Annual Report
2018

Department of Water Resources
Ministry of Natural Resources and Environment

Preface

Department of Water Resources (DWR), Ministry of Natural Resources and Environment, has vital tasks in Integrated Water Resources Management (IWRM) emphasizing on the public participation of the people in the area to raise public awareness in the equitable and sustainable use of water resources. It consistently serves organization's vision which aims to promote Integrated River Basin Management (IRBM) with the participation from all stakeholders based on good governance for achieving stability, prosperity, and sustainability. These are consistent to DWR's missions; to provide policies, plans, laws, and measures regarding water resources in management, development, conservation, rehabilitation as well as control, supervision, coordination, monitoring and evaluation and solving water-related problems.

In 2018, DWR has carried out many important projects, especially in the implementation following DWR's Strategic Plan on the development of IWRM mechanisms through public participation, the conservation, rehabilitation and development of water resources in order to supply water sources and optimize water distribution as well as to develop of early warning system for natural hazards. DWR also responds to critical policies of the government which aim to improve people's well-being, water problem-solving should be addressed by developing a solar-powered water distribution system. It can relieve droughts and provides low-cost and convenient ways for plant cultivation for households' consumption and make incomes which could increase people's well-being. People very satisfy with these missions.

DWR promotes public participation by organizing many activities such as World Water World, National Water Week, National River and Canal Conservation and Development Day. These events aim to raise public awareness of the importance of water resources, the promotion of joint conservation on the abundance of water resources as well as the conservation of water resources in various water sources sustainably.

This 2018 Annual Report presents stories, statistics and the overall performances in the fiscal year 2018 which would be provided to all government agencies, institutions, public organizations and other related organizations for acknowledgment of DWR's achievements in the missions of water resources management.

Content

Part 1

Organization Profile

Overview

VISION

"The society has water security with sustainability of natural balance"

MISSIONS

The missions according to Ministerial Regulation on the Administrative Organization of the Department of Water Resources, Ministry of Natural Resources and Environment B.E 2545 (2002) are as follows;

The missions of the Department of Water Resources concerning suggestions on formulating policy and plan as well as measures relating to water resources, management, development, conservation, rehabilitation including surveillance, cooperation, follow-up, evaluation and also problem solving regarding the water resources, academic development, standardization and technology transfer at overall and river basin levels in order to sustainably manage the water resources with integrity.

MANDATES

1. Formulate policies and plans, strengthen cooperation and systematically integrate the water resources management at the national and international levels
2. Promote, support and enhance capacity for organization driven process and river basin network
3. Conserve, rehabilitate, develop, increase efficiency and maintain the balanced ecosystem of water sources and watershed areas
4. Develop knowledge and information system, formulate standard for integrated water resources management and early warning system to be applied to all sectors as well as support the water development

STRATEGIES

1. Develop mechanism for integrated water resources management with participation from all sectors
2. Conserve, develop and rehabilitate water resources and wetlands in order to provide water budget and increase water retention and drainage efficiency including maintain the balance of ecosystem
3. Develop, install and increase the efficiency of surveillance and warning system for natural disaster to tackle the climate change

WORK PLANS

1. Government personnel work plan
2. Primary work plans on water resources management and creating environmentally-friendly growth for sustainable development
3. Integrated water resources management work plans

TARGETS

Government Personnel Work Plan

1. Government operating expenditure

Primary work plans on water resources management and creating environmentally-friendly growth for sustainable development

1. Create mechanisms for integrated water resources management with participation of all sectors
2. Enhance the storage capacity of natural water sources and renovate the building and constructions as well as improve the existing water sources to be used efficiently
3. Monitor and provide warning for flood and landslides

Integrated water resources management work plans

1. Conserve, develop and rehabilitate water resources to become the sources of water budget and enhance the capacity of water distribution in order to solve flood and drought problems
2. Promote and enhance efficiency of the river basin organizations as well as develop the core water resources management system

OUTPUT

Output 1 : Increasing capacity of mechanisms for water resources management

Output 2 : Wetland conservation, rehabilitation and development including water resources management

Output 3 : Increasing the efficiency of forecasting and warning system for water disaster

Relation Diagram

The 20-year National Strategy (2018-2037)

Strategy 5 : Eco-friendly development and growth
(Key development guideline no. 5(2) : Creating eco-friendly water, energy, and agricultural security by enhancing productivity of an entire water system to promote water-use efficiency and generate value added for water consumption up to par with international standards)

The 12th National Economic and Social Development Plan (2017-2021)

Strategy 4 : Environmentally-Friendly Growth for Sustainable Development
(Target 2: Building water security and managing both surface and underground water resources efficiently)
(Indicator 2.2 : Twenty-five main watersheds have water resources management plans that take into account the balance between water demand and supply. More importantly, these plans should be put into action.)
(Indicator 2.4 : Efficiency of water usage in both the production and consumption sectors are increased.)

The 20-year Strategic Plan for the Ministry of Natural Resources and Environment (2017-2036)

Vision: The main organization in the management of sustainable natural resources and environment by participating to ensure a better quality of life
Strategy 2: Water Management

Vision Department of Water Resources

"The society has water security with sustainability of natural balance"

Mandate Department of Water Resources

1. Formulate policies and plans, strengthen cooperation and systematically integrated water resources management at the national and international levels
2. Promote, support and enhance capacity for organization driven process and river basin network
3. Conserve, rehabilitate, develop, increase efficiency and maintain the balanced ecosystem of water sources and watershed areas
4. Develop knowledge and information system, formulate standard for integrated water resources management and early warning system to be applied

Work Plan Department of Water Resources	Government Personnel Work Plan	Primary work plans on water resources management and creating environmentally-friendly growth for sustainable development			Integrated water resources management work plans	
Target Department of Water Resources	Government operating expenditure	Creating mechanisms for integrated water resources management with participation of all sectors	Enhancing the storage capacity of natural water sources and renovating the building and constructions as well as improving the existing water sources to be used efficiently	Monitoring and warning for flood and landslides	Conserving, developing and rehabilitating water resources to become the sources of water budget and enhancing the capacity of water distribu-tion in order to solve flood and drought problems	Promoting and enhancing the efficiency of the river basin organizations as well as develop the core water resources management system
Indicator Department of Water Resources	Government operating expenditure	1) 15 tools and mechanisms for water resources management 2) Tools and mechanisms for water resources management are utilized more than 80 percent.	1) 22 of water sources are developed and improved to enhance its capacity and maintenance. 2) 485 households have received benefits from developing, improving, optimizing and maintaining the water resources..	1) 1,546 villages has enhanced the capacity of the early warning and maintenance. 2) The public has received the early warning information in a timely manner when the flood occurs.	1) 388 of water sources have been conserved and rehabilitated.	1) Implementing the integrated water resources management plans for 25 river basins 2) Developing the efficiency of decision support system database for 1 system
Outputs/Projects Department of Water Resources	Output 1 : Government operating expenditure	Output 1 : Increasing capacity of mechanisms for water resources management	Output2 : Wetland conservation, rehabilitationand development including water resources	Output3 : Increasing the efficiency of forecasting and warning system for water disaster	Project no. 1 : The project of water resources conservation, rehabilitation and development	Project no. 2 : The project of developing mechanisms for water resources management at all level

Executives

Mr. Worasart Apaipong

Director General

Mr. Bhadol Thavornkitcharat

Deputy Director General

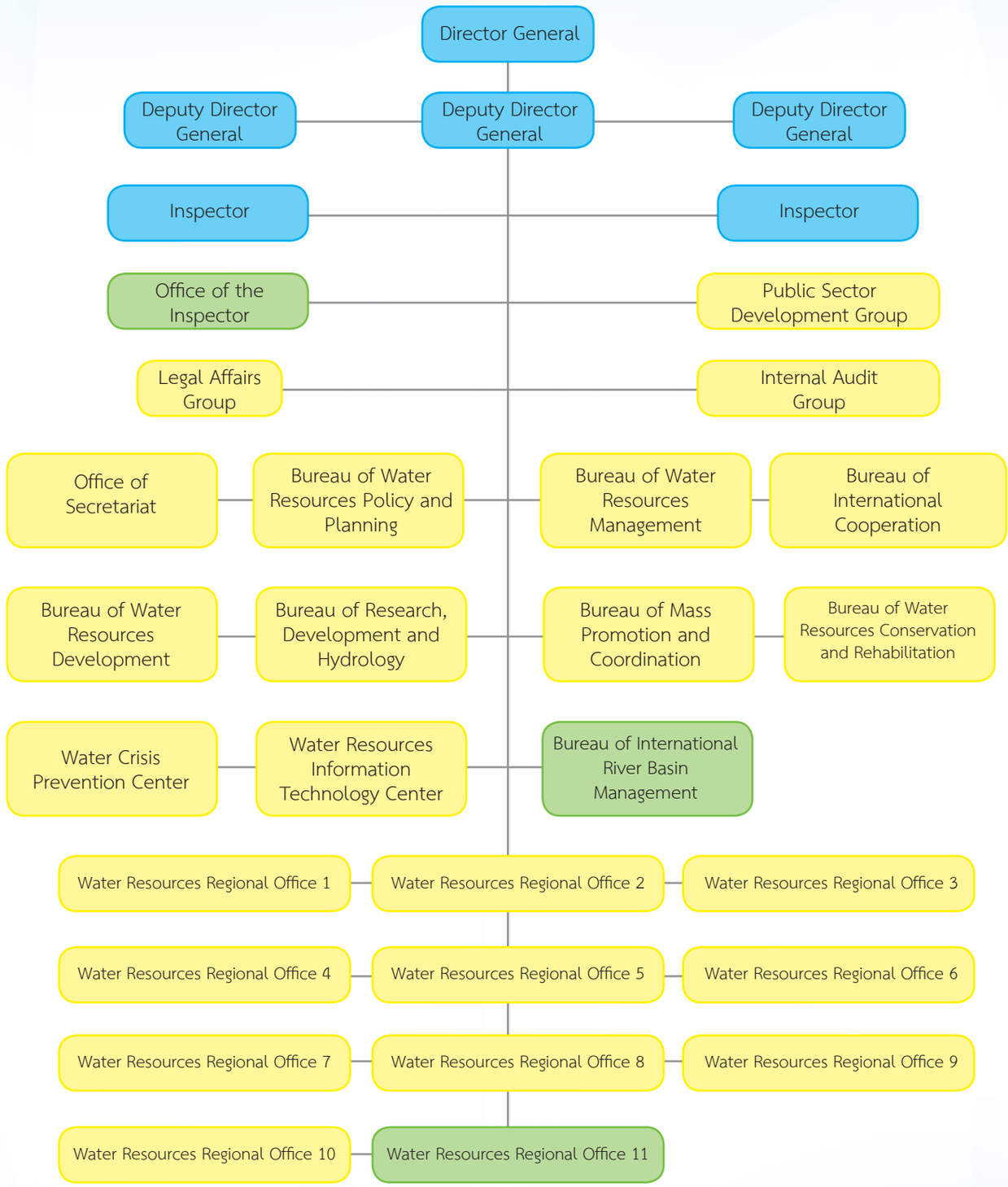
Mr. Somnuk Sookchaoy

Deputy Director General

Mr.Suntiporn Nimkingratana

Deputy Director General

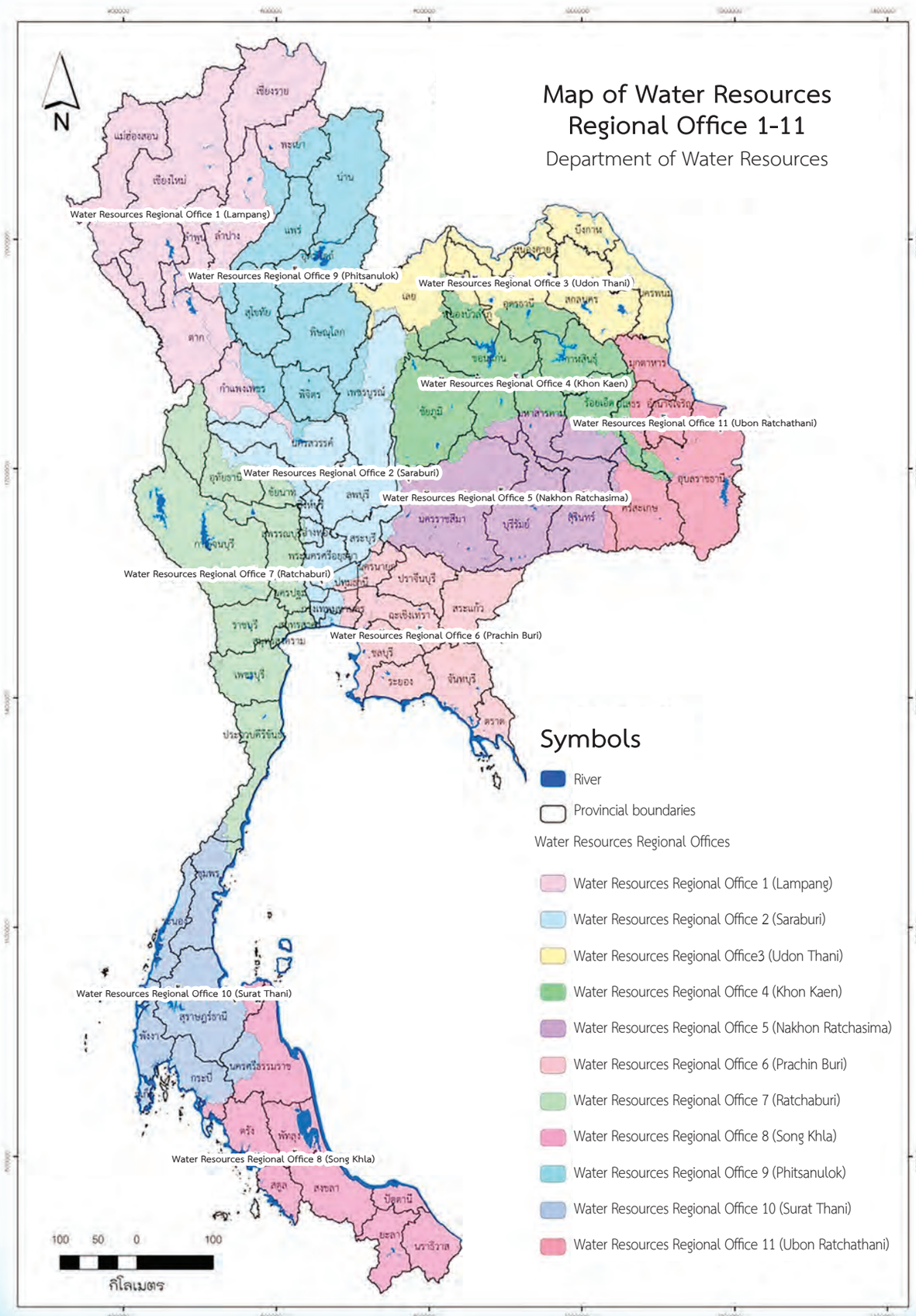
Organization Chart



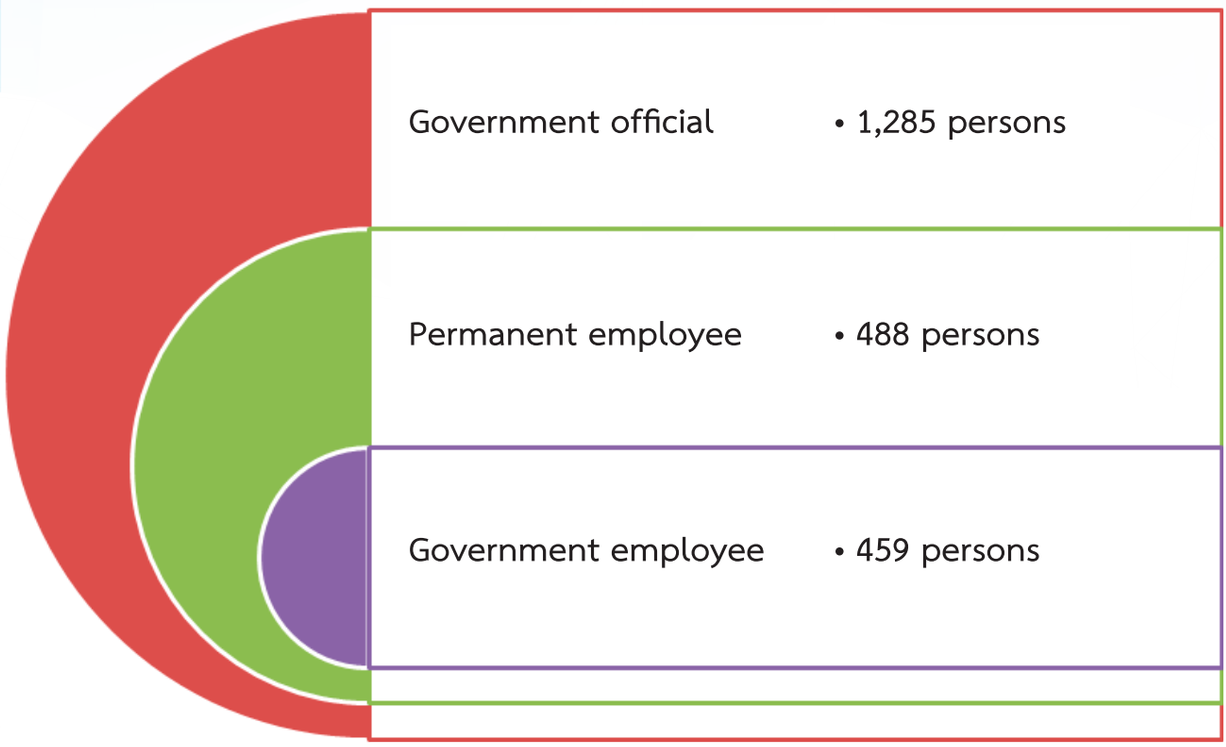
Administrative organization divided by the Ministerial Regulation

Established by internal organization

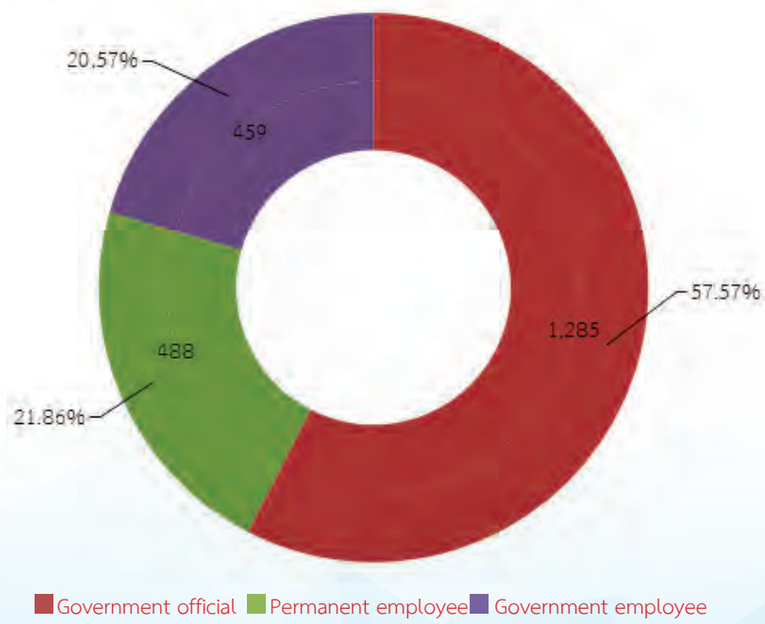
Map of Water Resources Regional Office 1-11

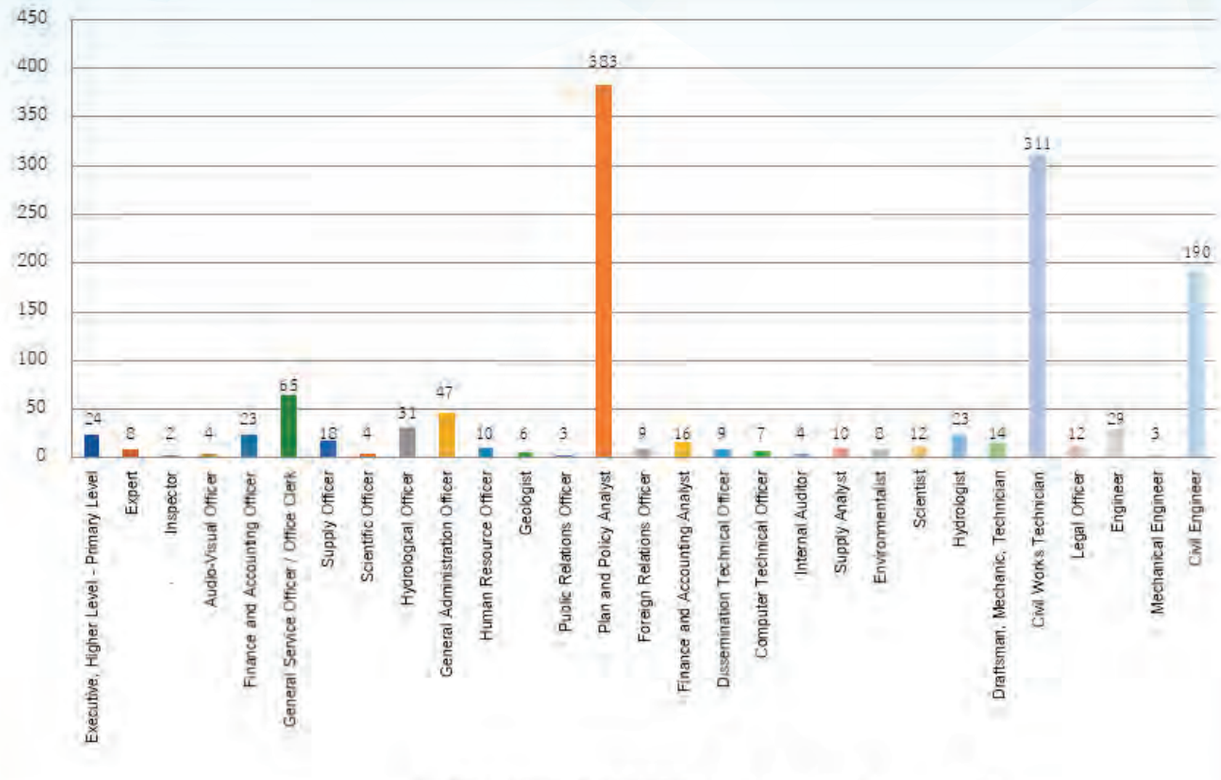


Manpower (For Actual Performance) as of 30 September 2018

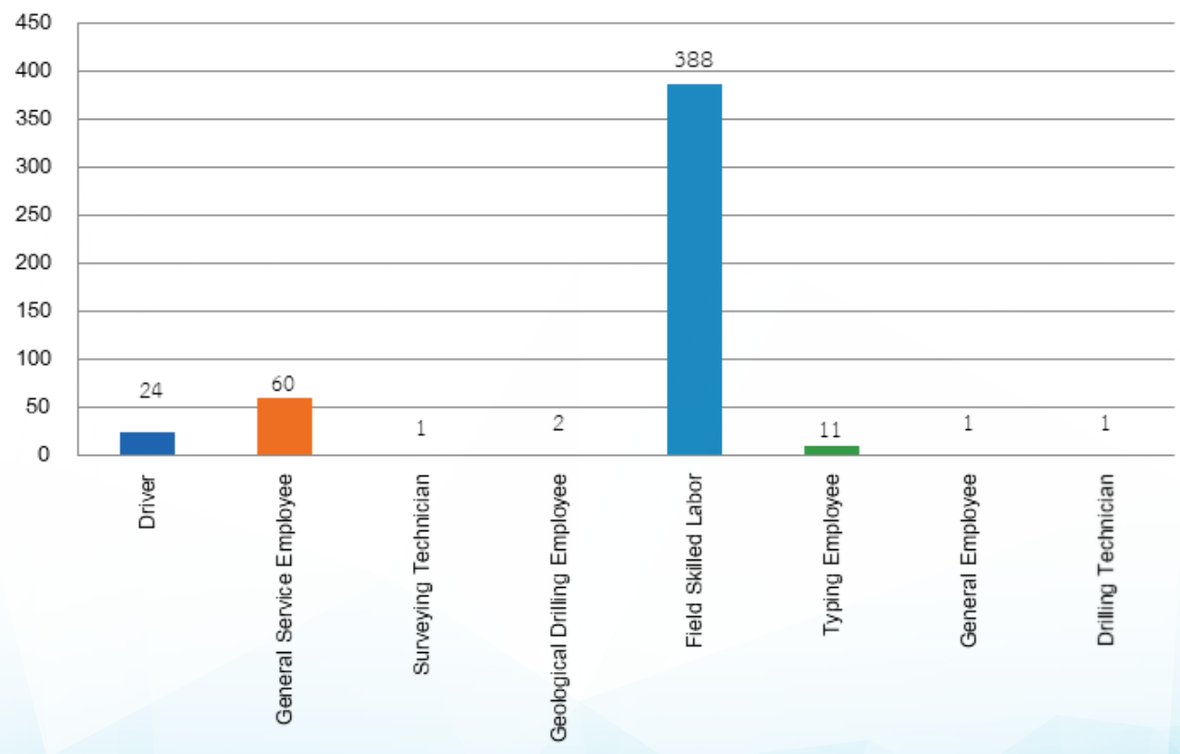


The proportion of Government official, Permanent employee and Government employee of the Fiscal Year of B.E. 2561 (2018)

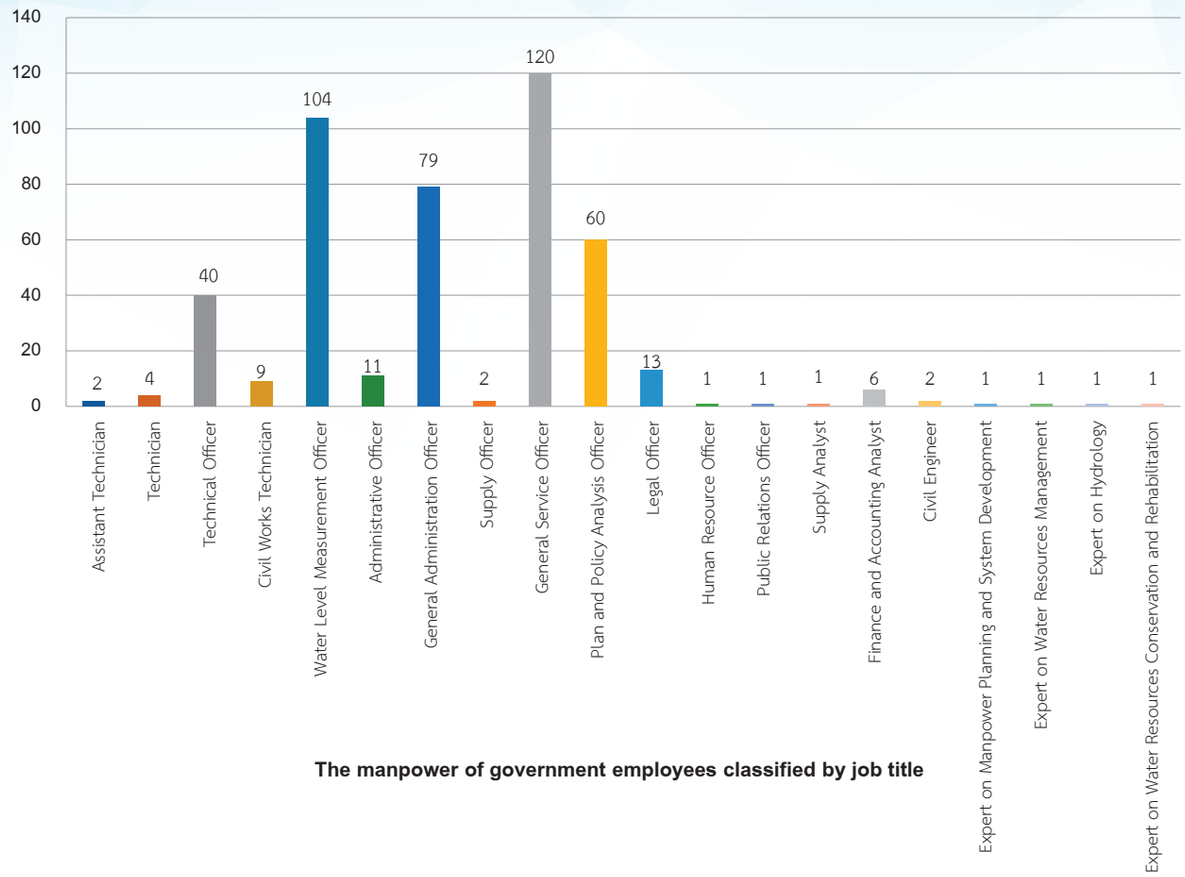




The manpower of government officials classified by job title



The manpower of permanent employees classified by job title

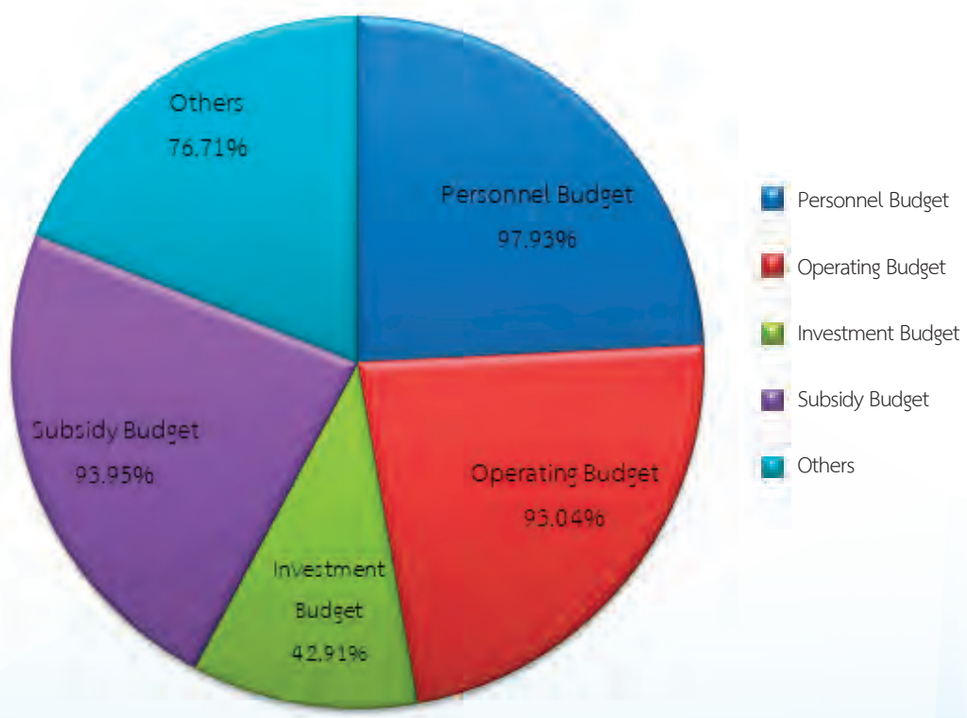


The manpower of government employees classified by job title

Annual Expenditure of the Fiscal Year of B.E. 2561 (2018)

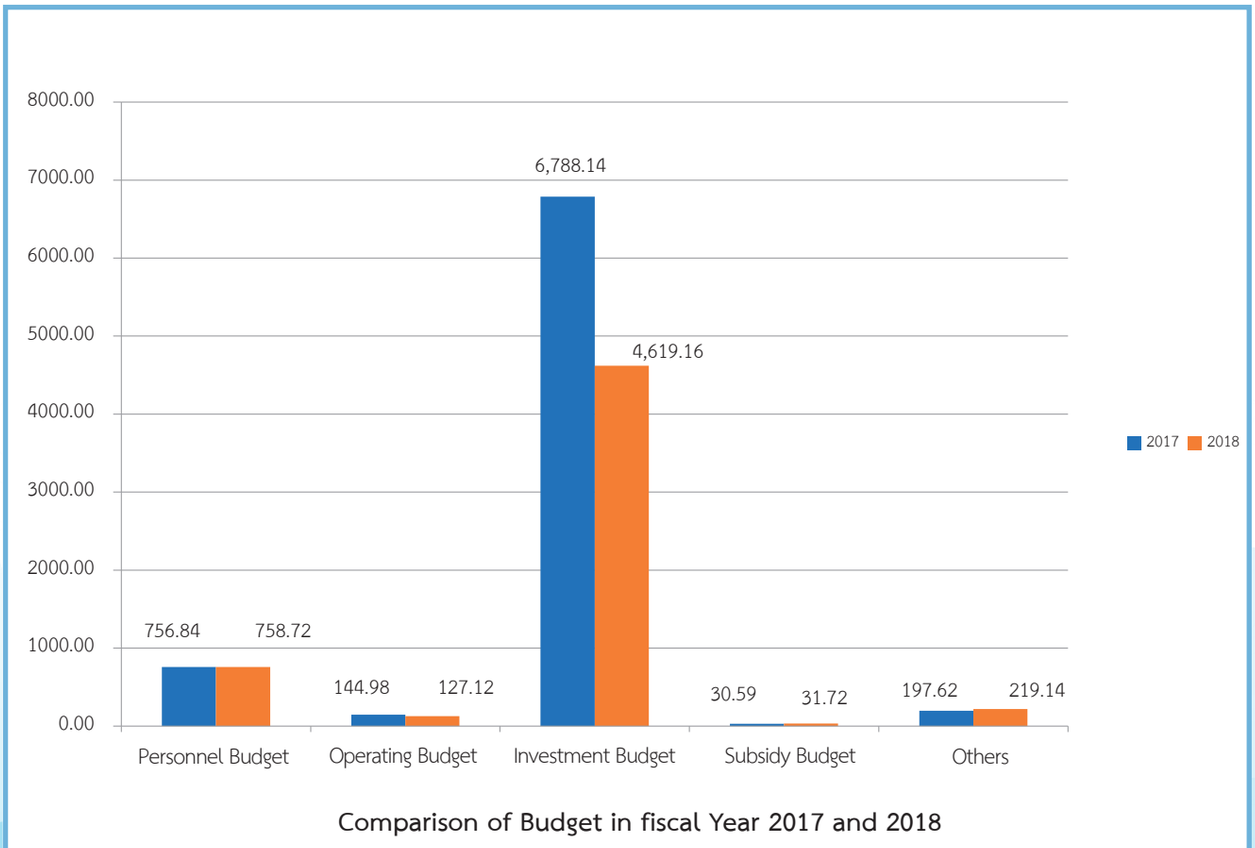
รายการ	Budget according to the Annual Expenditure Act	Annual Expenditure of the Fiscal Year of B.E. 2561 (2018)	Summary of Annual Budget Spending	Percentage of Budget Spending
Personnel Budget	758,717,200.00	747,587,200.00	732,145,030.71	97.93
Operating Budget	127,124,500.00	129,545,553.00	120,533,323.75	93.04
Investment Budget	4,619,157,000.00	4,537,201,864.00	1,946,841,854.81	42.91
Subsidy Budget	31,715,800.00	31,715,800.00	29,795,534.68	93.95
Others	219,143,800.00	191,660,372.00	147,020,664.12	76.71
Total	5,755,858,300.00	5,637,710,789.00	2,976,336,408.07	52.79

Summary of Annual Budget Spending



Comparison of Budget in fiscal Year 2017 and 2018

รายการ	Budget		Comparison Result	
	ปี 2017	ปี 2018	Increase (+) / Decrease (-)	Percentage
- Personnel Budget	756,836,300	758,717,200	+1,880,900	0.25
- Operating Budget	144,981,600	127,124,500	-17,857,100	-12.32
- Investment Budget	6,788,136,400	4,619,157,000	-2,168,979,400	-31.95
- Subsidy Budget	30,591,800	31,715,800	+1,124,000	3.67
- Others	197,615,700	219,143,800	+21,528,100	10.89
รวม	**7,918,161,800**	**5,755,858,300**	**-2,162,303,500**	**-27.31**



Comparison of Budget in fiscal Year 2017 and 2018

Budget summary of the Department of Water Resources in fiscal year 2018 is as follows:

1. The Department of Water Resources has received the budget amount 5,755,858,300.00 baht according to the Annual Expenditure Act of the Fiscal Year of B.E. 2561 (2018)
2. Budget Expenditure Transfer Act B.E.2561 (2018) of 93,608,700.00 as follows;
   - The primary work plans on water resources management and creating environmentally-friendly growth for sustainable development, the amount of 20,207,700.00 baht
   - The integrated water resources management work plans, the amount of 73,401,000.00 baht
3. Net budget received after the budget transfer/change (Annual Expenditure Act of the Fiscal Year of (B.E. 2561) 2018) has the amount left 5,637,710,789.00 baht. The Department of Water Resources has spent the budget to proceed as follows:
   - The expenditure on project implementation in fiscal year 2018 of 2,976,336,408.07 baht
   - The reserved budget for disbursements in overlapping fiscal year 2019 of 2,410,721,699.71 baht
   - The available budget of 250,652,681.22 baht returning to the finance division

Part 2

Performance Result

Performance Report

1. Performance Report according to the Performance Efficiency Improvement Measures (Section 44)

Details of the Self-assessment result according to the Performance Efficiency Improvement Measures (Section 44)
Organization: Department of Water Resources
Ministry of Natural Resources and Environment

Components	Indicators	Targets	Performance Report	Assessment Summary	
				Pass	Not Pass
1. Performance efficiency of basic missions (Function Base)	1. Achievement of the formulation of water resources management plan	Integrated Basin Development and Management Plan, 25 Basins	Water Resources Management Plan of 25 river basins are approved by River Basin Committees	✓	
	2. Achievement of Water Sources Development (projects)	295 projects	172 projects or 58.31 percent*		✓
	3. Number of household in the shortage area get benefits (households)	100,092 households	54,294 households or 54.24 percent		✓
	4. Numbers water sources which has quality in good level	Enhance water quality for 1 water sources in good level, 55 are still in moderate level	Enhance water quality for 1 water sources in good level, 55 are still in moderate level	✓	

*Due to the occurrence of flood, it has to adjust action plan by adding number of water sources development, totally 108 projects. 3661 households are benefited. But, the assessment will consider only specific projects indicated in the Budget Expenditure Act for the Fiscal Year 2018, this indicator does not pass the assessment.

Components	Indicators	Targets	Performance Report	Assessment Summary	
				Pass	Not Pass
2. Performance efficiency on strategic direction on public administration reform, priority policy, or special missions, or the integrated operation with multiple agencies (agenda base)	1. Indicator of public awareness raising				
	1.1 Percentage of the implementation of plan on public awareness raising	100 percent	100 percent	✓	
	1.2 Percentage of elucidation of critical issues timely (if any)	100 percent	100 percent, 1 project from 1 project	✓	
	2. Achievement on water resources database development	There are area database; (1) no-flood/ no-drought (2) no-flood /drought (3) flood/no-drought (4) flood/drought and database of numbers/size/ location of natural water sources covering 6 regions	There are database of numbers/size/ location of natural water sources covering 6 regions	✓	
3. Performance efficiency of main missions in the areas/local, regional, province, group of provinces or integrated operation in many areas or with multiple agencies (Area base)	- None –	- None –			

Components	Indicators	Targets	Performance Report	Assessment Summary	
				Pass	Not Pass
4. Performance efficiency on management and innovation development for public administration in budget system, personnel, public services to achieve the Public Service 4.0 (Innovation base)	1. Innovation development	Consider from the quality of innovation, It must have an assessment score of 50 points or more.	Innovation development of mobile application (connect data of water resources situation for people can track water resources data, and also report situation from the area via mobile devices anywhere at all time)	✓	
	2. Efficiency operation development in 3 activities - Energy saving - Paper use reduction - Budget saving	Operate by 80 percent	Operate by 91.66 percent	✓	
5. Performance efficiency on implementation of the 20-year National Strategy (Potential Base)	1. Formulation and implementation of the action plan for the National Strategy	To assess the competency on submission of outcome and disbursement of budget that demonstrates the potential of the organization in accordance with the specified criteria. Assessment score should be no less than 80 percent.	1. Operation as planned, percentage of achievement is 84 percent 2. Disbursement for 85.11 percent	✓	
	2. Formulation of organization reform plans	Submit the proposal of 3-year transition period plan to the e-SAR system before 26 October 2018	Submit the proposal of 3-year transition period plan to the e-SAR system before 26 October 2018	✓	

Assessment Summary

Component 1: DWR achieves 2 of 4 indicators. Assessment score is on target.

Component 2: DWR achieves 2 of 2 indicators. Assessment score is higher than target.

Component 3: DWR has no indicator in this component.

Component 4: DWR achieves 2 of 2 indicators. Assessment score is higher than target.

Component 5: DWR achieves 2 of 2 indicators. Assessment score is higher than target.

Government agency

DWR's performance is in 😐 standard level.

Remarks: Assessment Criteria

1. Compare number of indicators that achieve the targets to all indicators in each component

2. In each indicator, there are assessment criteria as follow;
   - Pass means Performance result is on target or higher than the target.
   - Not Pass means Performance result is lower than the target.

3. Each component will receive assessment result in the level of "on target" when;
   - Pass 1 of 2 indicators (50%)
   - Pass 2 of 3 indicators (67%)
   - Pass 2 of 4 indicators (50%)
   - Pass 3 of 5 indicators (60%)

4. Determine targets of each component from percentage of achievement as follows;
   - Below the target lower than 50%
   - On target between 50 - 67%
   - Above the target higher than 67%

5. Determine same weight for all indicators because they are core functions which are equally important

Performance Assessment for Internal Divisions has 3 levels;

😊 **Excellent,** Internal Division has performance result of all components higher than targets.

😐 **Standard,** Internal Division has performance result of some components higher than targets, but none is lower than target

☹ **Poor,** Internal Division has performance result of one component lower than targets. (Even other components are higher the target)

2. . Integrity and Transparency Assessment – ITA

The Project of Integrity and Transparency Assessment (ITA) in the fiscal year 2018 aims to assess the level of integrity and transparency on administrative management in government agencies aiming for providing recommendations for improving integrity and transparency and anti-corruption measures at policy and operational level. 222 government agencies have been tested, including 146 department-level units and 76 provincial-level units. The evaluation is based on 3 data sources namely 1) External Integrity and Transparency Assessment (EIT), 2) Internal Integrity and Transparency Assessment (IIT), and 3) Evidence-Based Integrity and Transparency Assessment (EBIT). The assessment index has five categories, including 1) Accountability Index, 2) Corruption-Fee Index, 3) Transparency Index, 4) Integrity Culture Index, and 5) Work Integrity Index. 146 department-level agencies have been evaluated for integrity and transparency by the Royal Police Cadet Academy authorized from the Office of Public Sector Anti-Corruption Commission.

The Royal Police Cadet Academy, authorized by the Office of Public Sector Anti-Corruption Commission, is responsible for conducting integrity and transparency assessment in the government agencies. The result is that DWR gets ITA Score of 83.54 percent, which is very high. The score can be categorized by index as follows;

1. Accountability Index, DWR receives the highest score with 92.13 percent.
   Level of Assessment : very high.
2. Corruption-Fee Index, DWR gets the score of 88.62 percent.
   Level of Assessment : very high.
3. Transparency Index, DWR receives a score of 87.61 percent.
   Level of Assessment : high.
4. Integrity Culture Index, DWR gets a score of 76.81 percent.
   Level of Assessment : high.
5. Work Integrity Index, DWR receives a score of 68.86 percent.
   Level of Assessment : high.

The Department of Water Resources gets the assessment score of 83.45 percent, which is ranked at 103rd from 146 agencies.

Summary of Integrity and Transparency Assessment Score by Index and Indicators

Index/Indicator	Weight (Percent)	EBIT	IIT	EIT	Score	Average Weight
1. Accountability Index	26				87.61	22.78
1.1 Disclosure of Information		100.00		90.63	95.31	
1.2 Participation		100.00		85.05	92.53	
1.3 Procurement		75.00			75.00	
2. Transparency Index	18				92.13	16.58
2.1 Mission Operations		100.00		92.01	96.01	
2.2 Perform Duties		100.00		92.93	96.47	
2.3 Faithful Intention of Executives		100.00	76.35	89.55	88.63	
2.4 Complaint Management		100.00	73.61	88.60	87.40	
3. Corruption-Fee Index	22				88.62	19.50
Bribery		100.00	78.51	87.35	88.62	
*In case of Fault Identification and Inquiry						
4. Integrity Culture Index	16				76.81	12.29
4.1 Strengthening Honest Culture		100.00	82.77		91.39	
4.2 Protection Conflict of Interests		50.00	72.93		61.47	
4.3 Anti-Corruption Plan		100.00	70.24		85.12	
4.4 Check and Balance			69.28		69.28	
5. Work Integrity Index	18				68.86	12.39
5.1 Standard and Fairness in Operation and Service		50.00	74.78	89.24	71.34	
5.2 Morality in Management			66.38		66.38	
Survey Score (100.00)		86.36	73.53	89.33		
Integrity and Transparency Assessment Score of the Organization						**83.54**

3. Performance Results of the Department of Water Resources

According to the Strategic Plan of the Department of Water Resources in the year 2018, it determines 3 strategic issues which are;

Strategic Issue 1: to develop mechanisms of integrated water resources management with a participatory approach, including;

1. Function-based Operation Plan on Water Management and Establishing of Sustainable Growth on the Quality of Life with Environment-Friendly
   (Output 1: Increasing the potential of water resources management mechanism)
2. Integration Operation Plan on Water Resources Management

(Projects of organizational development)

Strategic Issue 2: to conserve, rehabilitate and develop water resources and wetlands to provide water sources and increase storage capacity and drainage as well as maintain ecosystem balances, including;

1. Function-based Operation Plan on Water Management and Establishing of Sustainable Growth on the Quality of Life with Environment-Friendly
   (Output 2: Improvement and Maintenance of Water Sources)
2. Integration Operation Plan on Water Resources Management
   (Projects of Conservation, Rehabilitation, and Development of Water Sources, and water management)

Strategic Issue 3: to develop, install and improve early warning system for natural disasters and support climate change adaptation, including;

1. Function-based Operation Plan on Water Management and Establishing of Sustainable Growth on the Quality of Life with Environment-Friendly
   (Output 3: Improve the capacity of water forecasting and early warning system)

From these three strategic issues, the Department of Water Resources has operated projects in accordance with the strategic issues as follow;

1. Policy and Plan for Water Resources Management in the Rainfed Agricultural Area
2. Basin Management Plan and Participation
3. Water Management for Consumptions
4. Foreign Affairs
5. Development of Mechanisms
6. Organizational and Personal Development
7. Public Relations on Water Resources
8. Conservation, Rehabilitation, and Development of Water Sources
9. Early Warning and Hydrology

3.1 Policy and Plan for Water Resources Management in the Rainfed Agricultural Area

In order to develop the water resources management to be integrated, effective and sustainable in accordance with the National Reform Plan on public administration, economy, and natural resources and environment, and 20-year National Strategy in strategic issue: Establishing of Sustainable Growth on the Quality of Life with Environment-Friendly, pursuing the integration of data, plans or projects, budget, surveillance and assessment system, and orientation of operation supervision, Head of the National Council for Peace and Order has issued an Order No. 46/2517 on 22 January 2018 to establish the Office of the National Water Resources to be the main policy agency on national water resources management by transferring the missions and workforces from Department of Water Resources on policy recommendation, development of national water resources management plan, water resources management in inter-basin level, international collaboration with foreign countries and international organizations, monitoring and assessment, and a secretary of the National Water Resources Committee, to the Office of the National Water Resources.

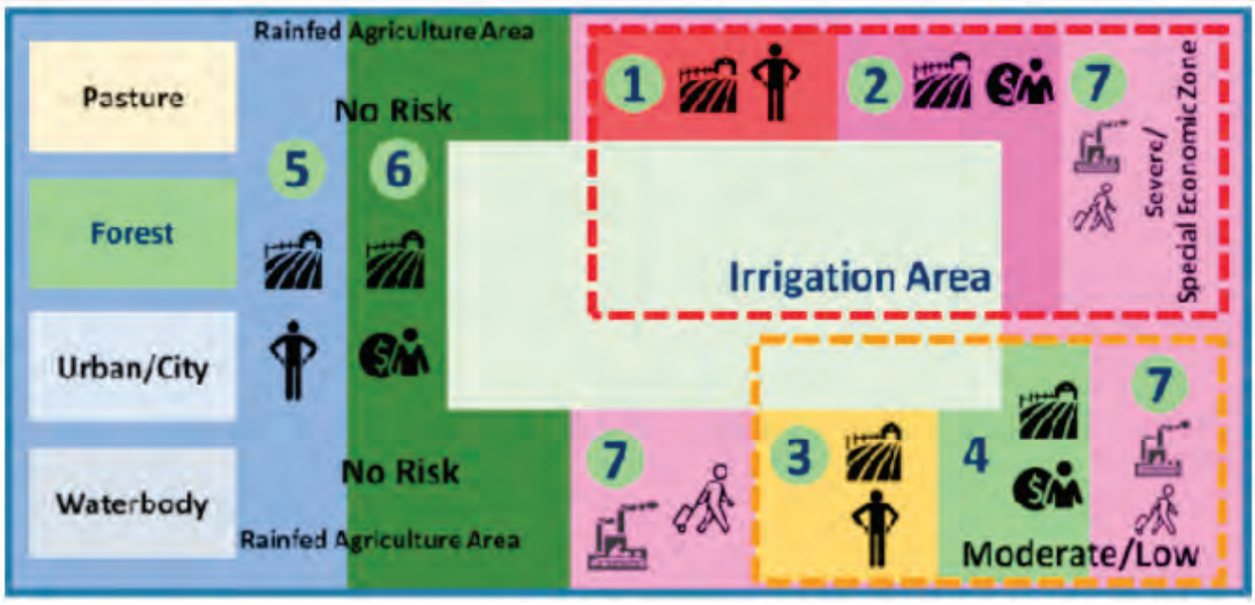
The Water Resources Act B.E. 2561 (declared in the Royal Thai Government Gazette, Book No. 135 Part 112ก on 28 December 2018) determines that the Department of Water Resources has duties under Section 1 Water Resources, Section 4 Water Allocation and Uses, Section 6 Conservation, and Development of Public Water Sources, Section 8 Civil Liability in Case of causing Damage to Public Water Sources. Under changing circumstance, the Department of Water Resources has to adjust the role itself to become an operator who is responsible in conservation, rehabilitation, and development of water sources and water distribution system, water resources management in the non-irrigated area and the rainfed agricultural area, as well as control, supervise, manage, conserve and develop public water sources. In the fiscal year 2018, the Department of Water Resources has implemented a water resources management plan and policy as follows;

1. Formulation of the 20-year Action Plan of the Department of Water Resources
2. Implementation of the National Reform Plan in the area of Natural Resources and Environment; Water
3. Implementation for achieving the Sustainable Development Goals 6: Ensure Availability and Sustainable Management of Water and Sanitation for all

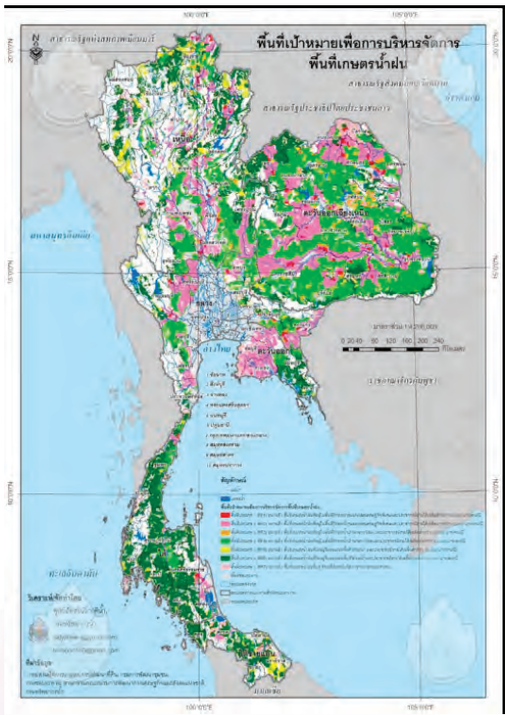
1. Formulation of the 20-year Action Plan of the Department of Water Resources

The constitution of the Kingdom of Thailand, B.E. 2560, Section 65 states that the Government has to make a 20-year National Strategy as a long-term sustainable development goal for the country following good governance principles. It is a framework for developing various master plans which are consistent and integrated for achieving the same target in the specific period. Thailand's 20-year National Strategy, with the vision of "to become a developed country with security, prosperity, and sustainability in accordance with the Sufficiency Economy Philosophy," consists of 6 strategies. The strategy that related to the mission of the Department of Water Resources is the fifth strategy "Creating growth based on the quality of life that is friendly to the environment." It frames the implementation of comprehensive water management master plan (Level 2 Plan: Master Plan under Thailand's 20-year National Strategy, issue 19). To conform with the Thailand's 20-year National Strategy, the National Reformation Plan, the 12th National Economic and Social Development Plan, Thailand 4.0 Policy and the changing context of water resources management, the Department of Water Resources has reviewed the performance to draft a 20-year Action Plan of the Department of Water Resources. It also has studied and analyzed the Crisis Area (Area-based) and population income structure in the rainfed agricultural areas in the fiscal year 2018 for prioritizing potential of rainfed agricultural areas based on geophysical, economic and social data respectively for planning the development of water sources/water distribution system in the rainfed agricultural areas consistently to their potentials and community way of life. The idea for the analysis of the critical areas is the classification of types of the rainfed agricultural area based on water resources risks area (flood and drought), personal annual income compared to the poverty line and revenue structure (agricultures, and other production sectors). This framework is used as a guideline for developing the 20-year Action Plan of the Department of Water Resources under the National Master Plan of Water Resources Management.

Analytical Framework of Water Crisis Area for the Rainfed Agricultural Area



Target Area for Development of Water Resource Projects in the Rainfed Agricultural Area



Target Area for Development of Water Resource Projects in the Rainfed Agricultural Area

Region	Rainfed Agricultural Area (Million rai)							
	RF1	RF2	RF3	RF4	RF5	RF6	RF7	Total
North	0.56	6.20	0.57	6.71	1.28	7.36	0.74	23.42
Central	0.32	3.92	0.30	3.88	0.30	2.41	1.36	12.49
East	0.04	3.18	0.01	0.40	0.08	1.93	1.32	6.96
Northeastern	1.04	14.43	2.08	26.64	0.65	9.28	3.18	57.30
South	0.07	0.56	0.04	1.00	0.41	10.98	0.50	13.56
Deep South	0.01	0.22	0.03	0.14	0.76	3.60	0.53	5.29
Total	2.04 (2%)	28.51 (24%)	3.03 (3%)	38.77 (33%)	3.48 (3%)	35.56 (29%)	7.63 (6%)	119.02

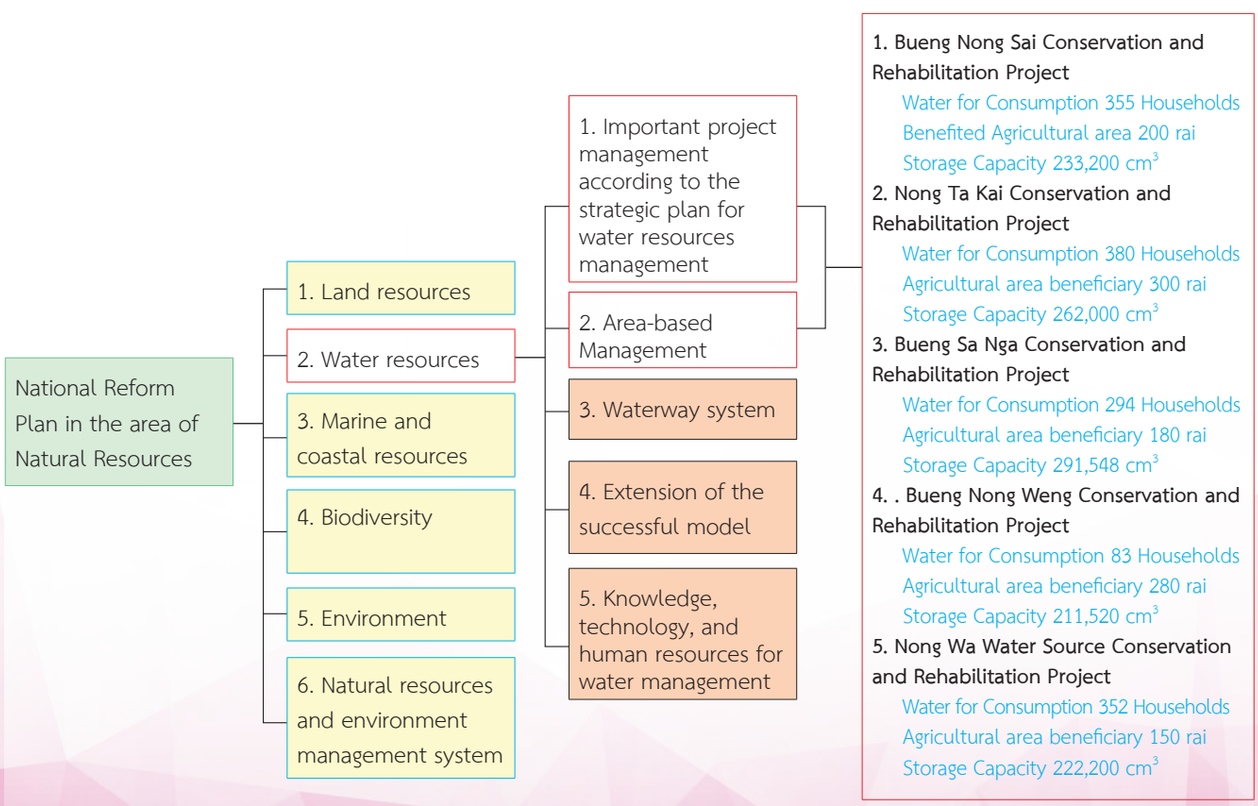
Severe/ Special Economic Zone | Moderate-Low | No Risk

2. Implementation of the National Reform Plan in the area of Natural Resources and Environment; Water

The Constitution of the Kingdom of Thailand, B.E. 2560, and the National Reform Plan Act, B.E. 2560, prescribes to develop the National Reform Plan, which, presently, it has already been announced in the Government Gazette. The Plan has 11 crucial reform issues; one of them is natural resources and the environment. It prioritizes urgent matters, applies the King's Wisdom and the guidelines from the Royal Initiated Project to extend their results. For natural resources and the environment issue, the Plan has identified six reform issues, namely 1) land resources, 2) water resources, 3) marine and coastal resources, 4) biodiversity, 5) environment and 6) natural resources and environment management system. In 2) water resources, there are five reform frameworks including;

1) Important project management according to the strategic plan for water resources management
2) Area-based Management
3) Waterway System
4) Extension of the successful Model
5) Knowledge, Technology, and Human Resources for Water Management

Department of Water Resources, a government agency under the Ministry of Natural Resources and Environment, is responsible for gathering the results of the implementation of the National Reform Plan on Natural Resources and Environment in Water Issues. In the fiscal year 2018, the Department of Water Resources has implemented numbers of flagship and quick-win projects under the National Reform Plan such as water resources conservation and rehabilitation projects in Lam Chiang Krai Basin, Nakhon Ratchasima Province. The diagram on Project Implementation of the Department of Water Resources is shown below;



3. Implementation for achieving the Sustainable Development Goals 6: Ensure Availability and Sustainable Management of Water and Sanitation for all

Department of Water Resources is the leading agency who is responsible for pursuing the achievement of Sustainable Development Goal 6: Ensure availability and sustainable management of water and sanitation for all. It has carried out the implementation through working group mechanism to achieve the goal. There is a result from the High-Level Political Forum on Sustainable 2018 and High-Level Segment on ECOSOC, held during 7-18 July 2018 at the United Nations Headquarters in New York, USA. Representatives from 47 countries have conducted the Voluntary National Review (VNR) to present their implementation of the 2030 Agenda. The 2018 SDG Index and Dashboards provide ranking results evaluating 156 nations by aggregating SDG Index of overall performance. Sweden is the top global ranking Index Performance, Singapore is 43th, and Thailand is 59th (Thailand is ranked on 4th among ASEAN countries after Singapore, Malaysia, and Vietnam). However, if assessed by the target, it is found that Thailand's score on SDG6 is 94.8 of 100. The factor of a high score is that people can access basic potable water and sanitation as well as water sources. However, the problem of water quality and wastewater treatment still challenges

3.2 Basin Management Plan and Public Participation

Department of Water Resources is responsible for the implementation of Thailand's Strategic Plan on Water Resources Management, Strategy 6: Management. Key activities include supporting of community, river basin organizations, and networks, conducting strategic plan/master plan/action plan in a normal situation and crises at national and basin levels as well as public relations and public participation to ensure that the implementations are in line with the National Strategic Plan on Water Resources Management.

In order to develop and promote the participation of organizations at all level in water resources management for every basin as well as to be a mechanism to drive water resources management by a participatory approach for all sectors, the Department of Water Resources has implemented two projects in the fiscal year 2018, namely;

1) Project Implementation of the Important Water Resources Events

2) Project Implementation of River Basin Management for 25 Main Basins

1. Project Implementation of the Important Water Resources Events

In the fiscal year 2018, the Department of Water Resources has implemented two projects on the occasion of the important water resources event as follows;

1.1 Organizing Activities on the Occasion of the National Water Resources Conservation Week and World Water Day 2018

To create awareness on water conservation, the United Nations announces that the 22nd of March of every year as World Water Day. The event aims to raise awareness on the importance of water resources and encourage the global community to jointly conserve water resources by maintaining and developing water sources continuously and sustainably. For Thailand, the Cabinet had a resolution on 8 July 2018 approved that the week that falls on 22nd of March in every year is the National Water Conservation Week. Department of Water Resources, Ministry of Natural Resources and Environment has given the importance of this occasion, and continually conducts activities on conservation and rehabilitation of water resources every year to support UN activities and responds to the government policies. The theme of the year 2018 is "Nature for Water."

1.2 National Canal Conservation and Development Day 2018

The Cabinet has the resolution that on 20th of September in every year is the National Canal Conservation and Development Day. The event is arisen from the event of Her Royal Highness Princess Maha Chakri Sirindhorn proceeded by boat to inspect the condition of the Saen Saeb canal and visit the people on both sides of the channel from Bangkok to Chachoengsao province on 20 September 1994. The Department of Water Resources is an agency that has a role in promoting the public participation of all sectors and raising awareness on the importance and value of canal. Therefore, the Department of Water Resources has organized the National Canal Conservation and Development Day in the fiscal year 2018 to create awareness on the importance of the canals for people. The event promotes public participation and integration of all sectors, including government, public, and private sectors.

Output:

1. Activities on the occasion of the National Water Resources Conservation Week and World Water Day 2018 were held on Thursday, 22 March 2018 at IMPACT Arena, Exhibition and Convention Center, Muang Thong Thani, Nonthaburi Province. Event activities include 1) Lecture and Discussion, and 2) exhibition. Participants include river basin committees, river basin sub-committees, working groups and networks, representatives from government sectors, state enterprises, private sectors, academic institutions, and people, totally 1145 participants. Overall, 85 percent of attendees are satisfied with the project.

2. Two events on the occasion of the National Canal Conservation and Development Day 2018 were organized on Thursday, 20 September 2018. The details are as follow

2.1 Around Nakhon Chaisi River, Royal Police Cadet Academy, Sam Phran Subdistrict, Sam Phran District, Nakhon Phathom Province. Participants consist of representatives from government and private agencies, water user groups, networks, volunteers, educational institutions, people, youths, and DWR staffs, totally 713 persons

2.2 Around Mae Klong River, Jed Samian Market, Photharam District, Ratchaburi Province. Participants include representatives from government agencies, private agencies, water user groups, networks, volunteers, educational institutions, people, youths, and DWR staffs, which are 430 persons. Activities consist of 1) drawing contest in the theme of “My Canals”, 2) Exbinition, 3) Local fruit and premium products exhibition/ local cooking from local ingredients, 4) stage performance for raising awareness about conservation and development of the canal, 5) trade fairs for selling products of Nakhon Phathom Province and Ratchaburi Province. In general, 81 percent of attendees are satisfied with the project.

Outcome:

Public and private sectors, people, stakeholders are aware of the value of water resources. All agencies maintain, conserving, developing, and restoring water resources for sustainable benefits together.

Key success:

1. Department of Water Resources emphasizes the importance of organizing activities on the occasion of relevant events at the national level.

2. Cooperation from all sectors, including public and private sectors, and local people.

The National Water Resources Conservation Week and World Water Day 2018

The National Canal Conservation and Development Day 2018

2. Project Implementation of River Basin Management for 25 Main Basins

The government has set important policies for managing Thailand's water resources. The Cabinet approved Thailand's Strategic Plan on Water Resources Management (2015-2026) proposed by the Committee on Policy and Water Resources Management on 7 May 2015, and assigned the National Water Resources Committee to implement the Plan. Department of Water Resources, as a secretary of the National Water Resources Committee, has a responsibility in the implementation of Strategy 6: Management. Tactics in strategy 6 include supporting of community organizations, river basin organization, and their networks in every level, developing a strategic plan, master plan and action plan in both the normal situations and crises at the national and basin levels, promoting public relations and participation, etc. The Department of Water Resources has established river basin organizations in 25 main basins, namely, River Basin Committees and Sub-committees, River Basin Working Group at the provincial level, sub-basin level and network groups. It is a mechanism to drive integrated water resources management by participation process, capacity building, and the promotion of public participation. To comply with the country's water resources management strategy, the Department of Water Resources has necessarily to increase the efficiency of the water resources management plan at national, basin, and local levels as well as establish a development framework of water resources management plan. It consists of analyzing the relevant policies and performance results, following action plan/projects in 2018 that has received the budget from the related agencies, organizing workshops to create an integrated basin management and development plan as well as conducting a meeting of river basin organizations at all levels.

Output and Outcome:

1. 25 basins have proceeded with the procedures on the development of the water resources management plan, and successfully develop it, which are approved by their River Basin Committees.

2. Water users and River Basin Committees in 25 main river basins, local authorities, officials, and networks increase their knowledge and awareness on public participation for basin management. No less than 20,000 participants or more than 80 percent are satisfied with the project.

Successful Condition:

1. The strategic plan for water resources management for 25 Basins has been developed and taken entry into force. As a result, they can develop the guidelines and expand the results of the operation following the National Strategic Plan on Water Resources Management.

2. There is good cooperation from all sectors in water resources management.

3.3 Water Resources Management for Consumption

According to Thailand's Strategic Plan on Water Resources Management, Strategy 1: Water Resources Management for Domestic Use, Department of Water Resources is responsible for developing water infrastructure for consumption. It is consistent with Strategy 5: Eco-friendly Development and Growth in the 20-year National Strategy and the target of the Department of Water Resources in the fiscal year 2018 that "People have enough water for consumption with the standard of water quality and a fair price." It covers a wide range of target groups including enhancing potential of local authorities who is primarily responsible for managing public water services, protecting consumers in urban areas in case of water supply concession, increasing water use efficiency in government agencies according to the government policies as well as building on the research studies on the development of drinking water systems in remote areas. There are four projects including;

1. Development of Draft Guidelines on Quality Standards Assessment for Village Water Supply System
2. Supervision for water supply concession
3. Water-saving Promotion and Monitoring Program for Government Agencies
4. The Project of Supervision, Monitoring, maintenance, and Quality Surveillance of Drinking Water Production System in Schools in accordance with the Development Plan for Children and Youth in the Remote Area by the Royal Initiative of Her Royal Highness Maha Chakri Sirindhorn Princess Maha Chakri Sirindhorn

1. Development of Draft Guidelines on Quality Standards Assessment for Village Water Supply System

According to the National Strategic Plan on Water Resources Management (2015-2026), the vision is "every village has clean water for consumption, water for production is secured, damage from the flood has decreased, water quality meet the standard, managing sustainable water resources under the balanced development with the involvement of all sectors." In the Strategy 1: Water Resources Management for Domestic Use in the National Strategic Plan on Water Resources Management has a goal to provide surface water/groundwater sources and develop rural water supplies or village water supplies to have clean water for consumption to 7,490 villages by 2017. Department of Water Resources has conducted a 20-year Department of Water Resources Strategy (2018-2036). According to Strategy 1: Water Consumption, it has set a target that people have sufficient water for consumption with a fair price and meets the quality standard. It conforms to the United Nations Sustainable Development Goals (SDGs), Article 6.1, which states that seeks to secure safe and affordable drinking water for all by 2030. Department of Water Resources has transferred the mission of the village water supply to local authorities; they have to operate by themselves since 2003. It is found that people in many areas still suffer from water shortage of available clean potable water. Therefore, the Department of Water Resources needs to increase the efficiency of the village water supply system for local authorities. In the fiscal year 2018, the government has approved the budget for developing the Draft Guidelines on Quality Standards Assessment for Village Water Supply System.

Output:

1. Relevant government agencies, private sectors, and local authorities get involved in the development of Draft Guideline on Quality Standards Assessment for Village Water Supply System.

2. There is the development of guideline and quality standards of village water supply system. 10,000 copies of data with software program for processing the quality standard of village water supply system are entirely produced as planned in the fiscal year 2018. They have been already delivered to local authorities across the country. Department of Local Administration and relevant agencies use these as tools for monitoring quality of village water supply system. This lead to the further development of the quality standard of the village water supply system across the country.

Outcome:

1. There are guideline and quality standards of village water supply system with data and software program for processing the quality standard of village water supply system as tools for monitoring quality of village water supply system. This will lead to the development of the quality standard of the village water supply system across the country in the future.

2. Local Authorities, Department of Local Administration, and relevant agencies have used the guideline as a tool and mechanism for supervising and monitoring the quality of village water supply system.

3. People in rural areas have sufficient quality and affordable drinking water that meets international standard.

Success Conditions

1. Relevant agencies from both public and private sectors and local authorities, participate in the development of the Draft Guidelines on Quality Standards Assessment for Village Water Supply System. They are educated and have a mutual understanding. The project achieves its target.

2. Officials of the Department of Water Resources from headquarters and the Water Resources Regional Office 1-11 are educated. They have expertise in the village water supply system.

2. Supervision for Water Supply Concession

Water supply concession business is operated under the law, namely the Announcement of the Revolutionary Council No. 58 dated 26 January 2015. It is defined as a public work which requires concession contract granted by the Minister of Natural Resources and Environment. It except water supply business with specified laws such as water supply work of Metropolitan Waterworks Authority which is operated under the Metropolitan Waterworks Authority Act, B.E. 2510 (1967) and water supply works of Provincial Waterworks Authority which is performed under the Provincial Waterworks Authority Act B.E. 2522 (1979) or local authorities. The water supply concession business is operated under these laws;

1.The Notification of the Ministry of Natural Resources and Environment regarding Guidelines on Concession of Water Supply Business for the Safety and People's Well-being, B.E. 2554 requires that private sectors who wish to proceed with waterworks services have to ask for a concession from the government. It aims to protect water users and assure that they can get clean and safe water supply for consumption at a fair price. Currently, the water supply concession business is under the supervision of the Department of Water Resources, Ministry of Natural Resources and Environment with a total of about 600 places in 19 provinces.

2. The Notification of the Ministry of Natural Resources and Environment regarding the Appointment of Officials for Implementation of the Announcement of the Revolutionary Council No. 58 dated 26 January 2015 in the part of water supply business dated 30 April 2019 has authorized the executives and officials from the Department of Water Resources, Water Resources Regional Office and Provincial Offices of Natural Resources and Environment to inspect and supervise the operation of water supply business in accordance with the Announcement and conditions of the concession. Inspection and supervision are set to be conducted at least once a year for controlling and supervising water supply concession business based on terms and conditions. Inspection details include water supply system structure, distribution system, pricing, service time, and quality of water. For the water quality testing, inspectors take a sampling from the inspected area to test its primarily quality following parameters in the Notification of the Department of Health regarding the Drinking Water, B.E. 2553 (2010). Besides, they have to investigate various problems of water supply business, advise, conduct a satisfaction survey from water users as well as examine violations of terms and conditions in the contract.

Therefore, the Department of Water Resources has undertaken supervision for water supply concession to inspect, control, and supervise the water supply concession business to make sure that the operations are following the law. Further, it give advices to the concessionaires for adequately protecting water users who use water supply for domestic consumption to receive clean and safe water with excellent service at a fair price. It also promotes the water supply business.

Output:

Department of Water Resources has inspected, supervised, and promoted the water supply concession business in totally 66 licenses in 19 provinces.

Outcome:

1. The concessionaire of the water supply business follows the guidelines and regulations following the terms and conditions of water supplyconcession business and related laws.

2. 54 water supply concession businesses are inspected, controlled, and supervised annually. Twelve new enterprises have been promoted.

3. People have sufficient, clean, and safe water that meets international standard.

4. Officials who are responsible for water supply concession business obtains and can proceed legally.

Successful Condition:

The promotion of education and understanding about guidelines and regulations, techniques, and conditions of water supply concession business and relevant laws is a key success factor. It is the procedure for Officials from Water Resources Regional Offices, and Provincial Offices of Natural Resources and Environment to jointly supervise water supply concession business.

3. Water-saving Promotion and Monitoring Program for Government Agencies

According to the Resolution on July 28, 2015, the Cabinet has acknowledged the water-saving methods in government agencies following the resolution of the National Water Resources Committee. It calls for government agencies to conserve water at least 10 percent and report the performance monthly. This method has established short-term water-saving guidelines for government agencies. They have to follow these guidelines for conserve water. It is to alleviate water shortage and create equality between various sectors in water uses reduction. Office of the Public Sector Development Commission (OPDC) has stipulated water-saving results as a key performance indicator for Permanent Secretary, Director General and Executives of all government agencies, state enterprises, local authorities, judicial agencies, parliament and schools under the Office of the Basic Education Commission since 2016. The Office of the Civil Service Commission and the Department of Water Resources are authorized to determine evaluation criteria jointly. The Department of Water Resources, as a Secretary for the National Water Resources Committee (in that period), was assigned to be the leading implementation agency. From the performance reports submitted to the DWR website, it is found that 409 agencies have registered to participate in the project. In 2016, 184 agencies can reduce water use more than 10 percent, representing 43.52 percent from the total. The Department of Water Resources has reported the results to the Office of the Civil Service Commission. In the fiscal year 2018, the Department of Water Resources has received the budget for the implementation of Water-saving Promotion and Monitoring Program for Government Agencies.

Output and Outcome:

1. There are guidelines for monitoring and evaluating water saving in government agencies. It helps agencies to be aware of water usage and know its trend monthly.
2. There is promotion on water saving to government agencies.
3. It creates awareness about participation in water-saving for officials in government agencies.
4. 200 government agencies are supported for water conservation.

Successful Condition:

1. There are workshops on Water-saving Promotion and Monitoring Program for Government Agencies.
2. There are government agencies getting support, create awareness, and be involved in water-saving in their departments.

4. The Project of Supervision, Monitoring, maintenance, and Quality Surveillance of Drinking Water Production System in Schools in accordance with the Development Plan for Children and Youth in the Remote Area by the Royal Initiative of Her Royal Highness Maha Chakri Sirindhorn Princess Maha Chakri Sirindhorn

Department of Water Resources has conducted a research program and construct drinking water treatment by slow sand filtration system with the production capacity 100 liters per hour in schools in accordance with the Development Plan for Children and Youth in the remote area by the Royal Initiative of Her Royal Highness Maha Chakri Sirindhorn Princess Maha Chakri Sirindhorn since the fiscal year 2011. The treatment system is designed based on the conditions of the area environment and schools. There are three target areas, which are 1) Mae Fah Hill-tribe Community Learning Center, 2) Border Patrol Police (BPP) School, and 3) General Buddhist Scripture School (Phra Parayadhamma). There are two types of the treatment system. The first type is a slow sand filtration system for non-electric drinking water treatment with the production capacity of 100 liters per hour, which is used in the high area by using mountain water supply system. The second is electric drinking water production system, which is used in the water supply system area, but the quality is still not meet the standard. In the fiscal year 2015, Department of Water Resources studied the installation of drinking water treatment by slow sand filtration system with the production capacity 100 liters per hour to remote areas in Omkoi and Mae Chaem District, Chiangmai Province. As a result, Water Resources Regional Office 1 has a training course, guideline, and technology on drinking water treatment systems, which are implemented in the fiscal year 2019 by the adjustment of the action plan. The project targets are the areas in 6 provinces in the upper northern region.

Output:

1. Department of Water Resources follows up the usability of drinking water treatment system, monitor its water quality, and demonstrate maintenance procedures to system administrators in 300 schools in Chiang Mai, Mae Hong Son, Chiang Rai, Phayao, Lampang and Tak Province.

2. Department of Water Resources organizes training of both types of drinking water production for transferring those know-how technologies to representatives from local authorities in Tha Song Yang District, Tak Province and Mae Sariang District, Mae Hong Son Province in totally two batches. It also establishes a learning center for water drinking treatment by slow sand filtration system for representatives in Ban Mae Usu Witthaya School, Tha Song Yang District, Tak Province and in Thai Rath Witthaya School (Ban Thung Phrao), Mae Sariang District, Mae Hong Son Province.

3. Department of Water Resources organizes activities of improvement, repair and clean drinking water treatment in preparation for the reception of Her Royal Highness Princess Maha Chakri Sirindhorn Princess Maha Chakri Sirindhorn on the occasion of proceeding to visit and following up three schools namely Indira Gandhi Prize Border Patrol Police School and Thanpuying Praphai Sivakoset Border Patrol Police School in Omkoi District, Chiang Mai Province, and Chao Pho Luang Uppatham 2 Border Patrol Police School in Phrao District, Chiang Mai.

Outcome:

1. Drinking water treatment can purify water for teachers and students as well as citizens continuously and efficiently.

2. Teachers and staffs, who are responsible for drinking water treatment, have knowledge and ability to use and keep up the system appropriately.

3. Teachers, students, and people continually have clean water for consumption.

4. Drinking water treatment by slow sand filtration system with the production capacity of 100 liters per hour is increasingly used. Potential agencies have built them in high areas.

5. There is a learning center for Drinking water treatment by slow sand filtration system with the production capacity of 100 liters per hour for educating people.

Successful Condition:

There is technical evaluation, knowledge management, development of knowledge, and technology transfer process to officials in the target areas for transferring the mission to local authorities.

3.4 Foreign Affairs

International cooperation requires continuous coordination and participation in the platform to build concrete cooperation through various forms such as bilateral and multilateral cooperation and being a member of the international organizations. Knowledge and experience exchange and sharing with foreign agencies is also necessary to apply those technologies and best practices on managing water resources into Thailand context. So, the Department of Water Resources has to enhance the capacity of officials to be more effective and productive for propelling the mission of international cooperation to be advance and extend the scope of collaboration. In the fiscal year 2018, the Department of Water Resources has implemented six projects including;

1) MRC Core River Basin Management Function Decentralization to Member Countries

2) The 24th Mekong River Commission Council Meeting

3) Financial Contribution for Mekong River Commission

4) Temporary Visit Abroad

5) International Workshop on RBO Performance Benchmarking

6) The Project of Hiring Consultant to Study and Monitor Transboundary Environmental Impact from Hydropower Project Development on Mainstream Mekong River

1. MRC Core River Basin Management Function Decentralization to Member Countries

Mekong River Commission (MRC) is an inter-governmental organization consisting of 4 member countries, namely the Kingdom of Cambodia, Lao People's Democratic Republic Socialist, the Republic of Vietnam, and the Kingdom of Thailand. It has a responsibility in water and related resources management in the Lower Mekong Basin for equitable and reasonable utilization of sharing resources among member states. To carry out the management of the Lower Mekong River Basin, the MRC will formulate an MRC Strategic Plan which is in line with the Basin Development Strategy (BDS) for setting same development directions as well as decentralize of core river basin management function to the member countries.

Under the government policy of the Kingdom of Thailand, public agencies must operate following the Royal Decree regarding Good Governance and Administrative Procedures B.E. 2556 (2013). It aims to develop an excellent administration system to support state development in the globalization era by adhering a good governance principle and the benefit of people. It also determines methods and mechanisms in translating the policy into action for government agencies. According to the Royal Decree regarding Good Governance and Administrative Process B.E. 2556 (2013), section 16, it states that the government must prepare a 4-year Action Plan and Annual Action Plan to support the implementation of the administration plan bound with the fiscal budget.

The Implementation of the Lower Mekong Basin Management, Thailand has processed the National Indicative Plan (NIP) to be the 5-year implementation framework, which has ended in 2015. Hence, to continuously implement and develop the Mekong River Basin, there must conduct the National Indicative

Plan in 2016-2020, which is in line with national and regional policies. It takes the MRC framework into account as well as considering the 11th and 12th National Economic and Social Development Plan, Thailand's Strategic Plan on Water Resources Management (2015-2026), the lesson learnt from the formulation of National Action Plan (2011-2015) as well as the integrated water resources management projects from relevant agencies and river basin organization.

Output and Outcome:

There is integration on water resources management between the public sector, civil societies in 8 Mekong provinces, related agencies, and Lower Mekong Basin countries to achieve sustainable development with the same goal as well as decentralize the core function of river basin management to the member countries.

Successful Condition:

It is an obligation under the Lower Mekong Cooperation Agreement to transfer the core river basin management function to the member countries. The goal is to achieve the well-being of Thai People along the Mekong River. There is a network between civil society, public and private sectors, educational institutions, and stakeholders from all sectors. They have to work together to achieve the goal of sustainable Lower Mekong Basin development




2) The 24th Mekong River Commission Council Meeting

The 24th Mekong River Commission Council Meeting is an annual ministerial meeting by the Council Member of the Mekong River Commission (MRC) consisting of the Kingdom of Thailand, the Kingdom of Cambodia, Lao People's Democratic Republic (Lao PDR) and the Socialist Republic of Vietnam. The People's Republic of China and the Republic of the Union of Myanmar also join the Meeting as dialogue partners. The objective is to discuss and formulate the policy for sustainable development in the Mekong River Basin, administration, cooperation framework with dialogue partners, development partners, and related international organizations.

The Prime Minister has approved the Ministry of Natural Resources and Environment to be a co-host with Mekong River Commission Secretariat (MRCS) to organize the 24th Mekong River Commission Council Meeting on 28-30 November 2017 at the Intercontinental Pattaya Resort, Bang Lamung District, Chonburi Province. He also appointed Thai delegation to attend the Meeting. Minister of Natural Resources and Environment or representative is head of the delegation. Permanent Secretary for Natural Resources and Environment and Director General of the Department of Water Resources as Thai delegates attend the Meeting.

On 21 November 2017, the Cabinet approved the discussion framework for the 24th MRC Council Meeting proposed by the Department of Water Resources and authorize the delegations to discuss with member countries of the Mekong River Commission.

Output:

The Cabinet Meeting on 27 March 2018 acknowledged the results of the 24th MRC Council Meeting as follow;

1. General Surasak Kanchanarat, Minister of Natural Resources and Environment, as chairman of the Council of the Mekong River Commission in the year 2017, serves as the chairman of the Meeting. Participants include Deputy Minister of Water Resources and Meteorology of Cambodia (HE Mr. Bun Hean), Deputy Minister of Natural Resources and Environment of the Lao PDR (HE Mme. Bounkham Vorachit), Deputy Minister of Natural Resources and Environment of Vietnam (HE Mr. Nguyen Linh Ngoc), Permanent Representative of People's Republic of China for the United Nations Economic and Social Commission for Asia and Pacific (ESCAP) as dialogue partners, and 9 representatives from development partners and related organizations.

2. The Meeting approved the 2017 MRC Action Plan, which goals and activities are set consistently to the MRC Strategic Plan 2016-2020. The revenue is USD 15.64 million (from member countries, development partners, administration fee, and others). The expenses are totally USD 13.60 million, which is spend for carrying out six main activities namely, 1) research, 2) strategy preparation, 3) developing an action plan, 4) operation according to the 5 water utilization procedures 5) cooperation development 6) Water Resources Monitoring, and 7) organization development. In this regards, the Meeting has prioritized activities into two batches; 39 activities in the 1st batch and 21 activities in the 2nd batch.

3. The Meeting approved the Mekong Climate Change Adaptation Strategy and Action Plan (MASAP) as a document policy. It includes strategic priorities and climate change adaptation project in the Mekong Basin by identifying risks and enhancing adaptation measures for climate change from 3 plausible future scenarios. It presents the climate change impact assessment at the river basin level in 7 areas including hydrology, flooding, drought, hydroelectric power, ecosystems and biodiversity, food security, and socio-economy. MASAP also provides strategic recommendations and action plan for climate change adaptation in the Mekong River Basin.

4. The Council Meeting approved Basin-wide Fisheries Management and Development Strategy (BFMS) which is a guideline for fishery resources management in the Mekong River Basin. There are 10 key strategic priorities namely, 1) Fisheries Monitoring, Analysis, Modelling & Assessment, 2) Conservation of Key Habitats, 3) Fisheries Enhancement (restocking or habitat enhancement), 4) Fisheries and Fish-friendly Irrigation and Agriculture, 5) Aquaculture Development, 6) Gender and Fisheries, 7) Fisheries Co-management, 8) Transboundary Issues and Shared Fish Stocks, 9) Water Development and Fisheries and 10) Fisheries and Climate Change.

5. The Council Meeting approved the MRC's contribution formula for the year 2019-2030. The current proportion of contribution, which will be in effect until 2019, is that Thailand is 30 percent, Cambodia is 20 percent, Lao PDR is 20 percent, and Vietnam is 30 percent. Since 2019, the proportion will increase by 1 percent (for Cambodia and Lao PDR) and decrease by 1 percent (for Thailand and Vietnam) in every three years. In 2030, member states will contribute to the same proportion, which is 25 percent equally. The total subsidy of member countries will increase by 10 percent every year.

6. The Council Meeting considered the development of cooperation with dialogue partners (China and Myanmar), development partners, and other regional cooperation frameworks. Activities with China and Myanmar as dialogue partners include joint study and research on hydrology, technical exchange and capacity building on sedimentation, and establishment of a basin development plan in Myanmar. The European Union and Japan as development partners expressed their intention to contribute financial support to the MRC. There are increasing of cooperation activities with international organizations such as ASEAN, Korea Development Institute, the Kingdom of Morocco, Mississippi River Commission of the United States, United Nations Economic and Social Commission for Asia and the Pacific, etc.

7. The Meeting discussed the preparation for the 3rd Mekong River Commission Summit which will be held on 5 April 2018 in Siem Reap, Cambodia. On this occasion, the Prime Minister of Cambodia will inform the Prime Minister to attend the Summit with the head of government of Lao PDR, Vietnam, China and Myanmar. The theme of the Summit is "Enhancing Joint Efforts and Partnerships towards the Achievement of the Sustainable Development Goals in the Mekong River Basin." The Siem Reap Declaration 2018 will be endorsed by the leaders of the MRC member states.

Outcome:

1. There is the development of cooperation in the sustainable development of the Mekong River Basin under the Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin (1995) as well as protection of the environment and ecological balance of the Mekong River Basin.

2. Cooperation policy is set as an implementation and budget framework. It supports the cooperation in water resources management and related resources in the Mekong River.

3. It prevents the conflict with neighbor countries arising from water contention.

4. The platform provides modern transboundary water management, promotes a green economy, and conducts a guideline for food, water, and energy security.

5. The Summit has strengthened capacity in international coordination and negotiation as well as cross-border water management for related officials.

Successful Condition:

1. Policies are translated into practices in the fields of international cooperation and domestic operation.

2. There is integration and guidelines for implementation of public agencies, especially in the issues related to the mission of other government agencies such as climate change adaptation, fishery, and etc.

3. Financial Contribution for the Mekong River Commission

Government of Thailand has an obligation to contribute annual financial support to the Mekong River Commission (abbreviated as MRC) according to the Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin in 1995. Article 14 stipulates that member countries have to pay subsidies to the MRC on an equal basis annually. It will be the budget for operation in administration, development, and conservation of water resources and other related resources in the Mekong River Basin for mutual benefits between four member states namely, the Kingdom of Cambodia, Lao People's Democratic, Republic Kingdom of Thailand, and the Socialist Republic of Vietnam. Later, the contribution procedure is changed. The contribution rate depends on the financial potential of each country. The financial contribution schedule for the year 2010-2015 has been developed by calculating from GDP per capita, area of irrigation, and flood plan area within the Lower Mekong Basin. The 7th MRC Council Meeting held on 24 October 2000 in Pakse, Lao PDR has approved the schedule. It comes into effect since 2001.

Output:

1. There is the basin development planning with participation from member countries.
2. There is equitable and reasonable utilization for maximizing mutual benefits and minimizing harmful effects.
3. Any developments have to concern natural resources management and environmental protection to ensure the unique ecological balance of the Mekong Basin.
4. There is the promotion of capacity building in the Mekong River Basin for sustainable development, environmental protection, and ecological balance.

Outcome:

It jointly manages the organization appropriately and effectively by complying with the Agreement and implementing projects, plans, and any activities carried out under cooperation and coordination between member states and the international community. It also aims to consider various problems that may arise from the utilization and development of water resources and related resources of the Mekong River Basin at the right time. Member states become good neighbors.

Successful Condition:

It creates collaboration in all areas of sustainable development, utilization, management and conservation of water and related resources in the Mekong River Basin such as irrigation, hydropower, navigation, flood prevention, fisheries, downstream logging, recreation, and tourism. It is to maximize mutual benefits or all parties and minimize harmful effects caused by natural phenomena and from humans' activities.

4. Temporary Visit Abroad

Presently, countries around the world prioritize water problems such as flood, drought, and water quality as well as the effect of climate change on water resources. They are a global agenda, which the global community seeks for a solution together. There are bilateral and multilateral cooperation, organization of international conference, knowledge and experience exchange through a training program and technical visit as well as an exhibition on water management technologies and innovations. These activities aim to discuss on excellent management and solution from experienced experts around the world. At the international event, important persons at the national level often participate in the events and present their visions and water policies. The events may have the vote for issues. Department of Water Resources as a water agency has a mission on water management at the national level. Department of Water Resources has bilateral cooperation with foreign countries such as Thailand-Australia, Thailand-Germany, Thailand-China, Thailand-Singapore, Thailand-Lao PDR. For multilateral cooperation, DWR is a member to international organization with obligation/agreement such as the ASEAN Working Group on Water Resources Management (AWGWRM), the UNESCO International Hydrological Program (IHP), a member of the Network of Asian River Basin Organizations (NARBO), the United Nations (UN), Mekong River Commission (MRC), the Contracting Parties to the Convention on Wetlands, and the Contracting Parties to United Nations Framework Convention on Climate Change. Executives and officers, especially who work in foreign affairs, have to travel abroad to attend meetings, negotiate with international agencies and international organizations, and exchange knowledge and experience with international experts every year.

Output and Outcome:

1. There are cooperation projects resulted from the negotiation.
2. There is the dissemination of knowledge and innovation to officials of the Department of Water Resources and other stakeholders for further utilization.
3. Officials of the Department of Water Resources have increased the potential and capacity on water management.
4. Cooperation network in both domestic and international level has been expanded.

Successful Condition:

Implementing water operation projects under international cooperation framework need key factors such as personnel, knowledge, stakeholders' participation, communication technology, and budget. All mentioned factors are still significant problems and obstacles that impede the success of projects or water cooperation projects.

5) International Workshop on RBO Performance Benchmarking

Thailand has 25 river basins, and River Basin Committees (RBC) as River Basin Organization (RBO), are responsible for river basin planning and management. Water Resources Regional Office 1-11 serves as secretary of the RBC. Department of Water Resource has adopted the Integrated Water Resources Management (IWRM) Principles as the main guideline for managing river basin. IWRM Principle is widely recognized as an effective mechanism for managing water resources. It can help to reduce conflicts; increase benefits for the basin, and is consistent with the Sustainable Development Goals (SDGs). River Basin Committee plays a vital role in driving integrated water resources management to reach its goals. Therefore, it is necessary to improve the operation of RBO; like other general organizations.

The RBO performance benchmarking service was launched at the 2nd Southeast Asia Water Forum in, Indonesia. After 12 months of participatory design, it is initial implementations in selected basins in Indonesia. Later, the execution is expanded into other basins of Southeast Asia. Currently, the Network of Asian River Basin Organization (NARBO) and Center for River Basin Organization and Management (CRBOM) sponsor the application of RBO Performance Benchmarking. NARBO and CRBOM supported Thailand to organize training on RBO Performance Benchmarking for Officials of the Department of Water Resources and stakeholders in the Upper Mun Basin in 2013.

In order to promote this tool which could support the implementation of the IWRM principles in all 25 river basins, the Department of Water Resources, in collaboration with NARBO, has organized International Workshop on RBO Performance Benchmarking for representatives from River Basin Organizations in Thailand, Asia, and NARBO member networks.

Output:

Department of Water Resources, in collaboration with NARBO, organized International Workshop on RBO Performance Benchmarking on 26-28 June 2018 at Ramada D' ma Bangkok Hotel. The objective is to increase knowledge and understanding about guidelines for evaluating, comparing, and establishing operational goals of river basin organization systematically for practitioners in a river basin organization in Asia. Participants include 29 officials from the Water Resources Regional Office 1-11, 15 officials from the central office, and seven officials from foreign water agencies in Asia, totally 51 participants.

Outcome:

1. Officials who work in the river basin organizations in Thailand and Asia increase knowledge and understanding about the RBO Performance Benchmarking. They can apply the guideline for their operation.

2. In term of economy, there is government expenditure which supports domestic businesses such as hotel, restaurants, and airline.

3. In term of society and environment, it creates cooperation and networks. Representatives from water networks from Thailand and foreign countries participate in the workshop. They can contact, coordinate, and exchange information in the future.

Successful Condition:

The availability of budget, staffs, and duration of action.

6) The Project of Hiring Consultant to Study and Monitor Transboundary Environmental Impact from Hydropower Project Development on Mainstream Mekong River

In the fiscal year 2014 and 2015, the Department of Water Resources conducted a Study of Transboundary Environmental Impact from Hydropower Project Development on Mainstream Mekong River. The study emphasizes on baseline data generation for predicting environmental and social impact occurring in the Mekong River Basin in Thailand, including physical environment data (water quality and wetland), biological data (biodiversity and water ecology), economic data (agriculture, fishery and tourism), social data (hygiene, tradition and culture), and ecological service data. However, the early phase of the study is incomplete in term of completeness of data, benefits, and application of the data to explain the transboundary environmental impact. Besides, study tools and methods, data, and facts collection in the early phase still have gaps for further research. The study cannot define the linkage of transboundary environmental impact from hydropower project development on the mainstream Mekong River because the scope and area of study are too broad. It is used as a primary data for the next phase.

Department of Water Resources observes that it is necessary to study and monitor the transboundary environmental and social impact continuously from the fiscal year 2018. It is also consistent with the original master plan jointly conducted with the Office of Natural Resources and Environmental Policy and Planning. Firstly, the Department of Water Resources has identified the study areas in Thailand, consisting of Kok Basin, Khong Basin, Chi Basin, Mun Basin, and Tonle Sap Basin. Subsequently, the Department of Water Resources has determined the specific area for the next phase including eight provinces of Thailand along mainstream Mekong River covering an area of 15 kilometers from the mainstream and some part of the Tonle Sap Lake. The implementation of the study project in the fiscal year 2018 will be the 5th year-round for 15 consecutive years of the study. The methods of research and primary data collection need to be improved continuously. Secondary data analysis in terms of area and period needs more precisely. Some vital and important fields of study need more in-depth study including assessment of the value of various ecological services, linkage/separation of migration in aquatic animals, change of fishery production, changes of nutrients and contaminants in water, and monitoring of water level fluctuation in flood season.

Output:

Department of Water Resources determines the term of references for hiring a consultant to conduct the project in the fiscal year 2018. It also appoints various committees consisting of Committee on Hiring Consultant and Technical Supervision Committee, Acceptance Inspection Committee to supervise the consultant for conducting the project as planned.

Outcome:

1. The report of the Study of Transboundary Environmental Impact from Hydropower Project Development on Mainstream Mekong River project in the year 2014-2015.

2. The preliminary criteria for the identification of risk areas and transboundary environmental assessment.

3. Advanced database system in the form of information technology and others with the website for dissemination to the public via DWR's website.

4. Proposed measures on transboundary environmental impact deduction and mitigation, and adaptation plan for people in vulnerable areas for the next phase operation. Policy recommendation to support the decision-making process of the Thai National Mekong Committee

5. Civil society networks have knowledge and understanding in monitoring and assessment of transboundary environmental impact from hydropower project development on mainstream Mekong River.

3.5 Mechanism Development

The Department of Water Resources has developed mechanisms for increasing performance efficiency, facilitating operation, and building the learning organization effectively. In the fiscal year 2018, DWR has carried out three projects consisting of;

1. Development of Knowledge and Technology on Water Resources Management Project "Assessment and Monitoring of Surface Water Quality of Community Water Resources in Risk Area from Climate Change: A Case Study of the East Coast Basin"

2. Improvement on the Standard Drawings of Water Resources Restoration and Rehabilitation Project

3. Feasibility Study on the Appropriateness, Topographic Survey, and Initial Environmental Examination (IEE) for Noong Khane Nang Water Sources Restoration and Rehabilitation Project, Kabin Buri District, Prachinburi Province

1. Development of Knowledge and Technology on Water Resources Management Project "the Assessment and Monitoring of Surface Water Quality of Community Water Resources in the Area of Climate Change Risk: A Case Study of the East Coast Basin"

Climate change directly impacts to Thailand's climate, in terms of increasing of temperature, changing of rainfall volume and pattern, a number of rainy days, delays of rain take a longer time, the occurrence of extreme weather, etc. The impact of climate change also affects community water sources. The evaporation rate increases causing the amount of natural water in water sources decrease. Also, the volume of dissolved oxygen, which is related to temperature and pressure, has decreased. Community water sources are vital sources for people's well-being. They are sources of water supply for domestic uses, sources for food, goods, or service. It concerns that if the feature of community water sources has changed due to climate change, it will widely effect to the society and people.

For this reason, it is necessary to build on the knowledge of climate change and its impact on water quality of community water sources. Department of Water Resource has conducted the project of Assessment and Monitoring of Surface Water Quality of Community Water Resources in Risk Area from Climate Change: A Case Study of the East Coast Basin". The project has the objective to monitor and evaluate the quality of community water sources in the East Coast Basin area. Also, it aims to analyze the causal factors of climate change, which affects the quality of community water sources. These are for creating an important set of knowledge about climate change adaptation for water management. The Department of Water Resources takes this opportunity to educate people, students, and schools as well as to encourage them to participate in water quality monitoring in their community water sources. There is an alternative way to create water security.

Output:

The Department of Water Resources has conducted data surveys, collection, and analysis to make a research summary. It builds a set of knowledge about the relationship between climate change and the quality of community water sources as well as its impact. Then, DWR uses these set of knowledge to educate students through the activity “Water-loving Youths, Adopt with Global Warming.” 147 students from Ban Nam Daeng Border Patrol Police School, Khlung District, Chanthaburi Province, participate in the event. Moreover, DWR has engaged in the community for promoting water resources conservation in Rayong Province and Chanthaburi Province through 3 workshops with activity on water quality management of community water sources, with totally 100 participants.

Outcome:

People understand the situation on quality of community water sources as well as the trend of water quality under threat from climate change. The project raises awareness for participating in monitoring quality of community water sources to create water security in communities.

2. Improvement on the Standard Drawings of Water Resources Restoration and Rehabilitation Project

Department of Water Resources is responsible for conducting survey, design, estimate the construction cost of water resources restoration and rehabilitation projects according to the annual budget plan by determining design and criteria, drafting term of reference, conserving, restoring and maintaining water sources. These have objectives to increase the water storage capacity of natural water sources and to improve existing water sources facilities. Currently, the survey, design, and drawing of water resources restoration and rehabilitation project of central and regional offices are done project by project. Since there is no standard design, structural drawing requires a long time. In order to prepare for the action plan of the decentralization process transferring mandates to local authorities in the future, the Department of Water Resources has considered the solutions for solving these problems by conducting standard drawings of water sources restoration and rehabilitation project. It allows central and regional offices can utilize this standard drawings to design and plan the projects effectively. It also can reduce processing time, and the project meets the engineering standard based on academic principles.

Output and Outcome:

Department of Water Resources has organized training programs for officials, who are responsible for designing water resources conservation and rehabilitation projects in both the central and regional offices. They can understand and apply knowledge for their work effectively. It can reduce processing time, and the design meets the engineering standard based on academic principles.

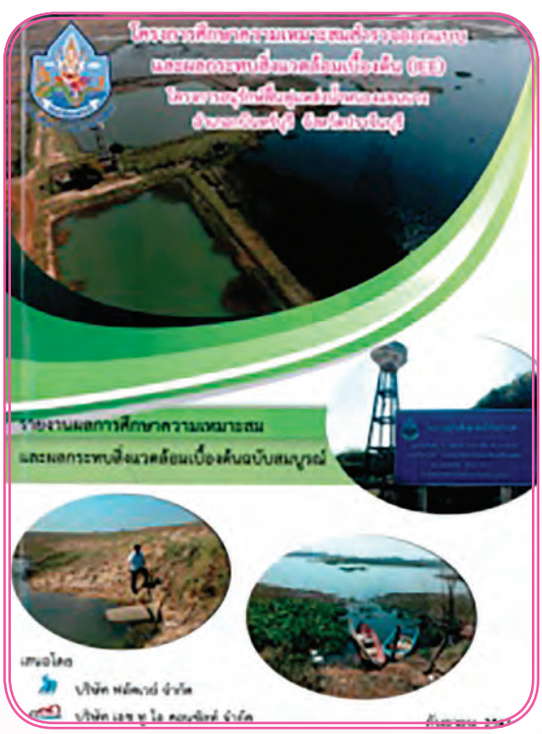
3) Feasibility Study on the Appropriateness, Topographic Survey, and Initial Environmental Examination (IEE) for Noong Khane Nang Water Sources Restoration and Rehabilitation Project, Kabin Buri District, Prachinburi Province

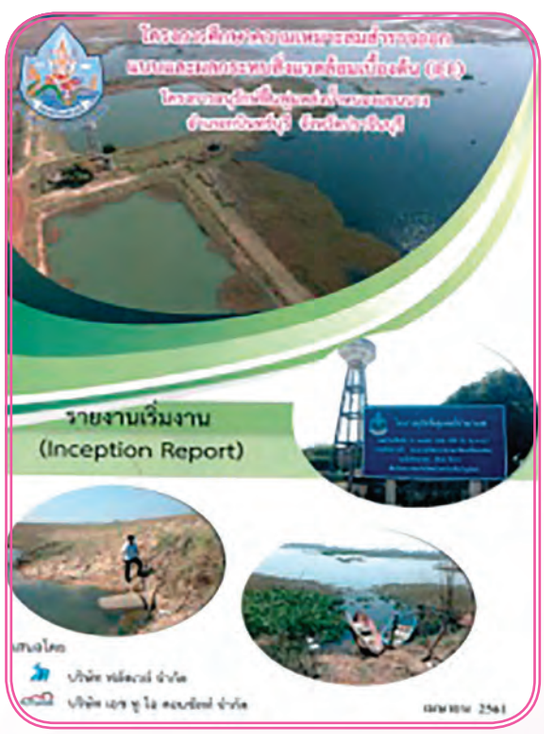
Nong Khane Nang is a public water source with the area of 740 rai covering the ara of Moo 8, 11 and 15 of Wang Dan Subdistrict and Moo 3 of Kabin Subdistrict Prachinburi Province. In the part of Wand Dan Subdistrict, it closes to the Prachinburi River. It has been affected by severe flood and drought every year. From the topographic survey, Nong Khane Nang water source can be developed as a large reservoir for solving flood and drought problems in the areas of Wang Dan Subdistrict and Kabin Subdistrict. However, due to the current situation, the water source is shallowly caused by the accumulation of sediments and weeds. It cannot store sufficient water for uses in the dry season and cannot retain water during flood season. It causes water scarcity and flood that damage to agricultural areas, property, and people's mentality. Also, some floodplain areas have been turned into agricultural regions.

For this problem, the Department of Water Resources foresees the necessity to conserve and rehabilitate Nong Khane Nang water sources. It is a water storage, an origin of native plant and animal species. Local communities are allowed to participate in management, conservation, and sustainable utilization of water source. So, it is necessary to conduct Feasibility Study on the Appropriateness, Topographic Survey, and Initial Environmental Examination (IEE) for Noong Khane Nang Water Sources Restoration and Rehabilitation Project, Kabin Buri District, Prachinburi Province. The output of the project will be used for the construction phase.

Output and Outcome:

Department of Water Resources gains data from the Feasibility Study on the Appropriateness, Topographic Survey, and Initial Environmental Examination (IEE) for Noong Khane Nang Water Sources Restoration and Rehabilitation Project, Kabin Buri District, Prachinburi Province for further conservation and sustainable utilization of water source.





3.6 Organizational and Personnel Development

Organizational and Personnel Development

Turnaround the Department of Water Resources towards Public Service System 4.0

The Department of Water Resources applies Public Sector Management Quality Award (PMQA) framework to turnaround to the Public Service System 4.0. The frameworks can catalyst organizational development and increase management performance to be an excellent modern organization with good governance, and meet international standard. It focuses on strengthening internal factors within the organization that can drive the organization to achieve the Public Service System 4.0. Public Sector Management Quality Award (PMQA) has seven criteria categories, namely;

1. Leadership
2. Strategy
3. Customers and stakeholders
4. Measurement, analysis, and knowledge management
5. Workforce
6. Operations
7. Results

In the fiscal year 2018, the Department of Water Resources was certified the Public Sector Management Quality Award at Fundamental Level No. 2, and receive the 2018 PMQA Award on 12 December 2018. It is given by Mr. Thongthong Chantharang, a chair of the ceremony. The Department of Water Resources is one of 49 agencies that obtain the Public Sector Management Quality Award at Fundamental Level No. 2 in the fiscal year 2018.

Office of the Public Development Commission determines that government agencies have to be evaluated for improving organizational management. Also, it is an opportunity to increase organizational competency. The assessment criteria consider from the performance of the executives on organization management including good governance, social responsibility, prioritizing of strategic plan, effective operation and monitoring system, creation of satisfaction, engagement and good relationship with clients and stakeholders as well as to conduct knowledge management and analysis to develop organizational and personnel competency, and etc.

“This winning award can encourage officials of the Department of Water Resources to strive for organizational development in preparation for the PMQA 4.0 assessment in the year 2019.”

Personnel Competency Development to pursue the Public Service System 4.0

In addition to organizational development by the PMQA framework, the Department of water resources has conducted training programs on water management, topographic survey, construction, hydrology work, project management, public sector management, firefighters, etc. There are nine training courses as follows;

1. The Training Course on the Development of Government Employees, 72 participants.
2. The Training Course on Construction Supervision for Water Sources Development, Conservation, and Rehabilitation Project Batch 3, 35 participants.
3. The Training Course on Hydrology Survey titled “Runoff Assessment.”, 40 participants.
4. Workshop on the Study of Potential and fundamental Appropriateness for Water Sources and Wetland Conservation and Rehabilitation Project, 43 participants.
5. Training Course on Surveying for Structural Design on Water Sources Development, Conservation, and Rehabilitation Project Batch 2, 36 participants.
6. Training Course on Project Design for Water Sources Development, Conservation, and Rehabilitation Project (water distribution by a solar-powered irrigation system, 36 participants
7. Training Course on Water Balance Analysis in the Target Area Batch 1, 30 participants
8. Training Course on Water Balance Analysis in the Target Area Batch 2, 31 participants
9. Training Course on Fire and Disasters Prevention in the Department of Water Resources Building, 85 participants

The examples are as follows;

1) Training Course on Project Design for Water Sources Development, Conservation, and Rehabilitation Project (water distribution by a solar-powered irrigation system)

Department of Water Resources is an agency that implements the Strategic Plan on Water Resources Management, Strategy 1: Water Management for Consumption. Water is a basic need for living and people's well-being. It has to provide water to people for consumption in the urban and rural areas. It also implements Strategy 2: Building Water Security for Production Sector (Agriculture and Industry) which both sectors play an essential role in socio-economy development of the country. Construction of water sources for agricultural and industrial production sectors can reduce poverty and support the national economic security as well as reduce the risk of water shortage. The Department of Water Resources has operated water sources development, conservation, and rehabilitation projects in all regions. Presently, the Department of Water Resources has a plan to conduct the water sources development, conservation, and rehabilitation projects with the water distribution by the solar-powered irrigation system. People in the project area can use water to do farming with less water to make more income during the dry season. The design is a significant step in project execution. It has to consider geography, water direction, and engineering principles. Additionally, the Department of Water Resources has standard guidelines of water sources development and rehabilitation projects with a solar-powered irrigation system. To maximize the utilization, officials of the Department of Water Resources has to have technical knowledge and understanding. People have to participate in the maintenance of water facilities and water distribution system. The Department of Water Resources has conducted a Training Course on Project Design for Water Sources Development, Conservation, and Rehabilitation Project (water distribution by a solar-powered irrigation system).

Output and Outcome:

The Department of Water Resources has conducted the training for officials from Central Offices and Water Resources Regional Office 1-11. Trainees can gain knowledge, and more understanding about topography survey for water sources project, utilization of standard drawing, budget estimation, and construction of water distribution system. They can apply package software in drawing of topography map and fundamental design.

2) The Training Course on Hydrology Survey titled “Runoff Assessment”

Hydrological data is one of the important data of irrigation, consumption, fishery, navigation, hydropower generation, forecasting, etc. It is used for testing the achievement of sustainable development; water sources development projects, general research on hydrology. Hydrological data is important in fields of study for flood and drought problem, project planning on water sources development, water sources conservation, and rehabilitation, as well as the utilization of the completed projects consistently to the changing environment and hydrological data of all basins, historical data in the basin areas to analyze the changing of climate, daily, monthly, and yearly rainfall and runoff. It is input for the planning of water sources development schemes to protect lives, property, and damage, save time and expenses, and benefits to people. The scheme is a guideline providing standard, accurate, reliable data which can be utilized for further effective management. Concerning the importance of hydrological data, the Department of Water Resources conducts Training Course on Hydrological Survey of Runoff Assessment.

Output and Outcome:

Participants gain knowledge and more understanding. They realize the importance of meteorological and hydrological works. It creates integrated cooperation between the Bureau of Research, Development, and Hydrology and the Water Resources Regional Office 1-11 in support and drives the operation powerfully and effectively.

Development of Information Technology System to pursue Public Services 4.0

Department of Water Resources has developed an information technology system following the Public Service 4.0 framework and Principles and Good Governance to pursue Public Service 4.0. There are two issues;

1. Open and Connectedness

The Department of Water Resources has analyzed information technology, and conduct IT system, and disclose information technology to the public such as database system, early warning system, telemetry system, CCTV, and hydrological data. Open government data is defined and published through www.dwr.go.th and http://data.go.th. Moreover, the Department of Water Resources has worked together with organizations under the Ministry of Natural Resources and Environment to analyze IT data about resources and public administration structure. There are meetings to brainstorm with agencies under the Ministry of Natural Resources and Environment. So, the Department of Water Resources has linked water resources data to the Ministry's Operation Center (MOC) and database of the Ministry of Natural Resources and Environment, and perform integrated monitoring and evaluation.

The Department of Water Resources has established the IT and Communication Management Committee, who is responsible for reviewing the work plan/projects of the internal departments. It is to ensure that work plan/projects will be in line and not overlap with all-level Strategies. The IT and Communication Management Committee of the Ministry of Natural Resources and Environment will consider the integration of data and also reduce the overlap of data at the ministry level.

2. People-centric Approach, High Competency, and Modern

Department of Water Resources has applied digital technology to improve the working process to be faster and more transparent. The technologies used in the government are s e-Bidding, BB EvMIS, Budget Bureau's Fix Cost, e-GP of Comptroller General's Department, Departmental Personnel Information System of Office of the Civil Service Commission, e-Project tracking, e-Monitoring, and e-Petition of Ministry of Natural Resources and Environment. Additionally, the Department of Water Resources has developed digital technology for applying in internal administration, information disclosure, and public services such as Electronic Document Control System, video conference, Internal Information Notification System, using QR code for reducing paper works, and online request support for water sources development projects through the website. The Department of Water Resources has developed a Mobile Application to link data and disseminate water resources information.

In the fiscal year 2018, the Department of Water Resources has conducted the information technology projects to support Thailand 4.0 policy focusing on comprehensive public service system and consistently to the Digital Development Plan for National Economic and Social Development. It aims to transform the traditional public sector into digital Government that emphasizes the utilization of digital technology for improving organizational management and digital public service, which service recipients can easily access the service. The Department of Water Resources performs two main projects consisting of;

1. Maintenance of Computer and Network System
2. Mobile Application Development

1) Maintenance of Computer and Network System

Department of Water Resources, as an agency on policy and management of water resources, has used technology and IT for supporting all areas of operation, management, and decision-making. It has applied information, geo-informatics, and mathematical model in systematic water resources management in the basin. The Department of Water Resources has developed an information system for water resources management, which can link numbers of multiplex water resources data and information from other sources.

Information technology plays an increasingly important role, but the computer system and networks or hardware is outdated. These cause insufficient capacity to support the increasing of usages. Moreover, the information system is not fully secured; for example, authentication services allow only authorized users access to the networks in different levels and use resources in the network system. However, its traffic network system still has a problem because of the outdated network devices such as hub and core switch. They are not efficient enough to support modern usages. It causes the network collision, delay in the network system, and cannot work at full capacity. The information system lacks of backup server with RAID Level 5 for backing up critical data. For these reasons, the Department of Water Resources has a high risk of data loss from the main server, which may affect the operations of all divisions in the organization.

Therefore, it is necessary to maintain and increase the capacity of the computer system and network by maintaining the hardware such as server and core network devices, tuning up equipment for proper use, updating the information of security devices to prevent emerging threats, replacing the efficient devices as well as optimizing the use of computer system and network in terms of providing proper devices to avoid the investment in infrastructure in hardware, software, applications which is difficult to install and maintain due to their high values and to keep the computer systems and water resources information networks are able to operate efficiently, fast, accurately and securely to support the use of water resources information at all time.

Output:

There are study, analysis, assessment, review, and configuration consisting of;

1. DWR's existing computer system and network.
2. Configuration
3. Appropriateness of the server room and recommendation for development
4. Design the linkage between the network system and the main server

Outcome:

The Department of Water Resources has maintained computer system and network to be more efficient. Officials can use computers and networks. Policy on information technology has been studied, reviewed, and improved.

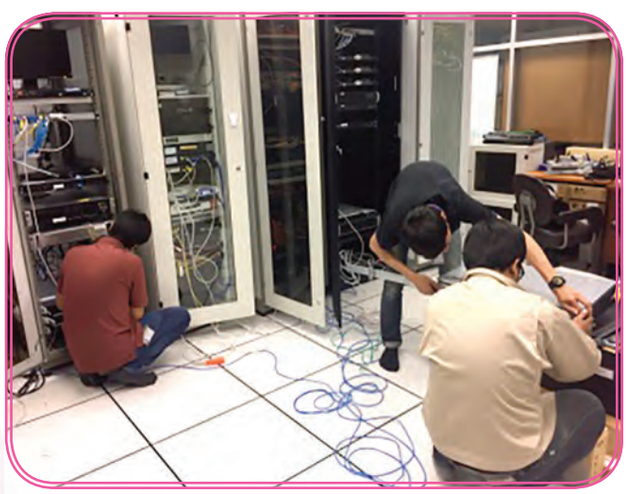
Successful Condition:

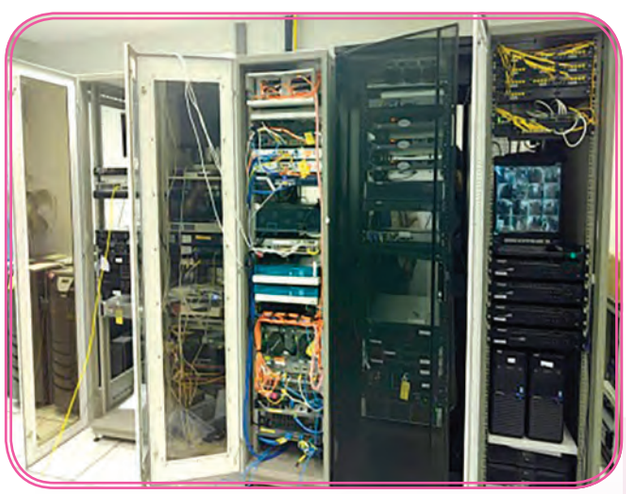
1. Policy on information technology has been studied, analyzed, reviewed to be consistent with changing of technology and meet the performance standard. Also, the practices are as planned.

2. Computer system and network of the Department of Water Resources has been maintained which are always ready for operation, and continually support uses of information technology system. The system is secured, effective, and meets the performance standard.

3. The information system has been backed up so the data can be recovered if the damage occurs. The traffic data is maintained appropriately according to the Computer-related Crime Act B.E. 2550.

4. Officials of the Department of Water Resources' knowledge about computer hardware and network have been increased.





2) Mobile Application Development

The Government has the policy to drive country development by the digital economy, which prioritizes the development of the mobile application of government agencies. People can download the app via mobile devices. This policy implementation requires government agencies to enhance public service system by developing service channels helping service recipients to easily access data and service from anywhere through the mobile application. It tangibly drives Thailand with the digital economy with a people-centric approach. Clients can receive accurate and reliable data, as well as a fast and convenient service. It also creates transparency of government agencies.

So, the Department of Water Resources has to develop a mobile application to connect the database from the existing information system. It is used to provide information and news, and e-Service to the clients through Government Application Center. It also supports an early warning system for water-related disasters and responds to the executives' needs as a tool for managing water resources effectively.

Output:

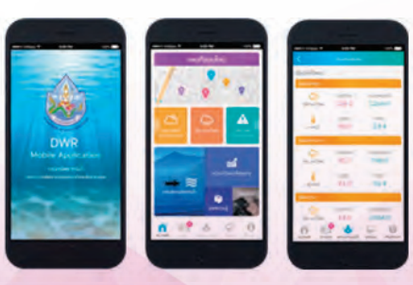
1. Analysis results/system requirement review consists of a summary of the client's requirement, information system design, data linking, and collection system for mobile application, data architecture design, mobile application design.
2. The prototype of data linking system and display on mobiles application such as the model of online map system, water situation, notification, news, project progress, knowledge on water resources management, and communication channel.

Outcome:

1. Department of Water Resources has a mobile application providing service to clients. People can follow the news of the Department of Water Resources and access to e-Service via mobile devices anywhere and anytime.
2. It supports an early warning system for water-related disasters and also responds to the executives' needs as a tool for managing water resources effectively.

Successful Condition:

1. People can follow the news of the Department of Water Resources and access to e-Service via mobile devices anywhere and anytime.
2. The Department of Water Resources has the application on mobile devices, which is used to support the current water resources situation monitoring. Executives and users can utilize the app in the analysis, surveillance, and warning of various situations that meet the needs and can access at all time.



3.7 Dissemination and Public relations on Water Resources

Dissemination and Public Relations on Water Resources

Water is a significant resource to the human living in terms of consumption, agriculture, and industry. In the past, the water resources were abundant both in quantity and quality causing more convenient for the human living because of adequate water resources. But at present, it is well-known globally that people are now facing the problem of water crisis. And it is constantly more severe such as flood, drought and wastewater are from the changing environmental conditions due to the increase in population results in water demand and water pollution problems which putting the water resources management at risk due to it is unable to support the future basic minimum needs.

Over the past years, Thailand has been facing severe water resource problems because of the global climate change, no rain in the areas that significantly need water and the heavy rainfall in some areas which is more than the demand of people. Besides, the deterioration of upstream forests which are the sources for water resources and the lands covering with abundant forest are encroached by highland people causing widespread water resources problems throughout the country. So, the

government has to take these problems seriously to manage the water resources for adequate use, maintain the equality and reduce the problems of water scarcity, flood, and wastewater.

Therefore, the Department of Water Resources is the agency that strives for the integrated water resources management in the river basin system by relying on people's participation with efficiency, equitability, and sustainability. The missions of DWR are the suggestions and formulation of policy and plan on water resources management, development, conservation and rehabilitation as well as surveillance, monitoring, evaluation and problem solving regarding the water resources including a study on academic and technological development concerning water resources both inside and outside the country including passing on the knowledge to people both in overall and river basin levels. Moreover, this project also requires the coordination of the work plan for monitoring and evaluating on the Royal Initiative and Special Projects. Besides, public relations is necessary to present beneficial missions of DWR to interested people via the mass media including radio, television, newspapers and other media types in order to disseminate the knowledge on water resources which results in the achievement of water resources management in the future.

Output:

To disseminate missions via radio, television, and exhibitions and encourage people to respond through the satisfaction survey, questionnaires and join a radio channel as well as participate in the activities according to the project planning.

Outcome:

People acknowledged the missions of DWR, realized the value of water and received drought, flood and landslide warning promptly. In addition, people learned more about how to access more information from DWR.

3.8 Water Resources Conservation, Rehabilitation and development

The Department of Water Resources has carried out the maintenance and rehabilitation of natural water sources in small, medium and large scales; there are swamps, marshes, rivers and canals or others which have similar features. The operations are divided into the areas for rehabilitation and conservation or dividing by the mainstream or tributaries with the elements such as dredging, weed control, erosion protection, and control building. DWR operations have objectives to maintain the ecosystem and enhance the efficiency of water storage capacity, distribution and drainage as well as to make those areas become the source of water budget for consumption, agriculture, and occupation and also can solve or alleviate the water resources problems for people as well as to prevent and mitigate the flood and drought problems and become the defensive line to prevent the encroachment to the natural water sources areas.By using the systematically guidelines for operations conform to the river basin level and the local level in respond to the need of people in that area including, the promotion of participation of all sectors and focusing on the stakeholders as well as supporting people to make benefits from the water sources under the concept of sustainability.

Performance Result

Indicators	Counting Units	2018	
		Plan	Result (At 30th September 2018)
1. Number of water sources that have been developed, improved efficiency and renovated.	Places	22	22
2. Number of households that have been received benefits from water resources development, efficiency improvement, and maintenance.	Households	485	8,942
3. Number of water sources that have been conserved and rehabilitated.	Places	388*	172*

* fiscal year of B.E. 2561 (2018): 10 place. In addition, there was a termination of project contracts: 2 places and the projects are needed to carry on around 376 places at the end of the budget in fiscal year of B.E. 2561 (2018) which already completed 172 places and 204 places left to be carried out constantly according to the project contracts (The reserved budget for disbursements in overlapping fiscal year 2019). Moreover, the benefits that will be receiving after 376 places of water resources conservation, rehabilitation and development projects have been done completely are as follows;

1. The amount of water storage capacity: 141.70 m^3
2. The number of households that receive benefits: 124,383 households
3. The number of areas that receive benefit: 200,730 rai

The Department of Water Resources has carried out the water resources conservation, rehabilitation and development projects covering the areas in different provinces of Thailand. For examples;

1. Nongthum Water Resources Conservation and Rehabilitation Project: Phase 2 ,Moo 3 ,Ko Pho Subdistrict, Mueang District, Uthai Thani Province

Nongthum Water Resources Conservation and Rehabilitation Project: Phase 2 has objective to enhance the water storage capacity, distribution and drainage to become the source of water budget for consumption, production, agriculture and occupation as well as people can have adequate water use for their benefits. Moreover, this can help to solve and alleviate the water resources problems for people in order to prevent and mitigate the flood and drought problems and become the defensive lines to prevent the encroachment to natural water sources areas.

Output and outcome:

The implementation on Nongthum Water Resources Conservation and Rehabilitation Project: Phase 2 is for enhancing the water quantity in water sources around 463,285 m^3, having more water budget to supply for the consumption of people in the project areas around 95 households and supporting the cultivation in the area of 980 rais as well as alleviating the drought, maintaining the aquatic ecosystem and becoming the source of aquaculture.

Successful Condition:

The participation among government sector, local sector and people to carry out the project according to the goal.



2. Nong Wai Water Resources Conservation and Rehabilitation Project, Ban Phon Sawan, Moo 1, Phon Sawan Subdistrict, Phon Sawan District, Nakhon Phanom Province

Nong Wai Water Resources Conservation and Rehabilitation Project is the water source for the community of Ban Phon Sawan. At present, people need to use water from Nong Wai Project for the agriculture and consumption but the condition of the swamp is currently shallow and never been under the maintenance for so long causing the capacity to store water for adequate use. Therefore, DWR has been carried out the project to enhance the capacity of the water sources to store water for people to use.

Output and outcome:

The implementation on Nong Wai Water Resources Conservation and Rehabilitation Project is for enhancing the water storage capacity for water sources so that people can use water for their consumption and agriculture as well as it also helps to alleviate the flood and drought problems.

Successful Condition:

The implementing areas have to be ready together with the participation of the local agencies and people in the areas to solve problems and overcome obstacles.

3. Nong Wan Water Resources Conservation and Rehabilitation Project, Ban Muad-aeh, Non-Sa-at Subdistrict, Chum Pae District, Khon Kaen Province

Due to almost all of the local people in the area they are farmers and they make a living such as planting and vegetable cultivating. Therefore, water is significant and necessary for the plantation. However, currently people still face the problems of water scarcity for consumption in their villages, agriculture and domestication. So, it is necessary to use water from water sources. But the problem now is the water source is shallow due to the large amount of siltation and weeds causing the capacity to store more water to supply in the drought season so that it is unable to store water at its maximum capacity during the flood season. Hence, it causes the serious impact on the properties and agricultural areas.

Output and outcome:

The implementation on Nong Wan Water Resources Conservation and Rehabilitation Project is for solving water scarcity for consumption, agriculture and domestication during the drought season and enhancing the storage capacity in the flood season. So, the beneficial areas are approximately 430 rai and 690 households as well the capacity increasing about 0.20 m^3. Moreover, it will also become the aquaculture sources for people in the areas as well as rehabilitate the natural watercourse to enhance its storage capacity and maintain the ecosystem.

Successful Condition:

The project helps to problems for people in the areas in respond to the strategic plans on water resources management for helping people to have water budget to supply water for consumption as well as alleviate the flood problems in rainy season by relying on the participation of all people in the project areas.




4. Huai Cha Kae Si Pheod Water Resources Conservation and Rehabilitation Project, Moo 2,3,4,5,6,7, Kan Tuat Ra Muan Subdistrict, Prasat District, Surin Province

Huai Cha Kae Si Pheod Conservation and Rehabilitation Project is located in Lam Chi which is a tributary of the Mun River with the water source area of 300 rai. The current condition of the water source is containing aquatic weeds and siltation affecting the shallower comparing to the average of the previous depth is 1.5 meters. So, it is unable to store water efficiently causing water scarcity during drought season.

Output and outcome:

The implementation of Huai Cha Kae Si Pheod Water Resources Conservation and Rehabilitation Project is for solving the water scarcity problems during drought season and enhancing the efficiency of storage capacity at 530,000 m^3. The agricultural areas receives benefits approximately 540 rai and 240 households also receive benefits as well as it helps to maintain aquatic ecosystem and biodiversity and also becomes the source of aquaculture.

Successful Condition:

Before the implementation of the project, DWR has been opened to receive the opinions and suggestions from people in the areas and there is no complaint about the project at all. At the same time, people also set up their working group to help monitoring the project areas by receiving support from the village committee to jointly take care of the project.




5. Project of Spillway Construction in Khlong Hin Chuang, Moo 12, Huai Yang Subdistrict, Tab Sakae District, Prachuabkirikhan Province

The Project of Spillway Construction in Khlong Hin Chuang, the current condition is unable to store water at its maximum capacity results in water scarcity problem during drought season due to it is unable to supply water efficiently for consumption and agriculture for people living in Huai Yang Subdistrict.

Output and outcome:

The implementation of Project of Spillway Construction in Khlong Hin Chuang is to solve the problem of water scarcity for consumption and agriculture for people living in Huai Yang Subdistrict. So, they can have adequate water to use for their consumption during the drought season with more capacity of 18,900 m^3, the agricultural areas receive benefits around 25 rais as well as 100 of households also receive benefits.

Successful Condition:

The participation of people and local administrative organization to carry out the project to achieve the goal.

6. Mae Li Phai Water Resources Conservation and Rehabilitation Project, Ban Na Yum, Khu Subdistrict, Chana District, Songkhla Province

According to the conditions of the areas at Ban Na Yum, Khu Subdistrict, Chana District in Songkhla Province, almost all of people in the area are farmers and they use water from Li Phai canal which its stream flows through the village. During the flood season, the water level is very high and flows into the temporary canal excavation that local people jointly help to excavate to deliver water to their farmlands. Moreover, there is no a water management system or water control gates causing the farming and related agricultural works in the area struggle with unworthy productivity which affects the stability of income and livelihood of people.

Output and outcome:

The implementation of Mae Li Phai Water Resources Conservation and Rehabilitation Project is for solving flood problem and becoming the source of water storage for drought season. The beneficial areas are more than 250 rais, local people who do farming and related agricultural works can increase yield of agricultural production per rai, better quality of productivity and quality of life which more than 120 households earning more than 2,000 baht/month/household. In addition, it also becomes the source of water retention to mitigate the drought problem as well as be the retention areas during the rainy season for people in Ban Na Yum and the areas nearby Chana District in Songkhla Province.

7. Water Resources Conservation and Rehabilitation Project of Huai Ta Rung Reservoir, Moo 6, Ban Nam Chut Noi Subdistrict, Kra Buri District, Ranong Province

Huai Ta Rung Reservoir is natural water source which located in Moo 6, Ban Nam Chut Noi Subdistrict, Kra Buri District, Ranong Province. The condition of the area is shallow and covered with weeds. During flood season, the water level is very high but it is unable to retain any water quantity. Besides, during drought season, there is water scarcity for consumption and agriculture. So, the local people have been struggling with this problem every year.

Output and outcome:

The implementation on Water Resources Conservation and Rehabilitation Project of Huai Ta Rung Reservoir is for solving water scarcity problem for people in the area, so they receive benefits 55 households and the agricultural areas receive benefit 550 rai. Moreover, this project will be applied to the water supply system in the future.




8. Water Resources Conservation and Rehabilitation Project of Huai Rua Dam, Tha Hai Subdistrict, Khueang Nai District, Ubon Ratchathani Province

Huai Rua Dam is the important water source for people in Tha Hai Subdistrict, Khueang Nai District, Ubon Ratchathani Province. The area condition is shallow and during the drought season it is unable to retain any water quantity so there is no adequate water in response to the water demand for building water supply system for the village causing the problem of water scarcity for consumption and agriculture.

Output and outcome:

The implementation on Water Resources Conservation and Rehabilitation Project of Huai Rua Dam is for solving the problem of water scarcity for consumption and agriculture, maintaining and creating the balance of ecosystem as well as restoring the natural integrity. This project has improved the water capacity of 33,203 m^3, 525 rai of farming areas and 250 households also receive benefits.




9. The maintenance Project of Huai Lan Reservoir and Water Distribution System, Moo 8, Mae On Tai Subdistrict, San Kamphaeng District, Chiang Mai Province

Huai Lan Reservoir had constructed since 1987 and DWR had renovated this reservoir in the fiscal year 2015 by dredging the front area of the reservoir and constructing the water distribution system. In the fiscal year 2018, DWR has been carrying out the maintenance project of Huai Lan Reservoir and Water Distribution System to enhance retention capacity.

Output and outcome:

DWR has been carrying out the maintenance project of Huai Lan Reservoir and Water Distribution System to expand the Water Distribution System to cover the agricultural areas and to solve the problems of people in the area. Therefore, 150 households receive benefits with farming areas of 3,700 rai.




10. The maintenance Project of Huai Tang Weir and Water Distribution System, Ban Pa Pru, Moo 2, Pa Pru Subdistrict, Ban Hong District, Lamphun Province

Huai Tang Weir had constructed since 1997 and had been using for a very long time. The current condition of the weir is in disrepair and the existing water distribution system is unlined canal, so it is unable to deliver water to the agricultural areas at its maximum capacity. Therefore, people living in the beneficial areas are still suffering from such problem.

Output and outcome:

DWR has carried out the maintenance Project of Huai Tang Weir and Water Distribution System to cover the agricultural areas of people, so Huai Tang Weir can be used at its maximum capacity and people receive benefit around 550 households with the agricultural areas of 1,500 rai.

11. Klong Phi Son Water Resources Conservation and Rehabilitation Project and the Construction Project of Water Distribution System, Moo 5, Singha Nart Subdistrict, Lat Bua Luang District, Phranakorn Sri Ayutthaya Province

Klong Phi Son is the water source of drainage canals located in Moo 5, Singha Nart Subdistrict, Lat Bua Luang District, Phranakorn Sri Ayutthaya Province which has water flow throughout the year. People in this beneficial area use water for their homegrown vegetables such as wildbetel leafbush, pandan, lemongrass, basil, sweet basil, chili, Chinese morning glory, banana and cane. However, the area is a highland and far away from the water source so it is difficult for people to bring water to use.

Output and outcome:

DWR has carried out the construction project of the water distribution system to deliver water for the farmers in remote areas so they can use water thoroughly. Moreover, this project also supports the farmers to grow economic plants by using less water in non-irrigated areas during drought season. For this reason, 13 households receiving benefits with beneficial areas of 23 rai as well as the nearby areas of water source also receive benefits.

12. The Project of Huai Sam Pad Water Distribution System, Ban Pa Kham, Ban Tad Subdistrict, Mueang District, Udon Thani Province

Huai Sam Pad is the important water source of Ban Tad Subdistrict. People in the area do farming throughout the year but still cannot bring water to use efficiently. So, Ban Tad Subdistrict Municipality has required the support for construction project of water distribution system with solar power to better manage the water resources to create the highest benefit for farmers in the areas as well as to reduce the cost of production for agricultural water user groups.

Output and outcome:

The implementation on the Project of Huai Sam Pad Water Distribution System is for managing the water resources in order to create the highest benefit for farmers in the areas, reduce cost of production for agricultural water user groups, deliver water budget to water supply system in the villages and increase productivity of growing economic plants by using less water during the drought season. Therefore, the farmers and water user groups can increase more income.

Successful Condition:

The readiness of the implementing areas and the participation of local people and agencies as well as the readiness of the contractors to carry out the work in all aspects.

13. The Project of Ban Don Yao Noi Water Distribution System, Moo 6, Wang Hin Subdistrict, Non Daeng District, Nakornratchasrima Province

Ban Don Yao Noi water source has storage capacity around 150,000 m^3 and people in the area receive benefits from raw water sources for their consumption and small scale of agriculture. According to the government policy, DWR has carried out the water distribution system with solar power in order to bring water that has been developed, improved and rehabilitated already from the water source to support farmers for their homegrown vegetables, economic plants growing and make a living by using less water such as growing chili, corn, string bean, kale, cabbage and coriander.

Output and outcome:

The implementation on the Project of Ban Don Yao Noi Water Distribution System is for supporting farmers to bring water that has been developed, improved and rehabilitated already from the water source and deliver to the agricultural land plots for growing plants by using less water. Therefore, it helps to increase agricultural productivity for farmers around 105 rais and people receive benefit 60 households.

Successful Condition:

Local people have set up a group of water users to manage and share the water use as well as monitor and preserve the pumps and solar cells.




14. Ban Kok Ka Ton Water Resources Conservation and Rehabilitation Project with Water Distribution System, Moo 10, Lad Ta Kean Subdistrict, Kabinburi District, Prachin Buri Province

Ban Kok Ka Ton Water Resources Conservation and Rehabilitation Project with Water Distribution System is the source of water budget for the village's water supply production so people can use water for their consumption and agriculture. The condition of the water source is small and shallow. Therefore, DWR has carried out this project to alleviate the drought problem.

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DWR has dredged the water source together with constructed the solar-powered water distribution system with the pumping rate of 100 m^3 around Ban Kok Ka Ton water source. By using the solar power, water is pumped up to the high water tank with the capacity of 20 m^3 and further distributed via PVC pipes: diameter 4 inches and length 100 meters. After that, the water is delivered for available agricultural use with the storage capacity of 351,000 m^3, so people can have water budget for their consumption and agricultural works which totally 614 households and agricultural areas of 123 rai receive benefits.

Successful Condition:

Promote the participation of government sector and people, hold the training for local administrative organization and water users to enhance the knowledge of the use and maintenance of the project as well as create the cooperation among local people to conserve the water source for further sustainability.

15. Hin Tha Lu Water Resources Conservation and Rehabilitation Project, Moo 9, Pak Chan Subdistrict, Kra Buri District, Ranong Province

Hin Tha Lu dam is a natural water source that directly supplies water for the consumption of local people and has water flows throughout the year. Pak Chan Subdistrict Administrative Organization has reported about the water scarcity and required support from DWR to construct the water distribution system to supply water from the upstream (Hin Tha Lu dam) to apply to the water supply system of Pak Chan Subdistrict to alleviate the problem of water scarcity.

Output and outcome:

The implementation of Hin Tha Lu Water Resources Conservation and Rehabilitation Project is for mitigating the drought and flood problems which 49 households and agricultural areas of 490 rai receive benefits.

Successful Condition:

The cooperation between government agency and local agency to achieve the goal.

16. The Project of Huai Yai Water Distribution System, Ban Non Kaeng, Moo 5, Tob Hu Subdistrict, Det Udom District, Ubon Ratchathani Province

The Department of Water Resource has a policy to conserve, improve and rehabilitate the water sources to be used at its highest benefit. So, people can use water for their agricultural plantations and create more income after harvesting season by focusing on growing short-lived plants by using less water to create value-added for the farmers in the area.

Output and outcome:

The Implementation on the Project of Huai Yai Water Distribution System is for supporting the groups of farmers to use water for their agricultural plantations and create more income after harvesting season. DWR has constructed the water distribution system with solar power, capacity of minimum 100 m^3/day to supply water for agricultural use of the village together by reducing the cost of production due to there is no electrical charge of Provincial Electricity Authority to be involved. Moreover, there is also adequate water quantity to be used for agricultural works throughout the seasons with capacity of 336,483 m^3 and agricultural areas of 25 rai (which tends to increase). In addition, there is a Joint Management Committee for the water user groups which has 15 members and the members of water user groups are totally 63 members and they can create additional income at the average of 100-150 baht/day/person.

Successful Condition:

The MOU between DWR and Tob Hu Subdistrict Administrative Organization, Det Udom District, Ubon Ratchathani Province and this project also requires the inspection, monitoring, and performance evaluation periodically.




17. Tha Khoei-Huai Ma Hat Reservoir Water Resources Conservation and Rehabilitation Project with Water Distribution System, Ban Bueng and Nong Phan Chan Subdistrict, Ban Kha District, Ratchaburi Province

Tha Khoei-Huai Ma Hat Reservoir Water Resources Conservation and Rehabilitation Project with Water Distribution System is the project for systematically solve flood, drought and water scarcity problems in economic areas and urban community by distributing water across tributary from Tha Khoei Reservoir which previously have water quantity left only 10 million m^3 to Huai Ma Hat Reservoir. This project is the continuous project of Huai Mai Teng Water Resources Conservation and Rehabilitation Project that distributes water from Huai Ma Hat Reservoir to Tung Hin Sri Reservoir Sam Nak Huai Mai Teng Reservoir.

Output and outcome:

The Implementation on the Construction Project of Supply Pipes from Tha Khoei Reservoir to Huai Ma Hat Reservoir by delivering water via steel pipes, the size of 800 mm in diameter and 10,270 meters in length and delivering water via fiberglass pipes, the size of 800 mm in diameter and 11,870 meters in length. And DWR has constructed vent pipe buildings: 36 places, sludge drain buildings: 37 places and the buildings of appurtenant structures of intake pipes: 2 places. Therefore, this project can increase water budget for Huai Ma Hat Reservoir and Huai Ma Hat Reservoir and solve and alleviate flood and drought problems for Lum Pha Chi River Basin around 50,220 rai. In addition, this project supports the agricultural works of local people in the project area around 3,561 households so they can do more farming as well as it also helps to conserve and rehabilitate the ecosystem of water source in the area properly.

Successful Condition:

The cooperation on integrated water resources management between the Department of Water Resources and the Royal Irrigation Department




18. The maintenance Project of Wiang Wai Weir, Ban Wiang Wai, Meng Rai Subdistrict, Phaya Meng Rai District, Chiang Rai Province

Wiang Wai Weir had constructed since 1996 and the weir had been operating for so long so that the main building and supplements as well as the general condition of the project have fallen into in disrepair due to lack of maintenance.

Output and outcome:

DWR has carried out the Maintenance Project of Wiang Wai Weir for available use at its maximum capacity to benefit the water resources management. Moreover, DWR has transferred this project to the Local Administrative Organization for further use and maintenance. Therefore, 2,000 rai of agricultural areas have received benefits.

Successful Condition:

The cooperation between people and local organizations for better water resources management including joint monitoring to maintain the tools and equipment

19. The Maintenance Project of Ban Huai Yai Weir, Ban Huai Yai, Moo 10, Soi Lakorn Subdistrict, Lat Yao District, Nakornsawan Province

The Department of Water Resources has carried out the maintenance project of water source to maintain the condition or the balance of ecosystem or natural environment as well as enhance the capacity of water storage, distribution and drainage including become the source of water budget to supply adequate water use for consumption, production, agriculture and occupation. Moreover, the project also helps to solve and alleviate the water resources problem for people as well as prevent and mitigate the flood and drought problems including become the defensive line to prevent the encroachment to the natural water sources areas. However, when the project has been operating for some time, it may be shallower and the tools may be out of order. Therefore, the project is required the maintenance to make it available for further use.

Output and outcome:

The Implementation on the Maintenance Project of Ban Huai Yai Weir has increased the source of water budget for the consumption of people in the area around 180 households as well as also supported the agricultural plantations of 50 rai, fishery in the areas around 70 households. Moreover, it also helps to mitigate the drought, maintain the aquatic ecosystem and become the aquaculture.




20. The Water Resources Maintenance Project of Ban Non Thong, Ban Non Thong, Wang Kra Cha Subdistrict, Pak Chong District, Nakorn Ratchasima Province

The Water Resources Maintenance Project of Ban Non Thong is in Lam Phra Phloeng river basin which is the main river basin of Mun River. The condition of spillway and stilling basin of the drain buildings are out of order and unable to store water for the consumption of people during drought season. Due to the spillways made from box culvert consists of 2 holes are collapsed so that the water outlet is getting eroded and causes a serious damage since it has been operating for so long and covering with trees and weeds.

Output and outcome:

The implementation on the Water Resources Maintenance Project of Ban Non Thong is for storing water for the consumption throughout the drought season and supporting the water source to store more water at its maximum capacity in respond to the use of people in the area. In addition, this project also sustainably supports the water resources management for the community by supplying the water budget for consumption along with mitigating the drought, supporting the agricultural areas and maintaining the aquatic ecosystem as well as biodiversity.

Successful Condition:

People in the area help to monitor and maintain the project and also set up a water user group by receiving support from the village committee to monitor the project together sustainably.

3.9 The Early Warning and Hydrology

The implementation of Department of Water Resources has been carried out according to the work plan/project for measuring, collecting, monitoring and disseminating the information of daily report of water situation. Therefore, people can directly track the Daily report on Water Resources Situation, Situation Report of Flood Risk Areas on Foothill Side Slopes, Situation report of River Basins from Telemetering System and CCTV System, Daily Situation Report on Rainfall-Runoff and Report on Flood and Drought Assistances from the website http://www.dwr.go.th

The Department of Water Resources has received budget to enhance the efficiency of water resources forecasting and early warning system in 3 projects as follows;

1. The Project Management to Tackle Water Crisis

2. The Maintenance Project of Telemetering system, CCTV system, Early Warning system and Mekong-HYCOS

3. The Project of Discharge and Suspended Sediment Transport Measurements on the Mekong Mainstream

1. The Project Management to Tackle Water Crisis

The Department of Water Resources has carried out the project management for preparing to tackle the water crisis since 2013. And the project helped a lot of people who suffering from flood and drought problems in DWR responsible areas (the areas of Water Resources Regional office 1-11) by supporting tools, equipment and durable articles to solve the water crisis such as pumping machines with the minimum size of 8-30 inches, water trucks, field water supply machine and water production machine.

Overall pictures of drought assistances

Output:

The operational result of such project can help to mitigate flood and drought crisis in farmland around 66,512 rais and also support the consumption of 55,775 households (167,109 people) with the pumping rate of 24,265,590 m^3.

Outcome:

People who are affected by flood and drought crisis are satisfied with DWR assistance to alleviate the situation. And the project also signifies the important of integrated operation among the relevant agencies.

Successful Condition:

1. Preparation of tools to be available for using and the preparation meeting for tackling drought and flood crisis

2. Establishment of Administrative Flood Monitoring and Resolution Centre to support the works of Water Resources Regional Office 1-11 and working group to monitor and follow up the project management to tackle the water crisis as well as the integrated operation among related agencies

3. The report on operational progress, problems, obstacles and budget expenditures as well as the periodic follow-up meeting on operational progress and preparation of performance report

4. The evaluation from the questionnaire which the target groups consist of Water Resources Regional Office 1-11 sector, Local Administrative Organization and people who are experienced the water crisis

Overall pictures of drought assistances



2. The Maintenance Project of Telemetering system, CCTV system, Early Warning system and Mekong-HYCOS

The Department of Water Resources has carried out the study, survey and installation of the telemetering system and CCTV system in order to monitor, forecast and provide the early warning for different river basins approximately 182 stations since the fiscal year 2006-2016. The project of early warning system installation for flood and landslide risk areas on foothill side slopes and foothill plains has been completed since the fiscal year 2005-2015 approximately 1,546 stations. Moreover, the maintenance project of Mekong-HYCOS has been completed approximately 11 stations by receiving the tools and transferring mission from Mekong River Commission Secretariat: MRCS so that the project of Mekong-HYCOS has been started since 2012.

The telemetering stations and early warning stations are located in the opened areas and also required maintenance of the electronic equipment continuously for available use and maintain the efficiency. Therefore, they also need operational monitoring, maintenance of the systems and communication of data system continuously. Therefore, when the crisis occurs they will be available to monitor and provide early warning at full capacity and can reduce severe damage to life and property of people in vulnerable areas.

Performance result:

182 of telemetering stations, the surveillance of water level in different river basins through CCTV system approximately 75 stations, early warning system (EWS) for flood and landslide risk areas on foothill side slopes and foothill plains approximately 1,546 stations, the follow-up on information and Mekong-HYCOS around 11 stations which the DWR officers who are in charged for the surveillance work every day without any official holidays. During rainy season or in some water situation, the officers will monitor the early warning system through Line Application group named “DWR Flood Center”, “DWR Incident Action” and “NWCC” to provide early warning in a timely manner according to the mission of DWR and prepare for the daily report on water resources situation. Moreover, interested people can follow up all of this information from the situation report on early warning and daily report on water resources situation at website http://www.dwr.go.th.

The surveillance result to prepare for tackling the crisis and emergency in the fiscal year 2018 has been carried out on the following table;

Indicator	Counting Unit	Fiscal year 2018	
		Plan	Result (At 30 September 2018)
1. Number of village that receives efficiency increasing and maintenance of the early warning system	Village	1,546	4,911
2. Number of residents who receive the early warning information of flood and flash flood on time	Percentage	80	100*

* The notification of early warning information on flood and flash flood in a timely manner means when the early warning sign is at evacuation level (Red Color), it corresponds to the occurrence of flood and flash flood incidents stated in the flood incident report of Department of Disaster Prevention and Mitigation, newspaper, medias and news from local agencies.

Output:

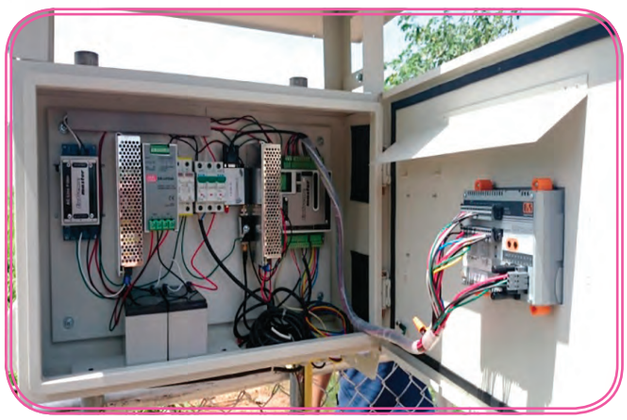
1. Data series of water quantity from telemetering system approximately 182 stations that have been reported to the Water Crisis Center and processed by a mathematical model to track the water quantity in the Ping, Wang, Yom, Nan, Chao Phraya, Tha Chin, Pasak, Sakae Krang, Bang Prakong, Prachinburi, Khong, Chi, Mun and Songkhla lake to prepare situation report for executives.

2. Data series of water level at measurement spot that have been installed the CCTV system approximate 75 stations to report the real-time data back to the main station for evaluating and warning the downstream stations to acknowledge the water movement information and prepare to support in different cases.

3. Data series of early warnings system (EWS) for flood and landslide risk areas on foothill side slopes and foothill plains approximately 1,546 stations that have been providing the early warning in different levels around 1,133 times covering the areas of 4,003 villages as follows;

- Monitoring Level (Green Color) 576 times, covering 2,065 villages
- Preparedness Level (Yellow Color) 403 times, covering 1,409 villages
- Evacuation Level (Red Color) 154 times, covering 529 villages

4. Data series of water level from Mekong-HYCOS consist of manual information, GPRS information, data analysis and performance report on the implementation of the MRC Secretariat in every four months.



Outcome:

1. People in vulnerable areas receive early warning information on time

2. People can track the information of water resources situation of DWR via different media

3. Relevant agencies can bring the information from the measurement to apply to the water situation tracking, surveillance, warning and decision making to support people in vulnerable areas

Successful Condition:

The maintenance of the stations for available and efficiently use at all the time is important in order to track, store, collect and analyze the data for situation report and surveillance.

3. The Project of Discharge and Suspended Sediment Transport Measurements in Mekong Mainstream

The Department of Water Resources jointly coordinate by Mekong River Commission Secretariat: MRCS to implement the project of the discharge and suspended sediment transport measurements in Mekong mainstream to improve the rating curve and develop methods for measuring, collecting and storing the data of water level, discharge, suspended sediment transport, bed load and the erosion conditions of Mekong River for making it more accurate and reliable and ensure the amount of sediment is in relation to runoff. Therefore, it is required to survey and measure due to the amount of sediment implies changes which results in the data analysis and can be applied for planning, developing, managing the water resources, environment and Mekong ecosystem by the integration of Thai-Lao PDR. Therefore, there are 6 stations have been implemented such as Mekong River station at Chiang Saen District in Chiang Rai Province, Mekong station at Chiang Khan in Loei Province, Mekong station at Mueang District in Nong Khai Province, Mekong station at Mueang District in Nakorn Phanom Province, Mekong station at Mueang District in Mukdahan Province and Mekong station at Khong Chiem District in Ubon Ratchathani Province. In addition, previously the MCRS was the focal point and it transferred the mission to DWR since 2015.

Performance result:

The Hydrological Division of Water Resources Regional Offices administer by Department of Water Resources has carried out water level and volume measurement, sediment transport and bed load measurement, survey of the cross-section, data analysis, maintenance of tools and equipment in order to report the operational result and information to Bureau of Research, Development and Hydrology to process the data and report to MRCS.

This project is the collaboration between Thai and Lao PDR and consists of 6 stations which the Thai side has been supporting the vessels and measuring tools such as current meter, grab sampler, distance meter, global positioning system, stopwatch and computer for 5 stations except the Mekong station in Nakorn Phanom Province has an agreement to use the vessel of LAO PDR support for measurement.

Output:

Data series of surveillance information on water situation in Mekong River's mainstream which consists of water level, water volume, sediment transfer, bed load, and cross-section data.

Outcome:

The survey data is accurate, reliable and on time and can be applied efficiently to the monitoring, surveillance and forecast of the water situation in Mekong River Basin to create more benefit for people in the target areas (which is the areas of 8 provinces nearby Mekong River of Thailand and the Lower Mekong areas of member countries such as Lao PDR, Cambodia, and Vietnam).

Successful condition:

The cooperation between the officers of Thai and Lao PDR

Summary of Problems, Obstacles/Suggestions

1. River basin management and participation plans

Problems & Obstacles:

1. Time limitation to raise the awareness of people on the important days of water resources so that the ongoing stimulation or encouragement to create more awareness are disconnected and not cover the target group in all area

2. Time frame of formulating the strategic plan on water resources management in river basin area and the integrated water resources operational plan of DWR not conform to the time frame of province and provincial clusters so this requires to accelerate the planning process

Suggestions:

1. Hold the events/activities on the important days of water resources and encourage every province to support the activity

2. Focus on the use of media for public relations and dissemination on the important days of water resources and National River Conservation Day to make it modern, up to date and gain more reputation for maximum benefit

3. Adjust the water resources management plans according to the provincial and provincial cluster plans so that 25 river basins can have water resources management plan that conform to the national water resources management strategies to tackle problems in the areas including the each work plan/project that has been approved by River Basin Organizations in all levels and already received budget should be monitored and evaluated

4. Support the establishment of water users/network including strengthening the capacity building in order to manage water resources in the area effectively

2. Foreign Affairs

Problems & Obstacles:

1. Some projects are regional implementation so the plan must be adjusted to conform to the current situation.

2. Most operations are performed with other agencies. Therefore, DWR cannot control the operation and budget allocation comprehensively.

3. Projects in cooperation with the member countries and other agencies still lack of budget integration.

4. Operational duration cannot be assumed regarding the exchange rate will be lower or higher than estimated budget.

5. Operation process takes several steps to receive the budget.

6. Coordination from the organizer is delayed, resulting in efficient preparation.

7. Participation in the international conference apart from the budget set for temporary visit abroad plan requires approval to transfer budget which takes time to process and beyond control.

8. Joint agency does not receive budget support for the international river basin representatives such as travel and accommodation costs. Therefore, the number of foreign participants is limited.

9. Ministry of Finance has revised the Government Procurement and Supplies Management Act B.E.2560 (2017), requiring modifications of the TOR to conform to new regulation causing the process of procurement of project management consultant (PMC) slower than planned. As a result, the implementation and disbursement do not go as a plan of the fiscal year 2018 which is the external factors that cannot control.

10. The budget allocation for the study of impact and monitoring of the significant environmental impacts is quite limited comparing to the amount of works required to complete as the scope of TOR, resulting in the data from the study is not yet completed in every area.

Suggestions:

1. The promotion and support for the implementation should be put into action in order to meet contractual obligations and jointly take action following Lower Mekong Initiative: LMI regarding the mission transfer of river basin management to the MRC member countries to develop an integrated water resources management by encouraging people's participation to create further sustainability in Mekong River Basin of Thailand.

2. The mission of the international cooperation requires continuous coordination and participation in the activities to lead more concrete collaboration through various forms of cooperation such as bilateral and multilateral cooperation, operation as a member of international organizations including participation in knowledge and experiences exchange on water resources with other foreign agencies in order to bring technology and best practices into the water resources management of Thailand. Therefore, the program of personnel development and capacity building has to be more efficient and qualified enough to drive the international cooperation which resulting in the movement of international cooperation on water resources and broaden the scopes of cooperation.

3. Cooperative activities in this manner should be implemented with other agencies / international organizations to create more benefit in both capacity building and strengthening international cooperation.

4. The study of impact and monitoring of cross-border environmental impact should receive the budget allocation continuously and increasingly in every year due to it is a continuing study project for 15 years. So, the adequate budget is required to be allocated properly to the actual study in order to get accurate data which is acceptable and can be put into practice.

3. Organizational and personnel Capacity Building

Suggestions:

1. The capacity building on the survey of water resources development, conservation and rehabilitation project design supporting the use of the standard model so that, the project should be implemented continuously in order to develop and enhance knowledge and understanding to put into practice quickly and efficiently.

2. The capacity building on the survey of meteorological and hydrological survey data should continue to enhance knowledge and understanding in order to obtain accurate and reliable information to optimize the standard.

3. The computer systems and networks should be maintained regularly every year.

4. Due to DWR may need to amend the mission in the future, so the Mobile Application should be improved in order to let people know about the missions of DWR and recognize the value of water use as well as they can access more news and information from DWR.

4. Water Resources Conservation, Rehabilitation and Development

Problems & Obstacles:

1. The problem of seasonal flood in the project area results in the problem of contractors request to stop their construction during that period of time.

2. Some projects have requested for the approval to amend the construction drawing to meet the demand of stakeholders in the areas such as water control building and road construction around the project including the problem of construction line is encroaching to the farmland. Therefore, there is a need to amend the construction drawing to conform to the state of the construction area as well.

3. The construction of water source with water distribution system helps to increase the cost of water budget of the reservoir but people in the area still have some concerns about the water diversion that may impact the problem of water scarcity for agriculture.

Suggestions:

1. The integration among agencies regarding the cultivation of field crops, horticulture and livestock in order to support and provide knowledge and advice to the members of water users

2. The project of water distribution system with solar water should have sufficient water pipes according to a number of cultivation areas in respond to the use of people in the area.

3. The budget for the maintenance of the water resources construction should set up for self-implementing in order to pay for materials, painting, stone stacking and hiring workers for mowing annually.

4. The management of water use from reservoir diversion should be implemented to meet the need of people in the project area and also create understanding about water allocation for people.

Part 3

Financial Report

Financial Report

DWR Financial Report
Financial status report
As of September 30, 2018

(Unit : Baht)

	2018	2017
Asset		
Current assets		
Cash and cash equivalents	59,034,841.93	82,861,431.43
Short-term receivables	139,517,322.02	66,247,184.85
Balance of goods	21,129,052.86	24,203,464.27
Other current asset	48,170.70	1,563,149.21
Total Current Asset	**219,729,387.51**	**174,875,229.76**
Non-current assets		
Long-term receivables	4,543.74	12,943.74
Buildings, lands and equipment	3,314,779,940.87	3,816,164,535.22
Infrastructure assets	37,343,839,638.04	38,219,214,637.34
Intangible non-current assets	8,809,657.54	8,951,226.02
Other non-current assets	231,678,611.79	218,744,304.79
Total non-current assets	**40,899,112,391.98**	**42,263,087,647.11**
Total assets	**41,118,841,779.49**	**42,437,962,876.87**

DWR Financial Report
Financial status report
As of September 30, 2018

(Unit : Baht)

	2018	2017
Liabilities		
Current liabilities		
Short-term creditors	51,196,435.04	58,615,783.13
Short-term deposits	100,145,411.30	99,508,868.25
Other current liabilities	8,400.00	8,400.00
Total current liabilities	**151,350,246.34**	**158,133,051.38**
Non-current liabilities		
Creditors by transfer and long- term sales	17,637,925.83	16,735,992.40
Long-term government advances from Treasury	3,100,000.00	3,100,000.00
Other non-current liabilities	4,543.74	12,943.74
Total non-current liabilities	20,742,469.57	19,848,936.14
Total liabilities	**172,092,715.91**	**177,981,987.52**
Net assets	**40,946,749,063.58**	**42,259,980,889.35**
Net assets		
Capital	451,953,929.02	451,953,929.02
Revenues above (below) cumulative expenditure	40,494,795,134.56	41,808,026,960.33
Total net assets	**40,946,749,063.58**	**42,259,980,889.35**

DWR Financial Report
Income and expenditures statement
As of September 30, 2018

(Unit : Baht)

	2018	2017
Revenue		
Revenue from government budget	5,170,061,169.26	5,263,315,416.83
Revenue from government support funds	172,317,748.08	624,960,143.70
Revenue from sales and services	167,738.00	-
Revenue from other support funds & donations	30,070,367.86	2,006,657.41
Other revenue	723,210.00	12,870.00
Total Revenue	**5,373,340,233.20**	**5,890,295,087.94**
Expenses		
Salaries and wages	845,630,081.91	857,948,789.82
Pension funds	287,710,602.74	270,506,992.03
Compensation	15,752,156.00	13,827,652.00
Material & supply expenses	392,387,417.99	643,097,999.61
Material & supply expenses	37,173,025.96	38,056,232.90
Utility expenses	33,931,944.56	32,574,835.33
Depreciation and amortization	5,006,269,651.52	4,079,337,735.13
Expenses from other support funds & donations	244,154,073.07	37,976,897.40
Other expenses	(8,588,911.28)	156,749,702.40
Total expenses	**6,854,420,042.47**	**6,130,076,836.62**
Income below operating expenses before cost of funds	-1,481,079,809.27	-239,781,748.68
Cost of funds	-	-
Net income below operating expenses	**-1,481,079,809.27**	**-239,781,748.68**

Part 4

Other Significant Performance/Activities

Department of Water Resources supported Royal Initiative Projects

28 November 2017

Mr. Somnuk Sookchaoy, Deputy Director-General of the Department of Water Resources, accompanying with DWR officials, welcomed Her Royal Highness Princess Maha Chakri Sirindhorn on the occasion of proceeding to preside over the Academic Conference and Exhibition of Thai Resources: Potential in the year 2017 and observed the progress of the Plant Genetic Conservation Project at Centre of Learning for the Region (CLNR), Chulalongkorn University, Saraburi Campus which the Department of Water Resources supported the operation of Royal Initiative Projects since 2013.

16 January 2018

Mr. Bhadol Thavornkitcharat, Deputy Director-General of the Department of Water Resources, accompanying with Mr. Anan Petchnoo, Director of the Coordination and Management of Nan River Basin Division, Mr. Yothin Pongsiri, Director of the Water Resources Development and Rehabilitation Division and officers from Water Resources Regional Office 9, welcomed Her Royal Highness Princess Maha Chakri Sirindhorn on the occasion of proceeding to perform royal duties at Phufa Development Center, Phufa Sub-district, Bo Kluea District, Nan Province.

24 January 2018

Mr. Somnuk Sookchaoy, Deputy Director-General of the Department of Water Resources, together with Mr. Snay Sathutham, Director of Water Resources Regional Office 1 and officers from Water Resources Regional Office 1 welcomed Her Royal Highness Princess Maha Chakri Sirindhorn on the occasion of proceeding to monitor the operation of the Omkoi Development Learning Center, Omkoi Sub-district/ District, Chiang Mai Province. In this regards, Mr. Somnuk Sookchaoy, Deputy Director-General, presented the Project of Water Distribution System supporting the Omkoi Development Learning Center as Royal Initiated which had been constructed from 2009 to 2015. Department of Water Resources has coordinated with the Center and acknowledges that the amount of water is not sufficient during the dry season. Primarily, DWR has spent the remaining budget of the fiscal year 2018 for constructing three reinforced concrete water tanks with the storage capacity 250 cm^3 to reserve water for the dry season. In the long term, DWR has planned to build the reservoir in the area above the Huai Bon Reservoir which the storage capacity of 100,000 cm^3, and locate water pipelines connecting to the main water distribution system ensuring the sufficient available water for the Omkoi Development Learning Center.

12 February 2018

Mr. Chamnan Fagkong, Director of Water Resources Development and Rehabilitation Division, Water Resources Regional Office 1, and Ms. Wananong Uchukosolkarn, Director of KokRiver and Northern Mekong River Basin Management and Coordination Division, along with DWR staffs welcomed Her Royal Highness Princess Maha Chakri Sirindhorn on the occasion of proceeding to follow-up the progress of the Following the King's Footsteps Project with the Management Cockpit Approach, and observe important exhibition and project activities. Mr. Chamnan Fagkong presented the water distribution system project as a provision for increasing water sources following the royal initiative. Its function is to divert water from Kok River to support the Following the King's Footsteps Project by the Management Cockpit Approach.

7 June 2018

Mr. Somnuk Sookchaoy, Deputy Director-General of the Department of Water Resources accompanying with DWR staffs, welcomed Her Royal Highness Princess Maha Chakri Sirindhorn at Ekathotsarot Camp, Phitsanulok Province on the occasion of proceeding to establish the Agricultural Product Packing Center officially, Army Region 3, a place for packing agricultural and organic products harvested from the Following the King's Footsteps Project before selling, and also observe activities in the camp. In this regard, Mr. Somnuk Sookchaoy, Deputy Director-General of the Department of Water Resources, reported the installation of a solar-powered water distribution system to support the Center. This system distributes water from its source to agricultural plots of the project covering an area of 53 rai approximately. It pumps water from its sources to store in the high-tall tank before releasing through main pipes to the appropriated distribution point in each zone. It can pump and distribute the water around 100 cm^3 for agricultural areas per day.

Meeting, Seminar, Technical Visit on Water Resources Management

Thailand hosted the Twenty-fourth Meeting of the MRC Council

Mr. Worasart Apaipong, Director General of Department of Water Resources, as a Joint Committee of Mekong River Commission, attended the Twenty-fourth Meeting of the MRC Council during 28-30 November 2017 at InterContinental Pattaya Resort, Chonburi Province. Ministries from MRC member states including Cambodia, Lao PDR, and Vietnam, as well as representatives of dialogue partners and development partners attended the Meeting. It has objectives to discuss and define the sustainable development policy in the Mekong Basin, administration, and cooperation framework with dialogue partners, development partners, and related international organizations.

The 3rd Asia-Pacific Water Summit

The 3rd Asia-Pacific Water Summit was held during 11-12 December 2017 at Yangoon City, Myanmar under the theme of "Water Security for Sustainable Development." The participants included Presidents, Ministers, Director General, scholars, and interested parties from 49 countries. Executives and experts from DWR also attended the Summit. General Surasak Kanchanarat, Minister of Natural Resources and Environment, gave the keynote address at the opening ceremony. He expressed the intention to perform various actions for achieving Sustainable Development Goals (SDGs), and cooperate with all countries to deliver water security for people's well-being in the Asia-Pacific. The Summit focused on innovation and practices development for water security in the Asia-Pacific, such as water cycle management, good governance for solving common problems ensuring that "Leave No One Behind."

Spatial Analysis on Water Crisis (Area Based)

The Royal's Thai Government has a policy for solving flood and drought problems effectively and accountability by focusing on the application of the King's Wisdom and Area-based Approach. Department of Water Resources has conducted Spatial Analysis on Water Crisis (Area Based). It classifies the analyzed areas into six regions. Analysis results of 2 regions have been already reported to the Cabinet. Secretariats of River Basin Committee have to apply these water crisis maps to develop water crisis management plan in their basins. The project support capacity buildings for officials of the Department of Water Resources, especially who works in River Basin Coordination and Management Divisions, to have knowledge and understanding about the development of Spatial Water Crisis Map (Area Based), which can be effectively applied for conducting water resources management plan in accordance with the government policy. So, the Water Crisis Prevention Center organized the Workshop on Application of Geo-informatics for Water Crisis Area Analysis on 15-19 January 2018 at Mekhala Center, Water Crisis Prevention Center. Mr. Bhadol Thavornkitcharat, Deputy Director-General of the Department of Water Resources presided over the workshop and present certificates to the trainees.

The Project of Analysis for Water Resources Management in the year 2018

The Department of Water Resources has conducted an analysis of water resources management in the year 2018. It consists of 2 programs, namely, 1) Analysis and Prioritization of Rainfed Agricultural Area, 2) Water Balance Analysis at the District Level in the Rainfed Agricultural Area.

1) Analysis and Prioritization of Rainfed Agricultural Area Thailand's Water resources management architecture has been changed in the last couple of years because of the emerging of the Offices of the National Water Resources and the National Water Resources Act B.E. 2561 that change the mandates of the Department of Water Resources from its origin enacted since 2003. Currently, the Department of Water Resources has been designated as an operation unit. The operation area is the rainfed agricultural area, covering the area of 119.02 million rai. Classification and prioritization of the rainfed agricultural area are important and urgent enabling the Department of Water Resources to define development projects in the priority area. It is also the reason to request for financial support from related agencies, which are the Office of the National Water Resources and the Bureau of the Budget respectively.

Criteria for classifying and prioritizing the rainfed agricultural area are based on the latest set of data of land-use, geographical characteristic (irrigated area, forest area, surface water area, community area, etc.), household income, number of households, household's locations, etc. From the above data, the study does not use only physical data, but also socio-economic data. Rainfed agricultural areas can be classified into seven types based on the risk level, household income, poverty line, and revenue structure (agriculture sector or other sectors) shown as below;

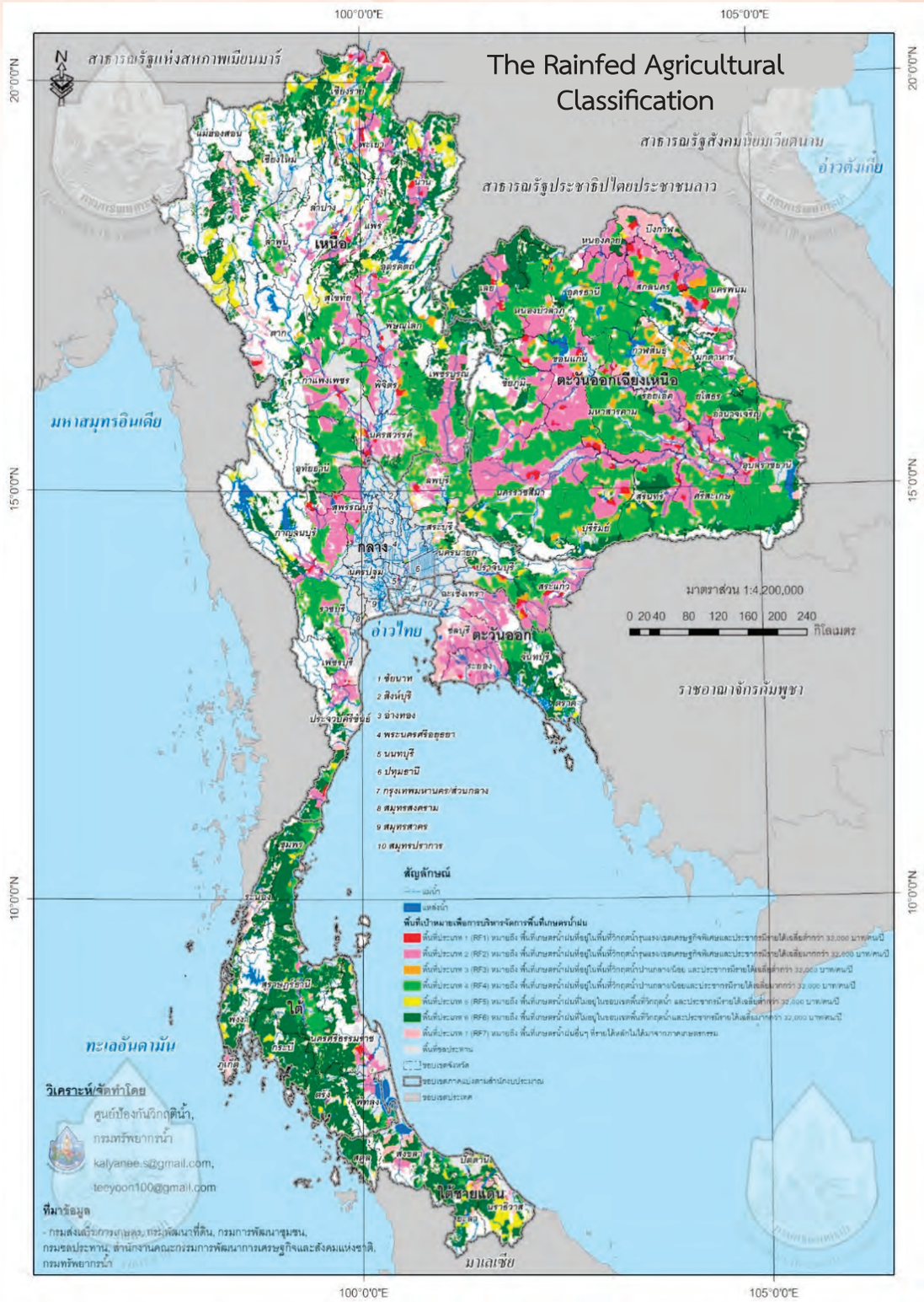
1. Type 1 (RF1) is a critical area or special economic zones, and the average personal income is less than 32,000 Baht/household/year.

2. Type 2 (RF2) is a critical area or special economic zones, and the average personal income is higher than 32,000 Baht/household/year.

3. Type 3 (RF3) is a moderate and low-risk area, and the average personal income is less than 32,000 Baht/household/year.

4. Type 4 (RF4) s a moderate and low-risk area, and the average personal income is higher than 32,000 Baht/household/year.

5. Type 5 (RF5) is a normal area, and the average personal income is less than 32,000 Baht/household/year.



The result of this analysis is accepted by relevant agencies, namely the Office of the National Water Resources, and an academic institution (technical paper), in term of management (public sector) and technical issue (academic conference).

2) Water Balance Analysis at the District level in the Rainfed Agricultural Area. Department of Water Resources has conducted the project of Water Balance Analysis at the District Level in the Rainfed Agricultural Area continually from 2017-2019. Set of data could be applied for water resources management in the dry season with Water Balance Analysis in the irrigated Area of Royal Irrigation Department and the Cultivation Plan in the Dry Season of the Department of Agricultural Extension respectively.

The analytical method uses meteorological and hydrological data, crop area, population, numbers/type of industry, water demand for maintaining the downstream ecosystem. The analysis process is as follows;

1) Analysis of water supply (rainfall, runoff, water volume in small water bodies of the Department of Water Resources and Department of Disaster Prevention and Mitigation)

2) Analysis of water demand (water demand for domestic use, downstream ecosystem protection, agriculture, and industry)

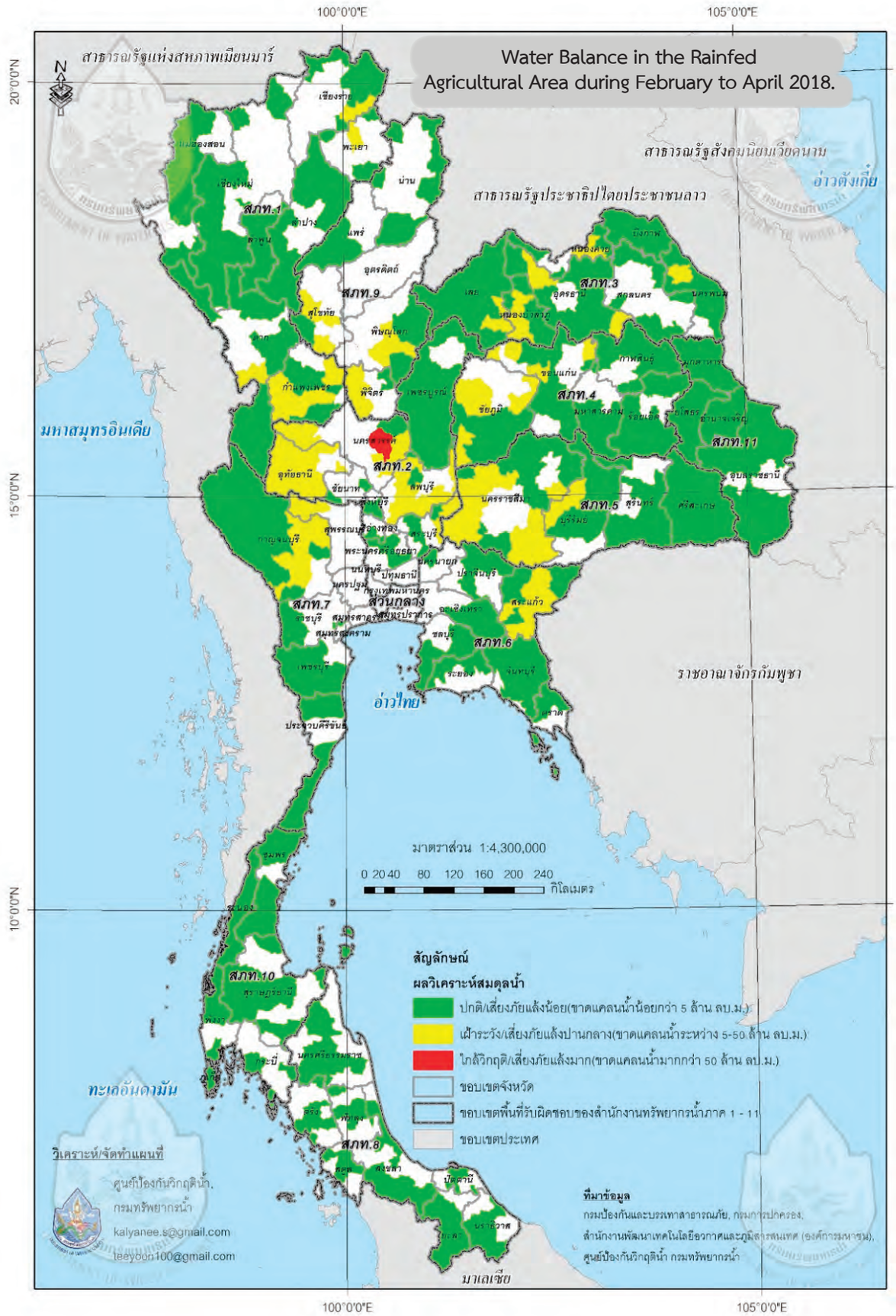
3) Analysis of water balance at the district level calculated from the difference between water demand and supply in each district

The example of Water Balance Analysis in the rainfed agricultural area from February to April in the year 2018;

Scarcity Level	Shortage Volume (Million cm^3)	Numbers (Province)	Numbers (Province)
Crisis/Very Risk to Drought	volume > 50	1	1
Alert/Moderate Risk to Drought	5 ≤ volume < 50	23	73
Normal/Low Risk to Drought	volume < 5	-	-
Total		**23**	**74**

From the table above, 74 of 743 Districts (around 10 percent) in the rainfed agricultural area will face water shortage for three months (from February - April 2018).

This set of data is an important component for water resources management in the dry season of the National Water Resources Committee. Additionally, its result has been presented in the international conference, the 3rd MRC Summit held in the Kingdom of Cambodia. The project disseminates knowledge about water balance analysis at the District Level in the Rainfed Agricultural Area to officials of the Department of Water Resources from both central and regional offices through 2 training courses.



Department of Water Resources attended Thailand-ROK Cooperation Meeting

Mr.Worasart Apaipong, Director General of the Department of Water Resources, with DWR team, attended the meeting of Thailand-Republic of Korea (ROK) water resources cooperation during 30 January - 2 February 2018 at the Republic of Korea. The delegation met Mr. Park Jae-heyon, Vice Minister of Land, Infrastructure, and Transport and discussed the signing of Memorandum of Understanding (MoU) on Water Resources Cooperation between Ministry of Natural Resources and Environment of the Kingdom of Thailand and Ministry of Land, Infrastructure, and Transport of the Republic of Korea. The Thai Cabinet has the resolution on 4 October 2016 approving the draft of MoU and authorizes Minister of Natural Resources and Environment as a signatory. Presently, it was waiting for signing. In this meeting, both sides expressed their intention to sign the MoU at the earliest opportunity to achieve tangible cooperation and mutual benefits in water resources management. Thai side proposes to host the MoU signing ceremony in the year 2018 in Thailand, while ROK suggests hosting the ceremony in Kora International Water Week 2018.

Department of Water Resources attended the 1st Meeting of National Water Resources Committees of the year 2018

Mr.Somnuk Sookchaoy, Deputy Director-General of the Department of Water Resources and DWR executives, participated in the 1st Meeting of National Water Resources Committees of the year 2018 on 2 February 2018 at Phakdee Bodin Building, Government House. The meeting discussed the operation of the National Water Resources Committees, action plan, budget, development framework to support the Eastern Economic Corridor (EEC), and the preparation for the year 2018.

Department of Water Resources hosted the 2nd Meeting of Joint Working Group on Water Resources Management under Mekong-Lancang Cooperation Framework

Department of Water Resources hosted the 2nd Meeting of Joint Working Group on Water Resources Management under Mekong-Lancang Cooperation Framework on 1 March 2018 at Dusit Island Resort, Chiang Mai Province. Participants were representatives from six member countries consisting of the People's Republic of China, the Kingdom of Cambodia, Lao People's Democratic Republic, the Republic of the Union of Myanmar, the Republic of Vietnam, and the Kingdom of Thailand. Thai delegations included Mr.Worasart Apaipong, Director General of the Department of Water Resources, Mr. Somkiat Prajumwong, Secretary-General of the Office of the National Water Resources, Mr.Bhadol Thavornkitcharat, Deputy Director-General of the Department of Water Resources, Mr. Nikorndeth Palangkul, Deputy Director-General of the International Economic Affairs, Ministry of Foreign Affairs and representatives of working group from relevant agencies.

The meeting aimed to promote sustainable development in the Mekong Sub-region, reduce inequality, and support the development of ASEAN Community by promoting 3 areas of cooperation including

1) political and security issues, 2) economic and sustainable development, and 3) social, cultural and people-to-people exchanges. There are six priority areas of cooperation, namely water resources, connectivity, industries, cross-broader economic cooperation, agriculture, and poverty reduction. Mekong-Lancang Cooperation framework works in multiple platforms in leadership level, ministerial level, senior official level, and working group level.

Department of Water Resources attended the Ministerial Meeting in the 8th World Water Forum

Mr.Worasart Apaipong, Director General of the Department of Water Resources, along with the head of Thai delegation, Mr. Surasak Suparat, Ambassador of Thailand to Brasilia, attended the Ministerial Meeting in the 8th World Water Forum during 18-20 March 2018 at Brasilia. Director-General of the Department of Water Resources joined the Ministerial Roundtable Meeting in the topic of "People" and made a National Statement pointing out that Thailand has given importance to the Sustainable Development Goals (SDGs 2030) and sustainable water resources management by adopting the Sufficiency Economy Philosophy of His Majesty King Bhumibol Adulyadej to achieve the goal. Presently, the institutional and legal framework has been strengthened by formulating the 12-years National Strategic Plan on Water Resources Management and establishing the National Sustainable Development Committees and the Office of National Water Resources to manage integrated water resources. Ministerial Declaration on the topic of "Urgent Call for Decisive Action on the Water" which is the result document of the Ministerial Meeting of the 8th World Water Forum has been endorsed on 20 March 2019. After that, Thai delegation visited the exhibition of other countries such as the People's Republic of China, Republic of Korea, Japan, Kingdom of the Netherlands, Kingdom of Morocco, the Federal Republic of Brazil and World Water Council, etc. Moreover, they also attended technical sessions to observe academic presentations on water management under topics of climate change, people, development, urbanization, ecosystem, and finance from other countries.

Department of Water Resources attends the Preparatory Meeting for the 3rd Mekong River Commission Summit

Mr.Worasart Apaipong, Director General of the Department of Water Resources as Secretary of Thai National Mekong Committee, attended the Preparatory Meeting for the 3rd Mekong River Commission Summit on 28 March 2018 at Thai Khufa Building, Government House. He explained the preparation process for participating in the 3rd Mekong River Commission Summit, including general information of the Mekong Basin and regional development as well as technical works. Department of Water Resources has cooperated with relevant government agencies to conduct the Prime Minister's statement, talking point for various levels of meetings and the drafted Siem Reap Declaration (2018), the main output which will be endorsed by Ministers of member states in the Summit.

Department of Water Resources attended the 18th Meeting of ASEAN Working Group on Water Resources Management (AWGWRM)

Mr.Somnuk Sookchaoy, Deputy Director-General of the Department of Water Resources, accompanying with DWR officials, attended the 18th Meeting of ASEAN Working Group on Water Resources Management (AWGWRM) during 29-30 March 2018 at Naypyidaw, Republic of the Union of Myanmar. The objectives are to report and follow up on the implementation according to the previous meeting resolution and to consider plans for the next phase implementation. The meeting authorized Thailand to be a lead country for implementing the water conservation program in the ASEAN region under the ASEAN Strategic Plan on Environment (ASPEN) (2016-2025) and to be a host for organizing the Workshop on Risk and Impacts from Extreme Events of Drought in ASEAN Countries in the year 2019. It is an important ASEAN water-related activity on the occasion of Thailand's ASEAN Chairmanship in the year 2019.

Department of Water Resources participateed in the MRC International Conference

Mr. Supapap Patsinghasanee, Director of Water Operation Center (Mekhala Center) and Mr. Jeerapong Laonamsai, Civil Engineer, Practitioner Level attended the MRC International Conference held on 2-3 April 2018 at Siem Reap, Kingdom of Cambodia. Both conducted a presentation on academic works in the topic "Evaluation of MRC Flash Flood Guidance System for Southern Thailand: Case Study from 28 November to 4 December 2017" and "Evaluation of Water Balance Process in Dry Season for the Rainfed Areas in Thailand: Case Study from 2016 to 2018".

Department of Water Resources attended the MRC Ministerial Meeting before the 3rd MRC Summit

Mr. Worasart Apaipong, Director General of the Department of Water Resources and Thai delegation attended the MRC Ministerial Meeting which was held before the 3rd MRC Summit on 4 April 2018 at Sokha Siem Reap Resort & Convention Center in Siem Reap, Kingdom of Cambodia. Participants include delegates from other 3 MRC member states namely Kingdom of Cambodia, the Lao People's Democratic Republic and Republic of Vietnam, representatives from dialogue partners (the People's Republic of China and Republic of the Union of Myanmar) and development partners. H.E. Mr. Lim Kean Hor, Minister of water resources and meteorology of the Kingdom of Cambodia, was a chairman. The meeting acknowledged the implementation following the Ho Chi Minh Declaration (2nd MRC Summit) and considered the draft of Siem Reap Declaration, which will be endorsed in the 3rd MRC Summit. Also, the meeting noted the information and cooperation framework between MRC and dialogue partners/ development partners. Thailand gave priority to the implementation under cooperation framework for sustainable development in the Lower Mekong Basin (1996) which is consistent to the Sustainable Development Goals (SDGs) on water, food and energy security as well as the strengthening the MRC and the relationships with development partners by promoting to be a regional learning center in transboundary river management for flood and drought mitigation, and to improve people's well-being in the Mekong Basin for further sustainability.

Department of Water Resources signed the Thailand-Lao PDR Action Plan on Water Resources Cooperation

Mr.Worasart Apaipong, Director General of the Department of Water Resources and Mr. Inthavy Akkarath, Director General of the Department of Water Resources of the Lao People's Democratic Republic signed the Thai-Laos Action Plan on Water Resources Cooperation under the Memorandum of Understanding on Natural Resources and Environment Cooperation between Ministry of Natural Resources and Environment of Thailand and the Lao People's Democratic Republic on 4 May 2018 at Water Resources Regional Office 3, Udon Thani Province. The Action Plan has four main programs, namely basin development, development of demonstration center, water allocation, and research and development. Both sides had a joint study on guidelines for the utilization of Nam Pan Reservior, Sang Khom District, Udon Thani Province which Department of Water Resources has developed and conserved the reservoir to promote ecotourism and community economic center with public participation process (Pracharat model).

Department of Water Resources attended the 1st Thailand-China Meeting of Joint Committee on Water Resources Management

Mr.Worasart Apaipong, Director General of the Department of Water Resources, as a head of Thai delegate, along with Mr. Santiporn Nimkingrat, Deputy Director-General of the Department of Water Resources and delegations attended The 1st Thailand-China Meeting of Joint Committee on Water Resources Management which was held on 9-11 May 2018 at Beijing, the People's Republic of China. The meeting discussed the development of strategy, policy, an action plan on water resources, appropriate technologies for flood and drought mitigation, hydrological technologies, capacity building or knowledge exchanges on water resources management. Both sides agreed to share experiences and extend the field of cooperation on water resources management under Mekong-Lancang Cooperation framework, especially the 5-year LMC Action Plan on Water Resources Management as well as joint research on sustainable water resource management and conservation.

Department of Water Resources attended the 2nd Lao PDR - Thailand Joint Working Group on the Development of Electrical Energy Cooperation

Mr.Bhadol Thavornkitcharat, Deputy Director-General of the Department of Water Resources, the primary representative in the Thailand-Lao PDR Joint Committee on the Development of Electrical Energy Cooperation, along with related DWR staffs, attended the 2nd Lao PDR - Thailand Joint Working Group on the Development of Electrical Energy Cooperation (The 2nd LTJWG - EEC) during 18-19 May 2018 at Luang Phrabang, the Lao People's Democratic Republic to follow up the progress of electric power issues between Thailand and Lao PDR.

Department of Water Resources attended the 2nd Meeting of National Water Resources Committees in the year 2018

General Prayuth Chan-Ocha, Prime Minister, was a chairman in the 2nd Meeting of National Water Resources Committees in the year 2018 on 21 May 2018 at the Phakdi Bodin Building, Government House. Mr. Worasart Apaipong, Director General of the Department of Water Resources and DWR executives, attended the event.

The meeting discussed the important plans on water resources management, improvement of the planning process, implementation of the national water resources management strategy, solar-powered water distribution system projects, revision of the Regulations of the Office of the Prime Minister on Water Resources Management 2007 (B.E. 2550) and international cooperation on water resources management policy. The meeting also talked about the water resources management plan in the rainy season of the year 2018. It is predicted that the precipitation rate is less than average around 5-10 percent and also less than the year 2017. The dry spell may happen in June. Also, the storm may enter the country during August-September. For flood preparedness, the meeting commanded Thai Meteorological Department, Royal Irrigation Department, Department of Water Resources and all relevant agencies to be ready for flood situations by preparing machinery and equipment as well as monitoring the situation continuously.

Department of Water Resources organized the Workshop on the Promotion and Monitoring of Water Saving in Government Agencies

Department of Water Resources organized the Workshop on the Promotion and Monitoring for Water Saving in Government Agencies of the year 2018 on 31 May 2018 at the Emerald Hotel, Bangkok. Mr.Bhadol Thavornkitcharat, Deputy Director-General of the Department of Water Resources presided over the opening ceremony. The participants included representatives from government agencies in Bangkok and the metropolitan area approximately 200 persons. The Workshop aimed to promote water saving in government agencies, to raise awareness on participation in water saving for officers in government agencies, especially who participate in Water Saving Indicator Project in the fiscal year 2015 to continuously promote and follow-up water saving in government agencies.

Department of Water Resources visited Rhone River Basin, France

Mr. Santiporn Nimkingrat, Deputy Director-General of the Department of Water Resources and Ms. Nuanlaor Wongpinitwarodom, Director of Bureau of International Basin Management, visited Rhone River Basin in France during 4-7 June 2018. The visit aimed to exchange experiences on water resources management and related resources, hydropower dams, flood prevention, navigation, irrigation, cascade dam management, solar power, and wind power management.

Department of Water Resources attended the 23rd Session of the International Hydrological Programme - Intergovernmental Council

Mr.Somnuk Sookchaoy, Deputy Director-General of the Department of Water Resources, accompanying with DWR officials participated in the 23rd Session of the International Hydrological Programme - Intergovernmental Council during 11-15 June 2018 at UNESCO Head Office in Paris, France. The objective is to report and review the overview of the hydrological implementation of member states under the eighth phase of IHP (IHP-VIII) (2014-2021), discuss the strategic preparation (roadmap) for IHP's Ninth Phase (2022-2029) as well as follow up the implementation of the Sustainable Development Goals in target 6. The 1st Water Science-Policy Interface Colloquium (SPIC Water) was held on 14 June 2018. Ministerial or vice-ministerial representatives from member states conveyed the report on the implementation for achieving the SDGs target 6 as well as joint agreements from various important water platforms such as World Water Forum.

Department of Water Resources participated in the 4th International Conference on Water Resources and Wetlands

Mr.Somnuk Sookchaoy, Deputy Director-General of the Department of Water Resources and DWR team, attended the 4th International Conference on Water Resources and Wetlands held on 6-8 September 2018 at the Republic of Romania. The meeting has objectives to exchange experiences and expertise on water and wetland management as well as to build an expert network under Mekong-Danube-Rhine cooperation framework. The Conference was organized by Romanian Limnogeographical Association (RLA), German Limnological Society (GLS), Polish Limnological Society (PLS), Danube Delta National Institute Tulcea (DDNI), Danube Delta Biosphere Reserve Authority (DDBRA), organizations in Danube Basin, research institutions, and associations related to water management in Europe.

Representatives from the Department of Water Resources presented the Initiatives on

Ecosystem-based Approaches (EbA) to Climate Change Adaptation, which is a prototype project implemented in Young Basin (Kalasin Province and Roi Et Province). It succeeds in network building and public participation for climate change adaptation and local development by adopting the King's Wisdom. This approach can capture the audience's attention. On this occasion, Deputy Director-General of the Department of Water Resources conveyed a statement expressing his appreciation and his support the works for building personal capacity, technical cooperation and knowledge exchange between the Mekong Basin and Danube Basin.

Department of Water Resources conducted Technical Visit and Site Survey on the Lower Mekong River under Joint Research Proposal between Lancang River (Upper Mekong) and Lower Mekong River

Department of Water Resources conducted Technical Visit and Site Survey on the Lower Mekong River under Joint Research Proposal between Lancang River (Upper Mekong) and Lower Mekong River, funded by Mekong River Commission, during 13-14 December 2017 at the area in Nakhon Phanom-Sakon Nakhon Province. Participants include Mr. Mongkol Lukmuang, Director of the Bureau of Research, Development and Hydrology and representatives from Water Crisis Prevention Center, Water Resources Regional Office 3, Mekong River Commission, China, and International Water Management Institute: IWMI, totally 22 persons. They visited CCTV station in Paknam Chiyaburi (Chaiyaburi river mount) and telemetry station in Ban Haad Phaeng, Nakhon Phanom Province. They studied water management in Songkram Basin-Klum Basin and the environmental condition in the Mekong right riverbank in Nakhon Phanom Province.

Department of Water Resources attended the 23rd National Convention on Civil Engineer

Mr. Supapap Patsinghasanee, Director of Water Operation Center (Mekhala Center) and Mr. Jeerapong Laonamsai, Civil Engineer, Practitioner Level attended the 23rd National Convention on Civil Engineering under the theme "SMART Civil Engineering and Social Enterprise" on 18-20 July 2018. They presented the academic work namely "Evaluation of MRC Flash Flood Guidance System for Southern Thailand: Case Study from 28 November to 4 December 2017" and "Flood Assessment in Lower Yom and Nan River Basins by Using Hydrological and Hydrodynamic Models."

Department of Water Resources welcomed the delegation from Sri Lanka

On 8 January 2019, Mr. Supapap Patsinghasanee, the Director of Mekhala Center and DWR officers warmly welcomed the officers from Burapha University on the occasion of bringing the delegation from Water Resources Development Project of Sri Lanka to visit DWR and listen to briefing topic of the Water Resources in Thailand, Early Warning for flood and landslide, Flood model and River Basin Management.

Department of Water Resources welcomed the delegation from Bhutan

On 10 January 2019, Mr.Bhadol Thavornkitcharat, Deputy Director-General, and DWR officers warmly welcomed the officers from Asian Disaster Preparedness Center on the occasion of bringing the delegation from Bhutan to visit DWR and listen to briefing topic of Disaster Risk Management and Water Resources Management in Thailand, Early Warning for flood and landslide, Flood model and River Basin Management.

Department of Water Resources welcomed the delegation from Japan

On 16 January 2019, Mr.Worasart Apaipong, Director General of DWR warmly welcomed Mr. Yukinobu NAGAMINE, the Director of Radio Communications Division, Bureau of Telecommunications, Ministry of Internal Affairs and Communications, Japan at Director General's meeting room to consult and exchange information regarding the benefit of forecasting radar and climate information for water resources management.

Department of Water Resources welcomed the delegation from Germany

On 19 February 2019, Mr.Worasart Apaipong, Director General of DWR warmly welcomed Mr.Tim Mahlerm, the Director of German International Cooperation (GIZ) Thailand and Mr.Stephan Huppertz, Director of Thailand-German Climate Programme to propose the cooperation project between the government of Thailand and Germany which supported Thailand to active the goal of climate adaptation by using ecosystem-based approach. In addition, GIZ would also jointly support the water resources projects during 2018-2021 by receiving cooperation from the Royal Irrigation Department and Department of Public Works and Town and Country Planning for working together.

Department of Water Resources welcomed the delegation from Ministry of Defence

On 23 February 2019, Mr. Supapap Patsinghasanee, the Director of Mekhala Center and DWR officers warmly welcomed the delegation from Office of Policy Planning, Ministry of Defence to visit the Water Crisis Prevention Center and continued briefing on the topic of Climate Change and Water Resources. The objectives of this visit were strengthening the cooperation between civilian and military on disaster prevention and mitigation as well as exchanged knowledge and experiences on disaster risk management and coordination including created understanding about role and responsibility of each section in disaster management according to Disaster Prevention and Mitigation Plan B.E. 2558 (2015).

Department of Water Resources welcomed the delegation from P.R. China

On 3 March 2018, Mr.Manop Thailor, Chief of Hydrological Center no. 12 (Chiangsan), Hydrological Division, Water Resources Regional Office 1 along with Mr.Winai Wangphimoon, Engineer, Senior Professional Level, Bureau of International River Basin management warmly welcomed the Joint Steering Committee from PR China led by Dr.Yu Xingjun,Director General of Department of International Cooperation, Science and Technology, Ministry of Water Resources and delegation to visit Mekong-HYCOS in Chiangsan Sub-district, Chiangrai Province and discussed on the hydrological implementation at the meeting room of Hydrological Center no. 12 (Chiangsan).

Department of Water Resources welcomed students from the engineering department, Chulalongkorn University

On 27 March 2018, Mr.Mongkol Lukmuang, Director of Water Crisis Prevention Center warmly welcomed students from faculty of engineering, Chulalongkorn University to visit DWR and listen to briefing topic of water monitoring system and early warning system which the speakers were Mr.Khunphot Buatone, Director of Plan and Measures Division and Mr.Karun Premvuti, Director of Research, Development and Hydrology Division.

Department of Water Resources welcomed the delegation from Singapore

On 28 March 2018, Mr.Worasart Apaipong, Director General of DWR warmly welcomed Dr.Pang Chee Meng, Director of Bureau of Supporting Industries Development and Mr. Han Loong Fong, Assist. to Senior Director, Bureau of Supporting Industries Development of The Public Utilities Board (PUB), Singapore to discuss about Thailand-Singapore Civil Service Exchange Programme: CSEP which PUB would be the host for the meeting under the theme, CSEP 2018 Programme on Water Use Efficiency and Urban Water Management in Singapore

Department of Water Resources welcomed the Vice Minister of Water Resources, P.R. China

On 26 April 2018, Mr.Worasart Apaipong, Director General and DWR executives warmly welcomed and attended consultative meeting with H.E. Mr. Lu Guihua, Vice Minister of Water Resources, PR China at Hydrological Center no. 12 (Chiangsan), Chiangrai Province to study the water resources project in Mekong River and exchanged information about water resource management in the Upper Mekong area.

Department of Water Resources welcomed the delegation from Mekong River Commission Secretariat (MRCS)

On 26 April 2019, Mr.Bhadol Thavornkitcharat, Deputy Director-General of DWR warmly welcomed the delegation from Mekong River Commission Secretariat (MRCS) by Mr.Supapap Patsinghasanee, the Director of Mekhala Center was the speaker on the topic of water resources management of Thailand and forecasting and warning system of flood and drought.

The Department of Water Resources welcomed the delegation from Indonesia

On 3 May 2018, Mr.Somnuk Sookchaoy, Deputy Director-General of DWR warmly welcomed delegation from National Institute of Public Administration: NIPA, Indonesia led by Dr. Tri Widodo Wahyu Utomo, Vice Chairman of NIPA and the participants from Reform Leader Academy Training who were the high level officers from the agencies in Indonesia to have a study visit about Watershed Management in Thailand.

Department of Water Resources welcomed the delegation from the Royal Irrigation

On 12 Jung 2018, Mr.Nirut Koonphol, Director of Bureau of International Cooperation warmly welcomed the officers from Faculty of Political Science and Law Burapha University that led the delegation from Royal Irrigation Department, Nepal to study and exchange experiences on water resources management in national and local levels to bring best practices of Thailand to apply to their country with the name of speakers were Mr. Siriwat Jittanoon (Director of Operation Coordination Division), Kalayanee Suwanaprasert (Plan and Policy Analyst, Professional Level), Mr.Thepparat Wiriyothin (Plan and Policy Analyst, Professional Level) and Mr.Jeerapong Laonamsai (Civil Engineer, Practitioner Level).

Department of Water Resources attended The 23rd National Convention on Civil Engineering

On 18-20 July 2018, Mr.Supapap Patsinghasanee, the Director of Mekhala Center and Mr. Jeerapong Laonamsai, Civil Engineer, Practitioner Level attended The 23rd National Convention on Civil Engineering under the theme of SMART Civil Engineering and Social Enterprise with the presentation topic of "Evaluation of MRC Flash Flood Guidance System for the Southern Thailand : Case Study from 28th November to 4th December 2017" and "Flood Assessment in Lower Yom and Nan River Basins by Using Hydrological and Hydrodynamic Models"

Outstanding Activities in the Fiscal Year 2018

Volunteer Project "We Do Good Deeds with Our Hearts"

The Volunteer Project "We Do Good Deeds with Our Hearts" initiated by His Majesty the King which he is concerned about the well-being of the people and wished to make the nation stable and make people's lives better in accordance with His Majesty's principles to continue and maintain the Royal Initiative Projects to alleviate suffering and nourishing the people to develop the country to progress

On 16 July 2018, General Prayuth Chan-ocha, the Prime Minister presided over the Signing Ceremony of Memorandum of Agreement of the Volunteer Project for Watercourse Development and Sufficient Ways of Living which DWR jointly signed the MOA with Office of the Permanent Secretary, Office of the National Water Resources, Office of the Vocational Education Commission, National Research Council of Thailand, Armed Forces Development Command, Treasury Department, Royal Irrigation Department, Harbour Department, Royal Forest Department, Department of Provincial Administration, The Community Development Department, Department of Lands, Department of Public Works and Town & Country Planning, Department of Local Administration, National Science and Technology Development Agency, The Federation of Thai Industries, The Thai Chamber of Commerce, Provincial Administration Organization Association of Thailand, National Municipal League Of Thailand and Subdistrict Administration Organization Association of Thailand.

Types of Royal Volunteer Projects

The Royal Volunteer Projects are divided into 3 types; Volunteer for development, Volunteer for disaster and Special volunteers, the details of operational activities are as follows;

1) Volunteer for development aims to develop people's quality of life in local communities, whether it's an activity of community service, conservation of natural resources and environment, convenience and safety for life and occupation and public health

2) Volunteer for disaster aims to monitor and tackle the disasters caused by both natural and other issues which impact the lives of people in the area including to provide assistance to alleviate people's hardship from the disasters such as flood, fire and storm.

3) Special volunteer aims to support the operation in royal ceremony or welcome the royal personages in any occasion and also become the forces to work with the relevant government agencies to assist or facilitate the public during the event Period including the preparation and rehabilitation of the event location after the ceremony has done.

In the year 2017, the Department of Water Resource, Central office and Water Resources Regional office 1-11 organized the volunteer activity "We Do Good by Heart" consistontly. Therefore, the activities can be summarized as follows;

1. The activity of the volunteer for development such as the natural and environmental conservation activity to support “National Water Conservation Day” by collecting solid waste, removing water hyacinth, weeds and other waste, for 23 times, the activity for cleaning the office building, temple, market and public areas for 9 times, the activity for improving landscape, planting tree and vetiver, constructing and maintaining the weirs as well as releasing the fish more than 9 times, including the activity for encouraging the reduction of the use of plastic bag and foam box has been held for 2 times.

2. The activity of special volunteer such as volunteer activity to pay homage to the late King Bhumibol Adulyadej in remembrance of His Majesty the Late King Bhumibol Adulyadej and His Majesty King Chulalongkorn (Rama V), have been held for 3 times.

On 25 October 2017, Mr.Somnuk Sookchaoy, Deputy Director-General of DWR along with DWR officers joined the volunteer activity to express loyalty to His Majesty the King and pay homage in remembrances of late King Bhumibol Adulyadej which the activities were cleaning and improving the landscape of the Ministry of Natural Resources and Environment and nearby areas including cleaning the walkway along the Aree Alley in Bangkok.

On 22 December 2017, the Department of Water Resources led by Mr.Worasart Apaipong, Director General of DWR, Mr.Bhadol Thavornkitcharat and Mr.Somnuk Sookchaoy, Deputy Director-General Department Inspector, Director and officers from DWR joined the volunteer project to clean interior and exterior areas of Wat Kaew Fa Chulamanee, Dusit, Bangkok and the nearby areas.

On 21 March 2018, DWR joined the volunteer activity to strengthen community with people's happiness which was a part of activity from the volunteer project "We Do Good by Heart" in Chiang Mai Province. Moreover, the activity was to develop Klong Mae Kha Canal and tributaries covering the areas which Klong Mae Kha canal flowed through, consisted of Meuang District, Mae Rim District, and Hang Dong District. The implementation of the 1st phase started from Suk Ka Sem Road, Alley 7 at the watergate behinds Lanna Hospital area to the watergate of Ping River, the implementation was totally 2,040 meters in length. Moreover, His Majesty Principal Private Secretary also joined this activity as the chairman along with Mr.Pawin Chamnisart, the Governor of Chiang Mai, Chief of Government agency as well as Dr.Wasan Chompaksee, Ping River Basin Committee also participated in this event. In this regard, the Director of Upper Ping River Basin Coordination and Management also invited the officers from the Upper Ping River Basin Coordination and Management Division to participate in this volunteer activity as well.

On 24 May 2018, Mr.Pisith Thiposoth, Director of Water Resources Development and Rehabilitation, Acting Director of Water Resources Regional Office 3 led the delegation of Water Resources Regional Office 3 to joined the tree plantation "Project of Planting the forest" due to the National Forest Day in 2018 at Phu Foilom Ecotourism Project, Tab Kung Sub-district, Nong Saeng District by Dr.Wijarn Simachayam, Permanent Secretary of Ministry of Natural Resources and Environment was the chairman.

On 13 June 2018, Mr.Pisith Thiposoth, Director of Water Resources Development and Rehabilitation, Acting Director of Water Resources Regional Office 3 assigned Mr.Kasith Phumunnathanadet, General Administration Officer, Professional Level led volunteer delegation of Water Resources Regional Office 3 to join the Construction Project of Pra Charat Weir in Udon Thani Province at Wat Pa Phu Kam Niu, Ban Saeng Ararm, Kud Mak Fai Subdistrict, Nong Wua Sor District in Udonthani Province by Mr.Wattana Putchart, the Governor of Udon Thani Province was the chairman in this event.

On 21 July 2018, General Surasak Karnjanarat, Minister of Natural Resources and Environment led the executives and officers from the agencies under the Minister of Natural Resources and Environment to join the parade to encourage the campaign "We Do Good by Heart" to emphasizing the reduction of the use of plastic bags by distributing the cloth bags to the vendors on the street as well as people who walked around the market area to emphasize the reduction of plastic bag and foam box use. Moreover, this activity also promoted the participation between the government agencies and people. In this regard, Mr.Athiwat Sukontpradit, the Director of Bureau of Mass Promotion and Participation , Ms.Pochanan Supakkulthorn, Director of Water Resources Information Center and Ms.Nuttakarn Saetang, Acting Director of Internal Audit Cluster along with DWR officers also joined the similar event at Pak Kret Market, Pak Kret Municipality and Wat Daeng Thammachart, Sai Ma Sub-district, Meuang District in Nonthaburi Province.

On 30 August 2018, the Cooperation and Management of Mun River Basin Division organized the event of River Conservation and Development by People's Participation at Ban Son Public Canal, Moo 13, Nok Meuang District, Surin Province by Mr.Kritsanu Leuangphibunchit, Chief district officer of Meuang Surin was the chairman along with the government sectors, water users, community leaders, Local Administrative Organization, teachers, students and a lot of people in the area attended this event. Moreover, this event also held the discussion under the topic of River Conservation and Development by the Participation of People in Meuang Surin District as well as the exhibition, landscape improvement, weed removal and the activity to release the fish.

On 20 September 2018, the Department of Water Resources collaborated with Royal Police Cadet Academy in Nakorn Phatom Province organized the volunteer activity under the theme of "We Do Good by Heart" to develop the environment and adjusted the landscape around the canal area of Royal Police Cadet Academy as well as jointly planted the trees, sowed the fertilizer and released fish by Mr.Bhadol Thavornkitcharat, Deputy Director-General of DWR along with DWR executives, agencies from government sector, private sector and a lot of people participated in this event at Royal Police Cadet Academy, Sam Pran Sub-district, Sam Pran District, Nakorn Pathom Province

5 October 2017

Mr. Worasart Apaipong, Director General of DWR gave an interview on the TV Program "Clear-Kud-Chad-Jan" of NBT channel regarding the draft of the Water Resources Act and stated that "The law will manage and allocate the water use fairly by focusing on the participation of people". Moreover, the Director-General also gave an interview on the TV Program "Sud Sab Da" of the Blue Sky channel in several issues regarding the draft of the Water Resources Act B.E. ...

6 October 2017

Mr.Bhadol Thavornkitcharat and Mr.Somnuk Sookchaoy, Deputy Director-General of DWR joined the ordination ceremony under Pluk Ton Kla Yatra Putpoom Project to make a merit to mark the passing of His Majesty the Late King Bhumibol Adulyadej and honor His Majesty King Maha Vajiralongkorn Bodindradebayavarangkun at Lan Pho, Wat Saket Rajavaravihara Temple, Bangkok

12 October 2017

Mr. Worasart Apaipong, Director General of DWR joined the merit-making ceremony to pay homage to the late King Bhumibol Adulyadej on the occasion of the 1-year anniversary of His Majesty the Late King Bhumibol Adulyadej's death with praying and merit-making at the front building of Ministry of Natural Resources and Environment.

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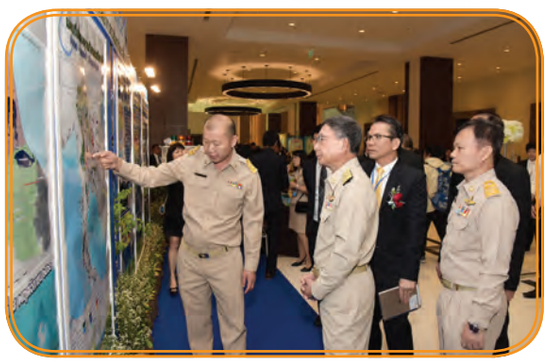
Mr. Worasart Apaipong, Director General of DWR presided over the Offering Ceremony of the Royal Kathina Robes in 2017 at Wat Phra Borommathat Worawihan, Chainat Sub-district, Meuang Chinat District, Chinat Province by the Vice Governor of Chinat, DWR executives and officers from central and regional offices also joined this ceremony.

26 October 2017

The Department of Water Resources, Ministry of Natural Resources and Environment paid a tribute and farewell in the Royal Cremation Ceremony of His Majesty the Late King as well as participated in the volunteer project to provide services for people who attended the Royal Cremation Ceremony at Wat PhaiTan Temple, Bangkok.

13 November 2017



Mr.Bhadol Thavornkitcharat, Deputy Director-General of DWR and Mr.Satit Sueprasertsuk, Director of Water Crisis Prevention Center together with DWR officers jointly organized the exhibition to enhance knowledge for the participants in meeting of Area-based Infrastructure Data Storage System for Sustainable Water Resources Management of 25 river basins of Thailand (Phase 1) at Centara Grand & Bangkok Convention Centre at Central World, Bangkok. This exhibition had objectives to support the government agencies who stored the data and stakeholders involving in water resources management of the country to know the background, importance, operational process, indicator development and guidelines to apply efficiently to the water management plan in different areas. And the project would take around 30 months for the implementation (29 March 2017-15 September 2019) which requiring the study of Water Management Index, (WMI) that used to measure management level in each area and formulated the approaches for decision making regarding water resources issues in the future. It consisted of 8 dimensions; 1) Water resources budget 2) Water management for consumption 3) Water security for development 4) Balance of water budget and water use 5) Water quality and environmental management 6) Disaster management caused by water 7) Management and conservation of upstream forest 8) Water Resources Management.

23 November 2017

The Department of Water Resource held the meeting of Operational Results Summary on the Project of Improved Management of Extreme Events through Ecosystem-based Adaption in Watersheds, this project was the collaboration between DWR and German International Cooperation (GIZ) which Mr.Somnuk Sookchaoy, Deputy Director-General delivered the welcome remark and Mr.Roland Treitler, Director of the project from GIZ also attended the meeting.

5 December 2017

The Department of Water Resource joined the merit-making ceremony to pay homage to the late King Bhumibol Adulyadej on the occasion of His Majesty the Late King Bhumibol Adulyadej's Birthday Anniversary, National Day and Father's Day at Dusit Palace.

11 January 2018

Mr. Worasart Apaipong, Director General and DWR executive visited and observed the Nam Nong Ta Kai Water Distribution Project, Meuang District, Udon Thani Province to accelerate the budget expenditure, follow up according to the operational indicators and find guidelines to solve the operation's problem and obstacle.

8 February 2018

Mr. Worasart Apaipong, Director General and DWR executive jointly followed up the performance result of Huai Kaew Reservoir Project with Water Delivery System along with delivering policies and encouragement for the officers in charge according to the government policy to create happiness for people in the project area of Huai Kaew Reservoir with Water Delivery System, Ban Rom Thong, Mae Fak Sub-district, San Sai District, Chiangmai Province.

9 February 2018

Mr. Worasart Apaipong, Director General of DWR visited and observed the Huai Prao Water Resources Conservation and Rehabilitation Project, Waing Tan Sub-district, Hang Chat District, Lampang Province in order to meet people in the area to listen to their opinions and release the fish together to provide the encouragement for people in the area.

7 March 2018

Mr. Worasart Apaipong, Director General and DWR executive visited and observed the Project of Huai Nam Kub Reservoir, Nong Ka Tao Sub-district, Nakorn Thai District, Pitsanulok Province and the Water Resources Conservation and Rehabilitation Project of the village to supply water for the consumption at Ban Pong Cher, Nuen Perm Sub-district, Nakorn Thai District, Pitsanulok Province. In addition, the Director-General also listened to the problem of people in the area that required DWR assistance to provide adequate water to use and support for a better living.

22 March 2018

On 22 March of every year is the World Water Day announced by United Nations: UN since 1992, the Ministry of Natural Resources and Environment by Department of Water Resources organized the event due to the World Water Day and National Resources Conservation Week 2018 at IMPACT Arena, Exhibition and Convention Center, Muang Thong Thani, Nonthaburi Province. The objective of this event was to disseminate and publicize the knowledge of water resources management and encouraged the government sector, public sector, people and youths to raise awareness about the importance of water. Besides, the events also had an exhibition under the theme "Waterway & Natural way" and the discussion to exchange common opinions on Water Resources Management of Thailand.

31 March 2018

Mr.Bhadol Thavornkitcharat, Deputy Director-General of DWR and delegation from Water Resources Regional Office 10 jointly followed H.E. General Surasak Karnjanarat, Minister of Natural Resources and Environment and delegation in the opening ceremony of the activity "Run for Rangers 2nd" at Ratchaprapa Dam, Ban Ta Khun Sub-district, Surat Thani Province. The objective of this event was to promote people's participation in forest protection as national treasure and a major tourist attraction which was valuable and internationally well-known. The net income after expense would deliver to support the fund for helping forest protection rangers who injured on their duty in responding to the World Ranger Day.

9 April 2018

Mr. Worasart Apaipong, Director General and DWR executive visited and observed the project site in responsible of Water Resources Regional Office 7 to follow up the operational result in the project areas. In addition, the Director-General also observed people's lives in the beneficial areas around the project site and answered the questions of local people who used water from the project to support their less water plantations such as eggplants and other vegetables which could increase the income of local people. Moreover, DWR delegation also visited the Surveillance Projects of Early Warning for Flood and Landslide which was the installation point of early warning station in Nong Phai Sub-district, Dan Makham Tear District in Kanchanaburi Province. In addition, the Director-General also provided the suggestions and regulations for the officers in charge to put into practice when the flood occurs so that people in the areas can receive information in a timely manner.

8 May 2018

Mr. Worasart Apaipong, Director General and DWR executive visited and observed the project site to follow up the project in responsible of Water Resources Regional Office 8 at Prau Bang Klam Water Resources Conservation and Rehabilitation Project, Bang Klam Sub-district, Bang Klam District in Songkhla Province, the Meteorological and Hydrological Station at the entrance of Songkhla Lake, Telemetering System of Songkhla Lake in Singha Nakorn Sub-district, Songkhla Province by Mr.Tosapol Sawatdisuk, Chief District Officer at Bang Klam together with the local leaders and people in the areas were jointly welcomed DWR delegation. In addition, the Director-General also provided the suggestions and regulations for the officers in charge to put into practice.

4 June 2018

Mr.Somnuk Sookchaoy, Deputy Director-General of DWR along with executives and officers from DWR's Central office and Regional office 1-11 jointly listened to the policy presentation of the Prime Minister and the discussion under the topic "Water resources Management Reform". In this regard, the Department of Water Resources jointly organized the exhibition under the topic of Early Warning for Flood and Landslide which currently installed at 1,545 stations, covering 4,911 villages and carried out the warning more than 6,000 times. And the residents can access the information through the Waterman in their local area or the DWR website: ww.dwr.go.th and Mobile Application "Early Warning".

5 June 2018

Mr.Bhadol Thavornkitcharat, Deputy Director-General was the representative from DWR to receive the Gold award for "Prototype Units of Reducing Solid Waste and Hazardous Waste in 2017" from the Ministry of Natural Resources and Environment in the event of World Environment Day under the concept of "Beat Plastic Pollution: If you can't reuse it, refuse it" to encourage people to reduce the use of plastics which the event took place at IMPACT Arena, Exhibition and Convention Center, Muang Thong Thani, Nonthaburi Province.

9 July 2018

Mr.Somnuk Sookchaoy, Deputy Director-General was the representative from DWR to receive honorary symbol of "Conservation of marine life" and marine and coastal resources information from General Prawit Wongsuwan, Deputy Prime Minister & Defence Minister of the Kingdom of Thailand in order to deliver to department's chief under the Ministry of Natural Resources and Environment at Santi Maitree Building, Government House

28 July 2018

The Department of Water Resources Management attended the ceremony of making merit and taking the oath of allegiance to be good civil servants to commemorate the auspicious occasion of His Majesty King Maha Vajiralongkorn Bodindradebayavarangkun's 66th birthday to express loyalty and gratitude in remembrance of His Majesty King at Royal Crematorium Sanam Luang and also jointly organized the exhibition to disseminate the mission of DWR.

6 August 2018

Mr.Worasart Apaipong, Director General and DWR executive visited the Water Resources Development Project in the area of Water Resources Regional Office 2 and listed to the briefing topic of project background, water demand and the water management of Pasak Jolasid Dam at meeting room of Plant Genetic Conservation Project under the Royal Initiation of Her Royal Highness Princess Maha Chakri Sirindhorn, Sab Champa Sub-district, Tha Luang District, Lop Buri Province

9 August 2018

The Department of Water Resources jointly coordinated with National Research Council of Thailand organized the exhibition, Thailand Research Expo 2018 at Centara Grand & Bangkok Convention Centre at Central World, Bangkok to disseminate the research result and activities of DWR. Moreover, all the research results and activities of DWR had brought Augmented Reality Technology (AR) to be presented in this exhibition so that they gained a lot of attention from students and other participants.

12 August 2018

Mr.Worasart Apaipong, Director General along with executives and officers from DWR organized a ceremony to commemorate the auspicious occasion of Her Majesty Queen Sirikit in the reign of King Rama IX's 86th birthday at the Department of Water Resources.

13 August 2018

The representative from Bureau of Research, Development and Hydrology had awarded the co-organizer to express gratitude for organizing the event, “Thailand Research Expo 2018” at Centara Grand & Bangkok Convention Centre at Central World, Bangkok which was the platform for the researchers to present their research result under the theme of Research for Resources and Environment so that 11 of research works received the certificate from the presentation.

3 September 2018

Mr.Worasart Apaipong, Director General and DWR executives visited and observed the Water Distribution System Project with solar power in the area of Huai Yai Water Resources Conservation and Rehabilitation Project, Ban Non Keng, Moo 5, Tob Hu Sub-district,Det Udom District, Ubon Ratchathani Province which Water Resources Regional Office 11 had dredged the pond to be able to store water at 336,483 m^3 and also constructed the drain buildings, water distribution system, high water tank, solar cells with supply pipes. Moreover, there were members of water users more than 60 people could increase their income at 3,000 - 4,500 baht/month.

20 September 2018

Mr.Bhadol Thavornkitcharat and Mr.Santiporn Nimkingratana, Deputy Director General along with executives and officers of DWR jointly organized the activity for the National River Conservation Day 2018 by specified Nakhon Chai Si River as a mainstream river of Thailand for encouraging people in Nakhon Pathom province to realize the value and create awareness to conserve the rivers for the next generation.

Part 5

Appendix

Our Sponsors

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Department of Water Resources
Ministry of Natural Resources and Environment
180/3 Rama 6 Road, Phayathai,
Phayathai, Bangkok 10400
Tel 1310 # 5
www.dwr.go.th