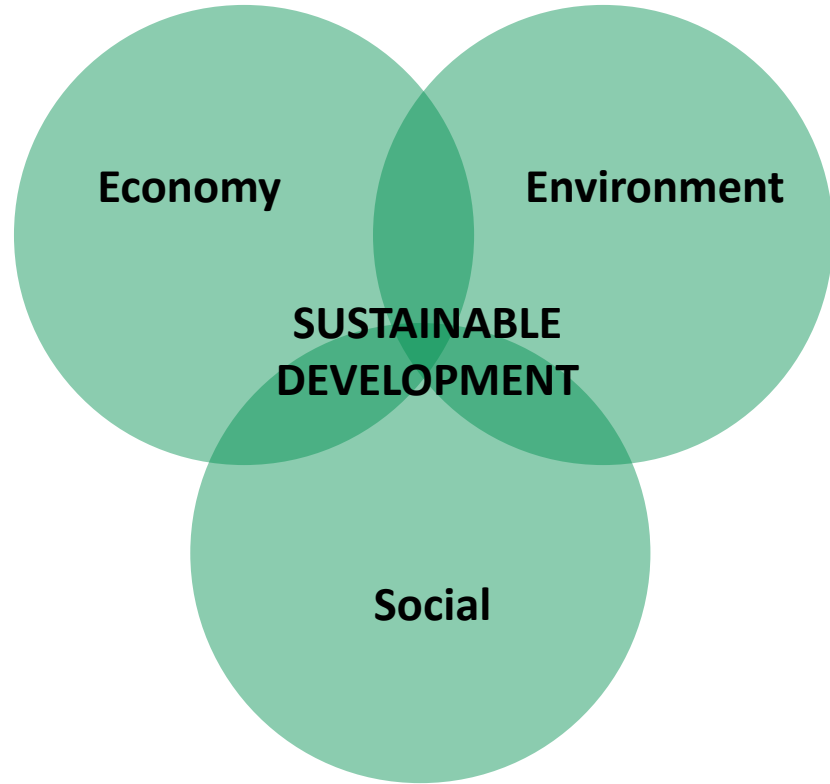


Bangkok Farmer's Market

What we are going to do next

Benefit of urban forest

- Storing carbon
- Aesthetic
- Tourism development
- Biodiversity and habitat
- Air pollution
- Better health for people
- Reduce crime



Project on Sustainable Development's City for Better Livelihood

Project Partners

Japan

The National Agricultural
Research Organization
(NARO)

+

Thailand

Hydro and Agro Informatics Institute (HAIL)

+

Phrae Community

+

Maejo University
(Phrae Campas)

+

Lao PDR

National University of Laos
(Dongdok Campas)

Project Mechanism

Knowledge Sharing

1. **learn the agricultural techniques** among NARO japan with HAIL and Phrae community Thailand at APAN-Agricultural Working Group (AgWG) Meeting*

Doing

2. To encourage Phrae community to **be the prototype of sustainable development city** for better livelihood, and local economy

Expanding

3. **Expand the knowledge to Lao PDR**, then, to ASEAN member countries.

Remark: * Currently, HAIL is the chairperson and NARO is the co-chairperson of AgWG

Project on Sustainable Development's City for Better Livelihood

Project Outcomes

- the natural and environment development for **climate changed resilience** and the better solution of **disaster risk reduction**.
- the new technology for the organic smart farms which being the clean **food security**



Project on Sustainable Development's City for Better Livelihood

Project Budget

Total budget = 15,000 USD

No.	Details	Budget (USD)
1	Knowledge Sharing at APAN – AgWG Meeting (Thai = 2 persons + Lao PDR = 2 persons) [4 persons x 1,200 USD]	4,800
2	City Development – Phrae Community	7,000
3	Knowledge Sharing with National University of Laos (Dongdok Campas)	3,200
Total		15,000