Provincial Water Management Operation Center:

Phrae Province, THAILAND
Provincial Water Management Operation Center

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

Phrae  Sukhothai  Phayao  Phichit

1. **Management** at normal and crisis conditions: Using geographical condition and infrastructure data combines with the data of water and climate from telemetering stations, and precipitation forecast for analysing water situations, monitoring and warning particular areas.

2. **Planning** Water resources development project and allocating the fiscal budget of water resources development: Using data from the system to constitutes a point and type of project at the Sub-District level to analyse watercourse with roadway routes that might obstruct water routes. Regular flooding areas can also be adapted for catchment areas (Monkey Cheeks or Kaem-Ling) such as drainage clogging or shallow waterway, which can be considered to allocate financial support to conform to terrain conditions and project density.

3. **Monitoring** Progress of Water Resources Development Project: Using the data of project position, year of fiscal expenditure allocating and operational status of projects demonstrate existing project, completed projects or long-term project.
Collaboration: HAII, National Farmers Council, and Local Administrative Organizations

**HAII**
- Technology GIS
- Sub-district water stream maps
- Data of water sources and soil series
- Data of water resource development project
- Satellite image maps ThaiCote/Google Earth
- Topographical maps and land use maps
- Informatics data analysis for final development plan

**National Farmers Council**
- Crop data
- Land use data
- Water usage data for agriculture
- Agricultural land allocation data

**Local Administrative Organization**
- Water sources/reservoir data
- Plans of water sources development project
- Data of water sources development project from local agencies

**Crop maps for appropriate agricultural planning**

**Plans of water sources development projects**

**Provincial Water Management Operation Center**

**Sustainable On Water Food Economic**
HAII supports data at **provincial** and **sub-district level**, and river basin data in areas such as economic and social **baseline data**, **water demand data**, **topographical map**, **water reservoir irrigation boundaries** and **telemetering station information**.
Phrae’s Situation (Past)

1995: Big flood in Yom river and Phrae because of the LOIS storm

2001: Land slide and flash flood from Wiang Kosai National Park, Wang Chin District

2011: Big flood in Phrae because of NOCK-TEN storm

2013: Drought crisis in Yom river

Provincial Water Management Operation Center: Phrae Province

Timeline:
- 1995: Big flood in Yom river and Phrae because of the LOIS storm
- 2001: Land slide and flash flood from Wiang Kosai National Park, Wang Chin District
- 2011: Big flood in Phrae because of NOCK-TEN storm
- 2013: Drought crisis in Yom river
In 2011, landslide and flash flood from Wiang Kosai National Park, Wang Chin District.

“there were over 800 people died from disasters, and 1 village had to be moved.”
HII’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 (Since
- 33 Weather and Precipitation stations
- 6 Water Level stations
HII’s Telemetry System  >>  Phrae’s Telemetry Stations

Data from Telemetry Station

With collaboration: Royal Irrigation Department, AIS, and HII

<table>
<thead>
<tr>
<th>Area</th>
<th>Date</th>
<th>Time</th>
<th>Solar. (W/m²)</th>
<th>Temp (°C)</th>
<th>Hum. (%RH)</th>
<th>Pres. (mBar)</th>
<th>Rain1Hr. (mm.)</th>
<th>RainToday (mm.)</th>
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In 2013

Using area specific information to monitor and manage water situation both normal and crisis.
**S&T Adaptation**

**“DSLMM” for Community Water Resource Management**

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.

<table>
<thead>
<tr>
<th>D</th>
<th>S</th>
<th>L</th>
<th>M</th>
<th>M</th>
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<tbody>
<tr>
<td><strong>Water Demand</strong></td>
<td><strong>Water Supply</strong></td>
<td><strong>Logistic of Management</strong></td>
<td><strong>Water Management</strong></td>
<td><strong>Money</strong> (Budget of water)</td>
</tr>
</tbody>
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* 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**

<table>
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<tr>
<th>D</th>
<th>Demand</th>
<th>Water demand for agriculture and consumption 57,288,449 m$^3$/year</th>
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<tr>
<td>S</td>
<td>Supply</td>
<td>Runoff amount 146,000,000 m$^3$/year</td>
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<tr>
<td></td>
<td>9 Small reservoirs contain 2,473,000 m$^3$/year</td>
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<tr>
<td>L</td>
<td>Logistic</td>
<td>Sub-district water diagram</td>
</tr>
<tr>
<td>M</td>
<td>Management</td>
<td>Amount of water management, reserve water 54,815,449 m$^3$/year</td>
</tr>
<tr>
<td>M</td>
<td>Money</td>
<td>Budget planning</td>
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</table>
Apply Science and Technology for field survey; creek, river, and gravity, to establish the water map and water chart for management.

**Development Concept: Small Reservoir Management**

1. **Watershed forestry restoration.** Checked dam to increase the soil moisture and sediment trap
2. **Reservoir development.** Renovate to increase the water capital
3. **Water distribution system.** Link the water system and distribute, and increase the ponds for water storages in the farmland

With collaboration: Provincial, Local, and Communities, and People, to expand the good practices of Mae Jua reservoir to other 160 reservoirs in Phrae.
Development Concept: Small Reservoir Management

Before

After

Present
Monitoring by Provincial Water Management Operation Center

Monitoring from NHC Mobile Application

Daily Report:
Water and Weather Situation on July 18, 2018

Local Warning via Line Application
After the disaster/monsoon, they survey the areas for the further development and prevention.

After the weather and water forecasting, the operation center and local government take action for disaster prevention.
Food Security

When Phrae can manage their water and forest, the ecology return. There are supermarket in the forest, both food and herbs. Also, there are the organic farms, that very important to their health. They expand the farms to both adults and youths in the community.

Organic Farms

Food Market from the Forest
Sustainable Development

1. Environment:
   Water and Food security

2. Economy:
   GDP, Decrease Lost, …

3. Social:
   Community Water Resource Management