

# Master Plan on Water Resource Management



Strategic Committee for Water Resource Management  
Office of the Strategic Committee for Water Resource Management  
Office of the National Economic and Social Development Board  
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## 1. Introduction

- 1.1 Water resource is vital for human living, and is essential in sustaining the environment. In recent years, Thailand has experienced frequent and severe drought and flood, which seems to continuously intensify. These extreme events have caused loss and damage to the economy by affecting agriculture, industry and community areas, with an estimation of 10 billion baht. Particularly, the great flood in 2011 has affected not only domestic, but also foreign investment. Assessed by the World Bank, the damages and losses from the 2011 flood is approximately 1.44 trillion baht.
- 1.2 Fully aware of the significant impacts from those floods, the government has set up the **Strategic Committee for Water Resource Management (SCWRM)**. Later on, the SCWRM has formulated the **Master Plan on Sustainable Water Resource Management** for both urgent and long term, in order to ensure the continuity of country's development even with future drought and flood. The SCWRM has adopted the King's initiatives and the Philosophy of Sufficiency Economy as guiding principles in drafting the Master Plan.

## 2. General Facts

- 2.1 The Chao Phraya River Basin Area consists of eight river basins including Ping, Wang, Yom, Nan, Chao Phraya, Sakaekrung, Pa Sak and Tha Chin, covering the area of 157,925 sq km. The population in this area is around 25 million people. The average annual rainfall is 1,300 mm while the average annual runoff is 33,123 million cu m. The major rivers in this river basin are Ping, Wang, Yom, Nan, Mae Klong, Pa Sak, and Tah Chin. In the northern part of the basin, the entire storage capacity is around 25,773 million cu m., while the central area can store water only 2,124 million cu m. The Chao Phraya River will not overflow as long as the speed of the water flow is not higher than 3,500 cu m. per second.
- 2.2 The main weakness and problems of water resource management in the past include (1) the degradation of watershed areas due to illegal encroachment, (2) the incompetent management of water resource and the lack of a single-commanded authority, (3) the lack of a master plan on long-term water resource management, resulting in unclear direction and continuity in budgeting support, (4) the unsystematic and outdated database, and (5) the obsolete laws and regulations relating to water resources.

### 3. Master Plan on Water Resource Management

The Master Plan on Water Resource Management consists of 8 major work plans and 2 action plans which are (1) Action Plan of Water Management for the Urgency Period and (2) Action Plan of Integrated and Sustainable Flood Mitigation in the Chao Phraya Floodplain. The details of the Plan are as follows:

#### 3.1 Rationales

The overall water resource management should be implemented at the river basin level and cover all river basins countrywide from the upstream, midstream to downstream. The management should ensure the participation of all stakeholders. The water resource management plan should be formulated for both urgent and the long-term periods in response to possible future floods. The concept of water resource management is customized to fit with each area. In the upstream area, the emphasis is on retention flood water and preventing severe runoff. In the midstream area, the focus is on water management in conjunction with water gate control and water drainage to minimize damages from flood. Finally, the downstream, the highlight is on the fast drainage of water to the sea.

**3.2 Objectives** (1) Prevent and minimize losses and damages from medium- to large-scale flood, (2) Improve the capacity of flood prevention system, urgency flood management, and increase capacity in the warning system, (3) Build confidence and stability and increase farmer, community, and national income while managing water, land and forest for sustainable utilization.

**3.3 Targets** (1) Short term: Reduction of losses and damages from the possible flood in 2012; (2) Long term: Reformation of the flood management system aiming at integrated and sustainable manners.

**3.4 The Master Plan** comprises 8 work plans and implements guidelines as follows:

3.4.1 **Work Plan for Restoration and Conservation of Forest and Ecosystem** aiming to restore watershed forest where water is retained, to develop additional water reservoirs according to the capacity of the areas and to develop land usage plans, that fit with its local and socio-geographical conditions by restoring and conserving the degraded watershed areas, developing projects for soil and water conservation by promoting economic and community afforestation while rehabilitating mangrove forest, improving water and land usage, increasing storage capacity, and revising and drafting relevant laws.

3.4.2 **Work Plan for Management of Major Water Reservoirs and Formulation of the National Annual Water Management Plan** aiming to prevent and alleviate impacts from possible floods in the future by developing water

management plans of major dams and river basins, formulating water management plans under different scenarios, improving the Rule Curve in water management that balance water use in several sectors, and presenting water related information to the public.

- 3.4.3 **Work Plan for Restoration and Efficiency Improvement of Current and Planned Physical Structures** aiming to prevent and mitigate the impact of flood by implementing 4 sub-work plans including (1) renovating dikes, water control buildings, and water drainage systems to ensure effectiveness in every areas, (2) improving drainage water ways, dredging canals, removing barriers in canals and draining water ways, (3) increasing efficiency in management of water draining and overflowing in specific areas, and (4) reinforcing dikes and following the King's initiatives. In the long term, several measures will be implemented, including the construction of flood ways or water diverting channels, and preventive dikes for key economic areas, as well as land use planning.
- 3.4.4 **Work Plan for Information Warehouse as well as Forecasting and Disaster Warning System** aiming at developing data system, creating hypothetical scenarios based on technical principles, setting up water management institutions, and increasing the efficiency in the warning system by (1) setting up the national water information center, (2) constructing hypothetical water scenarios, forecasting and disaster warning systems, (3) enhancing the national disaster warning system to be capable of monitoring and analyzing water situation in a timely manner by improving and increasing the number of water monitoring stations in major rivers, installing CCTVs at the water gates and pumping stations, upgrading satellite and remote sensing systems, and reorganizing and developing disaster warning systems.
- 3.4.5 **Work Plan for Preparedness to Emergency Situation in Specific Areas** aiming to build capacity in prevention and mitigation of impacts from floods by developing the systems of flood prevention and mitigation in the important areas such as agriculture, industry, and dense community, creating the system for negotiating with the affected parties, constructing warehouses for tools, and assessing the impacts of private prevention systems.
- 3.4.6 **Work Plan for Assigning Water Retention Areas and Recovery Measures** by assigning water retention areas in the upper and lower Chao Phraya River basins, developing the water retention areas to slow down water flow during flash floods, formulating a plan for diverting water into water

retention areas whilst creating measures for special compensation to those areas assigned to be water retention areas.

3.4.7 **Work Plan for Improving Water Management Institutions** aiming at setting up integrated water management organizations, as a single command authority that can make prompt decisions during the crisis and is responsible for planning, monitoring and evaluation, revising rules and regulations. For the urgency period, this single command authority is the Ad Hoc Committee chaired by the Prime Minister or the assigned Deputy Prime Minister and comprises ministers and permanent secretaries of related ministries as members. In the long term, the national integrated water management agency should be set up permanently.

3.4.8 **Work Plan for Creating Understanding, Acceptance, and Participation in Large Scale Flood Management from all Stakeholders.** Government and development partners would call for collaboration with community and people in managing impacts from floods and other major disasters.

**3.5 Action Plan of Water Management for the Urgency Period** in response to the possible future flood in 2012. The key principle of the Action Plan of Water Management for the Urgency Period is to reduce losses and damages due to flood, and to minimize the economic and social impacts. There are 6 main work plans:

3.5.1 **Work Plan for Management of Major Water Reservoirs and Formulation of the National Annual Water Management Plan** aims to improve the efficiency of the country's water management system and the main dams and to increase capacity in annual flood prevention and mitigation by assigning the Royal Irrigation Department to develop the 2012 National Major Water Reservoirs and Water Management Plan. The progress should be reported to SCWRM in January 2012.

3.5.2 **Work Plan for Restoration and Efficiency Improvement of Current and Planned Physical Structures** aims to prevent and mitigate the impact of flood by renovating, improving and preparing existing buildings, physical structures and instruments to be ready for efficient usage. These physical structures include water control buildings, dikes, water drainage systems such as pipes, canals, water gates, and pumping stations. The priority should be set on basing significant areas, risks and technical considerations. The budgetary framework is 12,610.34 and 4,515.7 million baht in 2012 and 2013, respectively. The Sub-Committee on Planning and Mitigation Measures for the Urgency Period, is responsible for this work plan, and is expected to finalize the projects within January 2012.

- 3.5.3 **Work Plan for Information Warehouse, Forecasting and Disaster Warning System** aims to formulate a development plan of unified water information warehouse for water management, a development plan of a water model and system, and also a development of a plan effective and accurate in disaster warning system accessible by local agencies and communities. For the urgency period, there are three major development plans that should be formulated as follows: (1) a development plan for and setting up the national water information warehouse (2) a plan for improving water forecasting, and (3) a plan for upgrading the national disaster warning system. This work plan is responsible by Dr Plodprasop Suraswadi and the Royal Irrigation Department, with the budgetary framework of around 4,500 million baht, and is expected to be completed in March 2012.
- 3.5.4 **Work Plan for Response to Specific Area** aims to restore and redevelop critical areas, such as communities, industrial estates, cultural heritage sites or overall significant areas like Chao Phraya River Basin, to be capable of flood prevention, mitigation, in preparation for the impacts of flood. The implementation of this work plan should integrate the Response to Specific Area with the improvement of the disaster prevention and mitigation plan by the Department of Disaster Prevention and Mitigation (DDPM). The Ministry of Interior, the Ministry of Natural Resources and Environment, and the Ministry of Defense are responsible for this work plan with the budgetary framework of 1,000 million baht. The work is expected to be completed in March 2012.
- 3.5.5 **Work Plan for Assigning Water Retention Areas and Recovery Measures** aims to mitigate the impacts of flood, to support the water management plan in the Chao Phraya River flood plains, Bangkok and its vicinity, to systematically adjust the agricultural production and land use in water retention areas, and to provide proper assistance to affected groups in water retention areas. This work plan should integrate the Work Plan for Assigning Water Retention Areas with compensation and recovery measures. The Ministry of Agriculture and Cooperatives is the main responsible agency, and the work plan is to be completed in March 2012.
- 3.5.6 **Work Plan for Improving Water Management Institutions** aims to set up the integrated water management organizations as a single command authority that can make decisions promptly during the crisis. The proposed plan for improving water management institution should also set up a task force for monitoring the progress of action plan for flood alleviation during the urgency period. The Office of the Council of State shall take full

responsibility in improving water management institution by the end of January, 2012.

(See more details on Attachment 1)

**3.6 Action Plan of Integrated and Sustainable Flood Mitigation in Chao Phraya River Basin** in which the upper stream, mid stream and downstream of the river basin is taken into account. The action plan for upper stream/river basin therefore, should focus on slowing down the velocity of the current while the lower and last stages of the river basin should focus on restoration and drainage respectively. The beginning of Action Plan of Integrated and Sustainable Flood Mitigation in Chao Phraya River Basin will be in 2012 onwards with total amount of the budget at 300 billion baht. The Action Plan comprises 8 work plans as follows:

- 3.6.1 **Work Plan for Restoration and Conservation of Forest and Ecosystem** aims to restore watershed forests along the river basin where water is retained, to develop additional water reservoirs according to capacity of the areas, and to develop land usage plan that fits with its socio-geographical conditions. The proposed projects are the improvement and conservation of soil in the upper river basin by reforestation and rehabilitation of forest areas, construction of check dams and reservoirs in the Ping, Wang, Yom, Nan, Sakaekrung, Tha Chin and Pa Sak river basins. The total amount of project cost is 60 billion baht under the full responsibility of the Ministry of Natural Resources and Environment and the Ministry of Agriculture and Cooperatives.
- 3.6.2 **Work Plan for Management of Major Water Reservoirs and Formulation of Water Management** aims to improve the efficiency of the country's water management system and main dams along with increasing capacity in annual flood prevention and mitigation. In addition, the development of water management plan for major water reservoirs, water management in various scenarios, and dissemination of water related information to the public is essential. The responsible entities in this regard are the Royal Irrigation Department of and the Electricity Generation Authority of Thailand.
- 3.6.3 **Work Plan for Restoration and Efficiency Improvement of Current and Planned Physical Structures** aims to prevent and mitigate the impact of flood by renovating, improving and preparing existing buildings, physical structures and instruments to be ready for efficient use. The example of proposed projects or activities are such as improving the water dikes, reservoir, water drainage in all areas, removing barriers in canal and waterway, and enhancing the capacity of water drainage system in risked

areas (commercial, industrial and community areas). The total amount of implementing budget for this work plan is 177 billion baht. The Ministry of Agriculture and Cooperatives, the Ministry of Natural Resources and Environment, the Ministry of Interior, the Ministry of Transportation and Communications, and the Ministry of the Prime Minister are the main responsible agencies of this work plan.

- 3.6.4 **Work Plan for Information Warehouse and Forecasting and Disaster Warning System** aims to provide necessary information in water management and to create an efficient disaster warning system as well as to establish the united disaster warning entity. The proposed plan comprises 3 activities which are (1) formulating a plan for developing information warehouse and setting up the national information center, (2) formulating a plan for improving the forecasting system, and (3) formulating a plan for improving the warning system and installing CCTV, water gates, and a central control room. The total amount of implementing budget for this work plan is 3 billion baht under the responsibility of the Ministry of the Prime Minister.
- 3.6.5 **Work Plan for Response to Specific Area** aims at building the capacity in prevention and mitigation of impacts from flood by developing the systems of flood prevention and mitigation in the important areas. The work plan comprises 9 activities including (1) developing the system of flood prevention in the important areas, (2) formulating negotiation process with flood victims/communities, (3) setting up the system of instrument warehouse, (4) analyzing the impact of water prevention system implemented by the private sector, (5) preparing the transportation during flood, (6) treating waste water due to flooding, (7) improving the related municipal laws and code of laws, (8) formulating plan of assistance and recovery of flood victims both during and after flood situations, and practicing the drill according to the flood responsive plan with all parties, (9) setting up infrastructure standard for building up the capacity in flood prevention and protection. The responsible body for this work plan is the Ministry of Interior and the Ministry of Transportation and Communications
- 3.6.6 **Work Plan for Assigning Water Retention Areas and Recovery Measures** aims to mitigate the impacts from flood, to support the water management plan in Chao Phraya River flood plain, Bangkok and its vicinity, and to provide proper and systematic assistance to victims in water retention areas. The proposed action plan is under the responsibility of the Ministry of Agriculture and Cooperatives, the Ministry of Natural



Resources and Environment, and the Ministry of Interior with total amount of implementing budget of 60 billion baht.

- 3.6.7 **Work Plan for Improving Water Management Institutions** aims at setting up the integrated water management organizations as a permanent single command authority that can make fast decisions during the crisis with all related agency involved. The Office of the Prime Minister should take full responsibility for this work plan together with related agencies.
- 3.6.8 **Work Plan for Creating Understanding, Acceptance, and Participation in Large Scale Flood Management from all Stakeholders.** Government and other development partners should call for collaboration with the community and people in managing impacts from floods and other major disasters by creating an opportunity for people and community to take part in water management via setting up a water management organization in targeted areas, training volunteers within the community for acting as a medium between the public sector and community. The Office of the Prime Minister takes responsibility for this work plan together with related agencies.

(See more details on Attachment 2)

## Action Plan of Water Management for the Urgency Period

| Work plan  | Fiscal year 2012 (m฿)   | Fiscal year 2013 (m฿) | Time frame                            | Authorities in charge   |
|--|---|-----------------------|---------------------------------------|---|
| 1. Work Plan for Management of Major Water Reservoirs and Formulation of Water Management  | -   | -                     | Report progress to SCWRM by Jan. 2012 | <b>Main:</b> RID<br><b>Support:</b> EGAT, TMD, LAO, Sub-committee for Monitoring and Analysing Trends of Water Situation, and SCWRM                         |
| 2. Work Plan for Restoration and Efficiency Improvement of Current and Planned Physical Structures <ul style="list-style-type: none"> <li>- Renovation of dikes, dams, check dams and water drainage system for capacity increasing</li> <li>- Renovation of water drainage channel, digging canals, clearing canals and water drainage channels</li> <li>- Increasing capacity in water drainage and water run-off management</li> <li>- Strengthening dikes and carrying tasks recommended by King's initiative</li> </ul> | 12,610.34<br><br>7,062.82<br><br>1,695.27<br><br>2,984.05<br><br>868.20 | 4,515.70              | Projects finalised by Jan. 2012       | <b>Main :</b> Subcommittee on Short-term Plan and Measures,<br><b>Support:</b> RID, HD, RRD, MD, MOI, BMA and SRT   |
| 3. Work Plan for Information Warehouse, Forecasting and Disaster Warning System <ul style="list-style-type: none"> <li>- Formulate Data Bank Plan/ Set-up National Data Centre</li> <li>- Formulate Forecasting System Upgrading Plan</li> <li>- Formulate Warning System Development Plan including Setting up CCTV System</li> <li>- Set up Water-Gate Remote Controlling System and Control Room</li> </ul>   | 4,500   |                       | Mar. 2012                             | <b>Main:</b> Dr Prodprasop Suraswadi and. RID<br><b>Support</b> MST, RTSD, RID, MOI, MNE, MI, Faculty of Engineering (CU), BMA, JICA and Dr Royol Chitradon |
| 4. Work Plan for Response to Specific Area <ul style="list-style-type: none"> <li>- Develop flood protection system in important areas</li> </ul>  | 1,000   | -                     | Mar. 2012                             | <b>Main</b> MOI, MoST, MoNRE, and MOD<br><b>Support:</b> MI, BMA, LAO, and communities in risk  |

| Work plan   | Fiscal year<br>2012<br>(m฿) | Fiscal year<br>2013<br>(m฿) | Time<br>frame | Authorities in charge   |
|---|-----------------------------|-----------------------------|---------------|---|
| <ul style="list-style-type: none"> <li>- Set up tool storing system</li> <li>- Formulate evacuation plan in case of flooding</li> <li>- Formulate plan for tackling polluted water from flood</li> <li>- Formulate plan for rehabilitation effected people</li> <li>- etc.</li> </ul>   |                             |                             |               | areas   |
| <p><b>5. Work Plan for Assigning Water Retention Areas and Recovery Measures</b></p> <ul style="list-style-type: none"> <li>- Identify monkey cheek reservoirs in upper and lower Chao Phraya Water Basin</li> <li>- Formulate plan for channelling water to monkey cheek reservoirs</li> <li>- Identify measures of compensation to effected people</li> </ul>       | -                           | -                           | Mar. 2012     | <b>Main</b> MOAC<br><b>Support:</b> MOI   |
| <p><b>6. Work Plan for Improving Water Management Institutions</b></p> <ul style="list-style-type: none"> <li>- Arrange meeting between SCWRM and SCRFD to propose work plan for revising organization for water management</li> <li>- Set up ask force committee to monitor operation according to Action Plan of Water Management for the Urgency Period</li> </ul> | -                           | -                           | Jan. 2012     | <b>Main</b> OCS<br><b>Support:</b> SCWRM SCRFD, MOI, MOAC, MoNRE, MOT, and OSCWRM . |
| <b>Total</b>  | <b>18,110.34</b>            | <b>4,515.70</b>             |               |   |

## Action Plan of Integrated and Sustainable Flood Mitigation in Chao Phraya River Basin

| Work plan   | Budget (m ฿) | Time frame   | Authorities in charge          |
|---|--------------|--------------|--------------------------------|
| <p><b>1. Work Plan for Restoration and Conservation of Forest and Ecosystem</b></p> <p>Sample projects;</p> <ul style="list-style-type: none"> <li>- Soil improvement and conservation in the upper river basin by reforestation and rehabilitation of forest areas in the river basin in Ping, Wang, Yom, Nan, Sakae Krung, Tha-Chin and Pa Sak</li> <li>- Reservoir construction in Yom, Sakae Krung, Nan, and Pa Sak water basin</li> </ul>  | 60,000       | 2012 onwards | MoNRE, MOAC, RID               |
| <p><b>2. Work Plan for Management of Major Water Reservoirs and Formulation of Water Management</b></p> <ul style="list-style-type: none"> <li>- Formulation of water management plan in major dams and water management in various scenarios, as well as dissemination related information to the public</li> </ul>  | -            | 2012 onwards | RID and EGAT                   |
| <p><b>3. Work Plan for Restoration and Efficiency Improvement of Current and Planned Physical Structures</b></p> <p>Sample projects;</p> <ul style="list-style-type: none"> <li>- Construction of flood ways or water channels roads, and dams and improvement of water dike, reservoir, water drainage and water gateway in order to deviate waters from Pa Sak and Chao-Praya rivers to the East or East and West efficiently.</li> <li>- Land use zoning and land utilization including setting up area protection system.</li> <li>- Improvement of quality of water in the main water channels and the remaining dikes.</li> </ul> | 177,000      | 2012 onwards | MOAC, MOI, MoNRE, MOT, and OPM |
| <p><b>4. Work Plan for Information Warehouse and Forecasting and Disaster Warning System</b></p> <p>Sample project;</p> <p>Establishment of the database system, forecasting system, and warning system as well as setting up the institution, rules and regulations and enhancing the public participation.</p>  | 3,000        | 2012 onwards | OPM                            |
| <p><b>5. Work Plan for Response to Specific Area</b></p> <ul style="list-style-type: none"> <li>- develop the system of flood prevention and mitigation in the important areas</li> <li>- set up the system of instrument and tool warehouse</li> <li>- negotiation with flood affected communities</li> <li>- treatment of polluted water due to flooding</li> </ul>   | -            | 2012 onwards | MOI, MOAC, MoNRE, and MOT      |
| <p><b>6. Work Plan for Selecting Water Retention Areas and Recovery Measures</b></p> <p>Project example</p> <ul style="list-style-type: none"> <li>- Improving/adapting irrigated agricultural areas into retention areas (Monkey cheek reservoirs) of around 2 million rai to be able to grow second rice crop comprising of irrigated agricultural areas in</li> </ul>  | 60,000       | 2012 onwards | MOAC, MoNRE, and MOI           |

| Work plan   | Budget<br>(m ฿) | Time<br>frame | Authorities<br>in charge |
|---|-----------------|---------------|--------------------------|
| Phitsanulok, Ramsar Site and Greater Chao-Praya Project.  |                 |               |                          |
| <b>7 Work Plan for Improving Water Management Institutions</b><br>- setting up the Task Force Committee for action plan management during urgency period.<br>- setting up permanent integrated water management organizations.  | -               | 2012 onwards  | OPM and related agencies |
| <b>8. Work Plan for Creating Understanding, Acceptance, and Participation in Large Scale Flood Management from all Stakeholders.</b><br>- Increasing public awareness of the progress in water management carried out by the public sector as well as encouraging people participation on water management. | -               | 2012 onwards  | OPM and related agencies |
| <b>Total</b>  | <b>300,000</b>  |               |                          |

**\*Notes**

RID = Royal Irrigation Department

EGAT = Electric Generation Authority of Thailand

TMD = Thai Meteorological Department

MOI = Ministry of Interior

MI = Ministry of Industry

MOAC = Ministry of Agriculture and Cooperatives

MoNRE = Ministry of Natural resources and Environment

MoST = Ministry of Science and Technology.

MOD = Ministry of Defence

MOT = Ministry of Transportation and Communication

OPM = Office of the Prime Minister

RTSD = Royal Thai Survey Department.

LAO = Local Authority Organization

SCWRM = Strategic Committee for Water Resource Management

OSCWRM = Office of Strategic Committee for Water Resource Management

SCRFD = Strategic Committee for Reconstruction and Future Development

BMA = Bangkok Metropolitan Administration

SRT = State Railways of Thailand

HD = Highways Department

RRD = Rural Roads Department.

MD = Marine Department

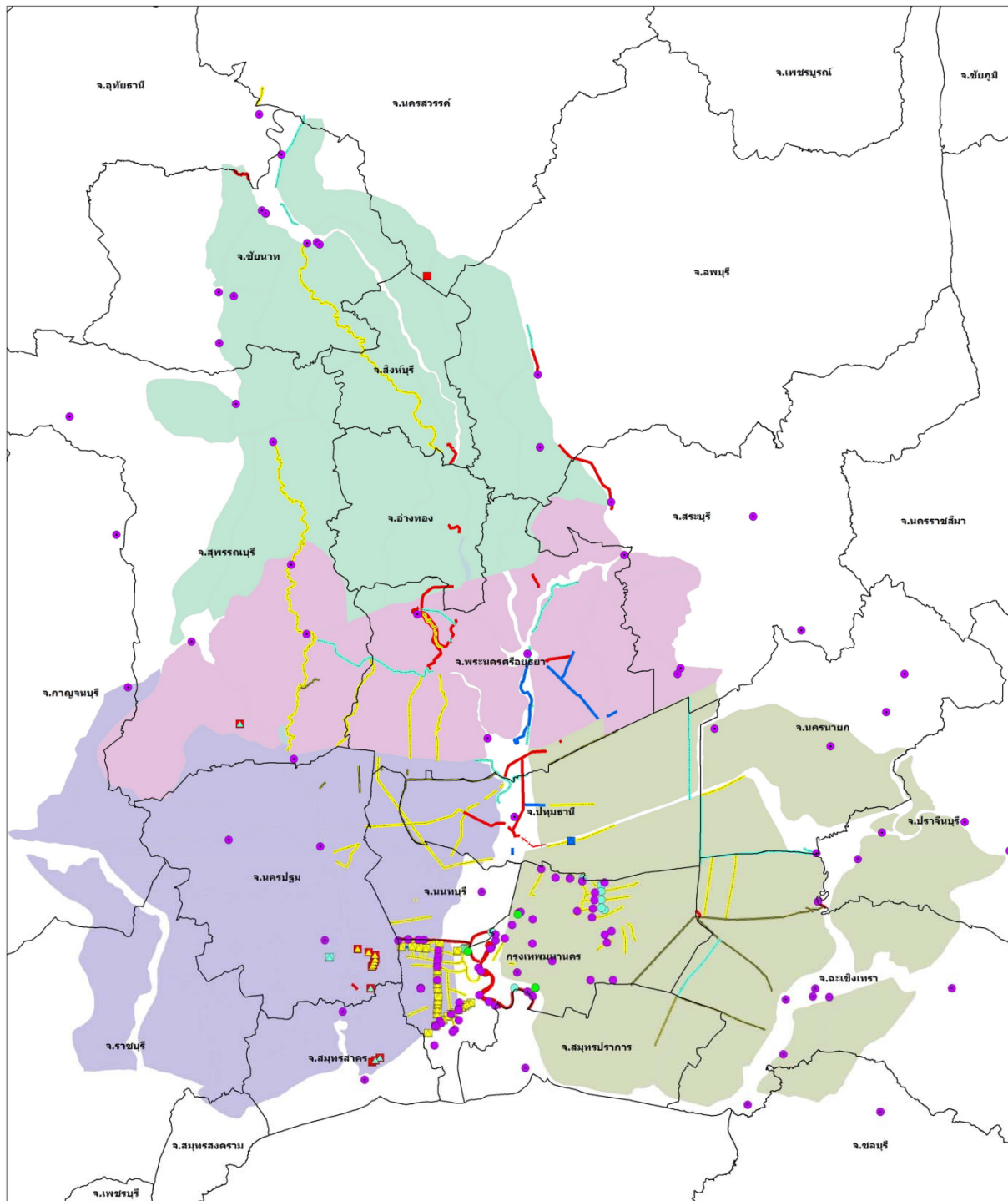
OCS = Office of the Council of the State







# แผนที่แสดงตำแหน่งที่ตั้งโครงการ



**สัญลักษณ์**

- หน่วยงานดำเนินการ**
- กรุงเทพมหานคร
  - ▲ กรมทางหลวง
  - กรมชลประทาน

**ประเภทกิจกรรม**

- งานติดตั้งเครื่องผลักดันน้ำ เครื่องสูบน้ำ และเครื่องวัดการไหลของน้ำ
- งานก่อสร้าง และเสริมคันกั้นน้ำ
- งานขุดลอกคลอง และทางระบายน้ำ
- งานซ่อมแซม รั้วกั้น และบุรณะ

- งานปรับปรุงท่านกั้นน้ำ ประตูระบายน้ำ และสถานีสูบน้ำ
- งานยกระดับคันทาง ผิวทาง ทางเท้า และสะพาน
- งานวางท่อระบายน้ำ
- งานกำจัดวัชพืช

**พื้นที่รับน้ำ**

- zone 0
  - zone 1
  - zone 2
  - zone 3
  - zone 4
  - zone 5
- สถานีโทรมาตร
- แนวเขตจังหวัด

0 5 10 20 30 Kilometers



