



# Integrated Water Resources Management in Thailand

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# Circle of water in Thailand

Rainfall 1,573 mm.

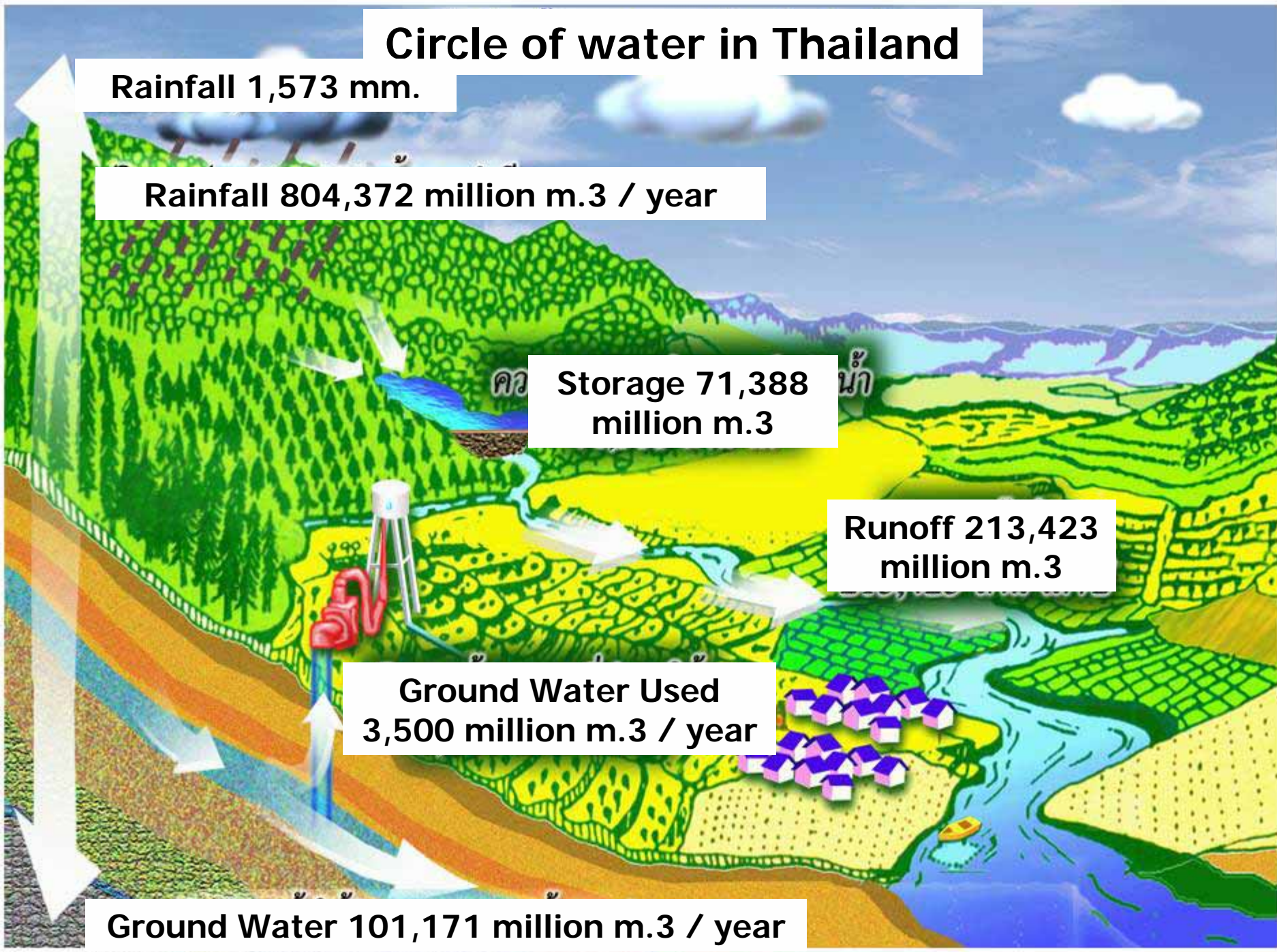
Rainfall 804,372 million m.3 / year

Storage 71,388 ล้านน้ำ  
million m.3

Runoff 213,423 million m.3

Ground Water Used  
3,500 million m.3 / year

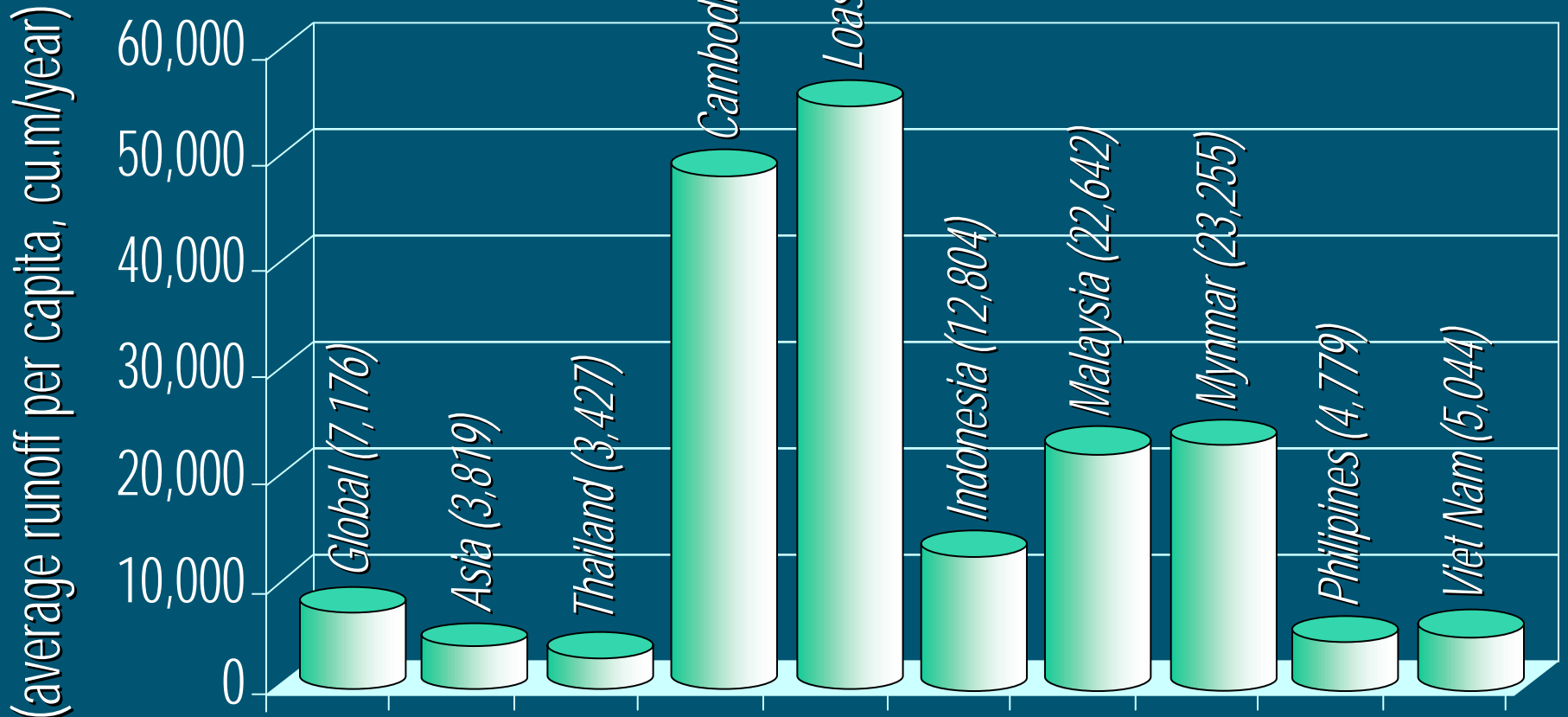
Ground Water 101,171 million m.3 / year





# General Information

- Total area 512,870 km<sup>2</sup>
- average annual rainfall 1,573 mm
- total volume of water 804,372 M.m<sup>3</sup>
  - (75%) evaporation, infiltration 590,949 M.m<sup>3</sup>
  - (25%) annual runoff 213,423 M.m<sup>3</sup>
- population 62,270,000
- average water/population 3,427 m<sup>3</sup>/person
- UN standard <1,000 m<sup>3</sup>/person
  - serious water shortage



## Average annual runoff per capita in Southeast Asia

# Surface water resources

Regions in Thailand	Catchment area	Average annual rainfall	Amount of rainfall	Amount of runoff
	(sq.km.)	(mm./year)	(mcm.)	(mcm.)
Northern	169,640	1,280	217,140	65,140
Central	30,130	1,270	38,270	7,650
Northeastern	168,840	1,460	246,500	36,680
Eastern	34,280	2,140	73,360	22,000
Western	39,840	1,520	60,560	18,170
Southern	70,140	2,340	164,130	49,240
<b>Total</b>	<b>512,870</b>	<b>-</b>	<b>799,960</b>	<b>198,880</b>

# Groundwater Resources

- More than 200,000 groundwater well were undertaken by both government and private with total capacity of about 9.58 million m.<sup>3</sup>/day (3,500 million m.<sup>3</sup>/year)
- 75 % of domestic water is obtained from groundwater sources which can be served approximately 35 million of people in villages and urbans area
- Groundwater is mainly recharged by rainfall of about 101,171 million m.<sup>3</sup> annually

# Water Provision and Water Demand

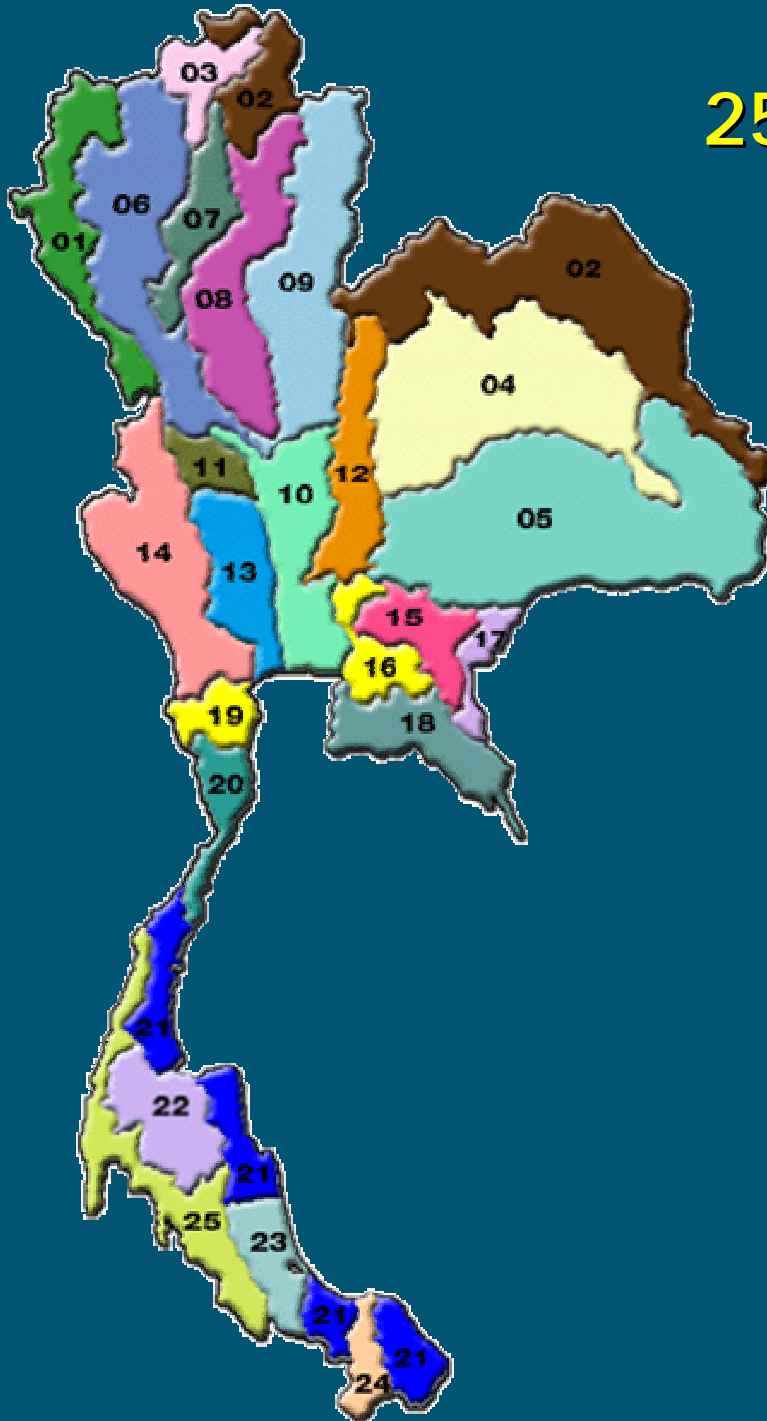
## Water Provision

- total runoff 213,423 mcm
- storage capacity (2005) 71,338 mcm
  - 650 large and medium scale projects
  - 60,000 small scale

## Water Demand

- estimated water demand (2005) = 67,232 mcm

# 25 River Basins in Thailand



Basin No.	Name of River Basins	Catchment Area (sq.km.)
01	Salawin	17,920
02	Mae Khong	57,422
03	Kok	7,895
04	Shi	49,477
05	Mun	69,700
06	Ping	33,898
07	wang	10,791
08	Yom	23,616
09	Nan	34,330
10	Chao Phraya	20,125
11	Sakaekrang	5,191
12	Pasak	16,292
13	Thachin	13,682
14	Mae Klong	30,837
15	Prachinburi	10,481
16	Bang Pakong	7,978
17	Longlesap	4,150
18	East Coast	13,830
19	Phetchaburi	5,603
20	Prachuap Khiri Khan coast	6,745
21	South East Coast	26,353
22	Ta Pi	12,225
23	Songkhla Lake	8,495
24	Pattani	3,853
25	South West Coast	21,172



# Water Provision and Water Demand:

## *Description of 25 River Basins in Thailand*

Name of River Basin	Catchment Area (sq.km)	Average Runoff (mcm.)	Storage capacity (mcm.)	Irrigation Area (rai)	Water Requirement (MCM./year)				
					Domestic Consumption	Tourism Industry	Ecological Balance	Irrigation Agriculture	Hydropower
Salawin	17,920	8,571	24.00	188,948.00	11.96	4.46	1,027.81	616.93	-
Mae Khong	57,422	19,362	1,551.00	1,692,333.00	132.57	1.98	1,145.69	4,323.33	-
Kok	7,895	5,279	30.00	520,767.00	14.90	0.43	680.00	401.39	-
Shi	49,477	8,752	4,246.00	1,863,173.00	195.17	49.62	573.33	3,052.82	2,156.00
Mun	69,700	26,655	4,255.00	1,819,785.00	337.88	94.30	956.63	2,628.85	591.30
Ping	33,898	7,965	14,107.00	1,942,927.00	75.26	1.00	457.27	2,428.20	3,623.00
Wang	10,791	1,104	197.00	472,350.00	20.21	1.00	48.00	487.42	45.00
Yom	23,616	3,117	98.00	994,205.00	53.87	0.08	315.36	859.13	-
Nan	34,330	9,158	9,619.00	1,780,637.00	66.29	0.32	315.36	2,870.80	2,583.00
Chao Phraya	20,125	22,015	33.00	5,731,375.00	1,594.40	646.05	1,250.00	8,768.59	-
Sakaekrang	5,191	1,297	162.00	436,410.00	8.62	-	3.35	878.75	-
Pasak	16,292	2,820	743.00	661,120.00	72.32	23.28	158.00	927.38	-
Thachin	13,682	22,300	416.00	2,385,259.00	94.94	310.25	1,000.00	4,292.11	-
Mae Klong	30,837	7,973	26,690.00	3,400,000.00	20.34	-	1,577.00	4,323.33	4,670.00
Prachinburi	10,481	5,192	57.00	733,862.00	8.08	2.78	377.00	838.32	-

# Water Provision and Water Demand:

## *Description of 25 River Basins in Thailand*

Name of River Basin	Catchment Area (sq.km)	Average Runoff (mcm.)	Storage capacity (mcm.)	Irrigation Area (rai)	Water Requirement (MCM./year)				
					Domestic Consumption	Tourism Industry	Ecological Balance	Irrigation Agriculture	Hydropower
Bang Pakong	7,978	3,713	74.00	1,353,263.00	14.18	9.05	946.00	2,243.60	1.94
Tonglesap	4,150	6,266	96.00	123,720.00	12.60	-	9.80	197.00	-
East Coast	13,830	11,115	565.00	427,000.00	129.10	83.50	74.70	578.46	79.00
Phetchaburi	5,603	1,400	750.00	562,688.00	14.30	2.90	67.00	1,110.00	693.00
Prachuap Khiri Khan Coast	6,745	1,420	537.00	327,015.00	18.00	2.97	39.10	1,383.00	-
South East Coast	26,353	23,270	5.00	1,780,481.00	56.40	8.70	161.70	1,129.10	2,577.00
Ta Pi	12,225	12,513	5,865.00	245,970.00	25.90	10.00	3,085.20	144.60	2,596.00
Songkhla Lake	8,495	4,896	28.00	905,550.00	56.45	37.50	312.00	2,994.70	-
Pattani	3,858	2,738	1,420.00	337,878.00	31.20	2.44	670.80	441.11	1,152.00
South West Coast	21,172	25,540	20.00	339,273.00	53.20	18.90	74.80	253.00	-
<b>TOTAL</b>	<b>512,066</b>	<b>244,431</b>	<b>71,388.00</b>	<b>31,025,989.00</b>	<b>3,118.14</b>	<b>1,311.51</b>	<b>15,325.90</b>	<b>48,171.92</b>	<b>20,767.24</b>
					<i>4.59%</i>	<i>1.93%</i>	<i>22.60%</i>	<i>70.90%</i>	

# Problems Faced in Water Resources Management

## National Level

- Policy and Plan
- Institutional Framework
- Budgeting
- Legal Framework
- Available Information

# Problems Faced in Water Resources Management

## Basin Level

- Management Mechanism.
- Participation of stakeholders.
- Involvement of Stakeholders in the Development Process.
- Conflict management.
- Sense of Ownership and Sharing of Responsibility.

# Strategic Planning and management Water Resources in Thailand

- National Level

- *National Vision & Policy*

- *Arrangement at National Plan and Budget Allocation*

- *Information network*

- *Water law*

- *Institutional Rearrangement*

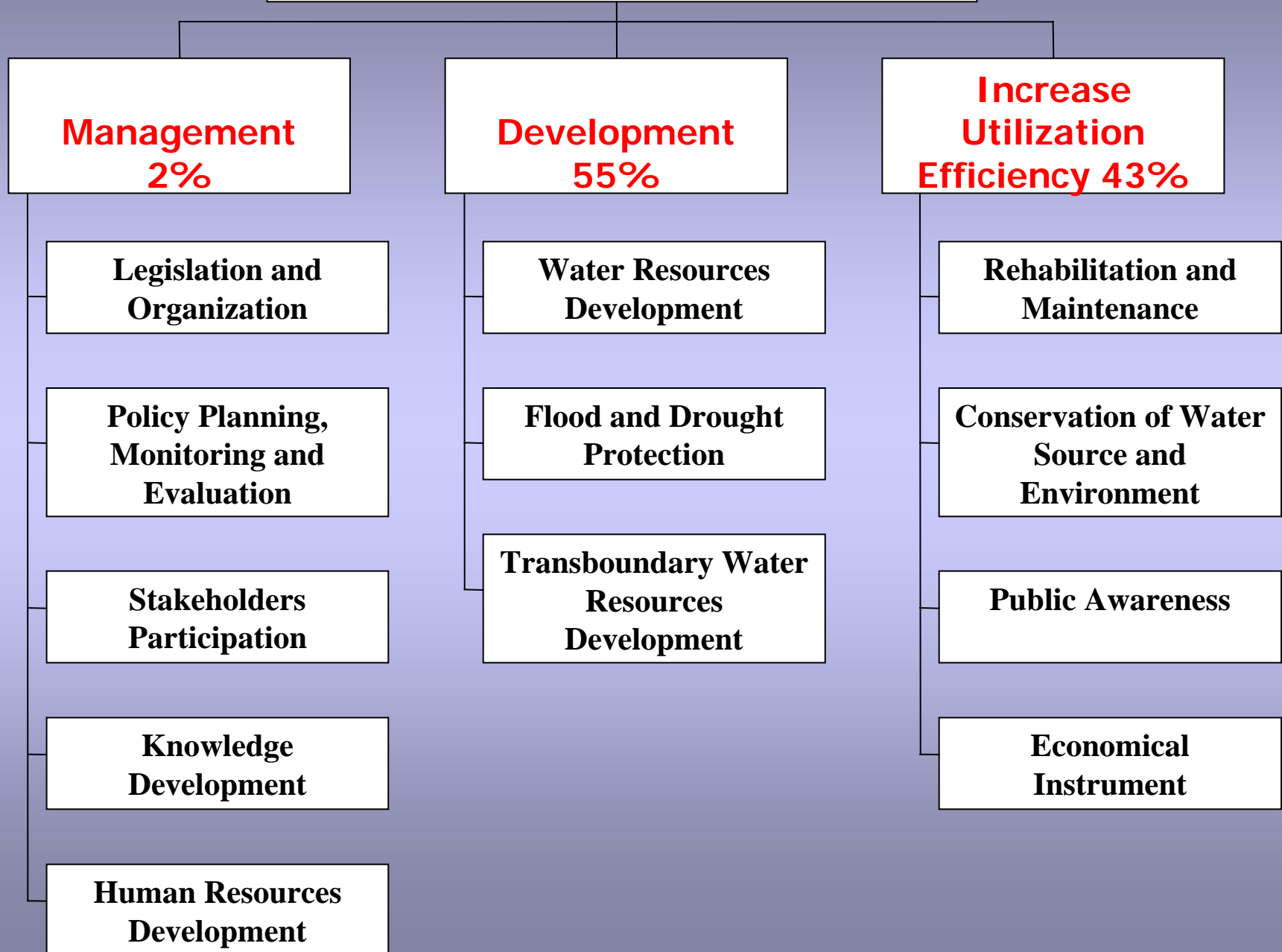




# *National Water Vision*

By the year 2025, Thailand will have sufficient water of good quality for all users through an efficient management, organizational and legal system that would ensure equitable and sustainable utilization of its water resources with due consideration on the quality of life and participation of all stakeholders.

# Water Sector Budget



# Cabinet

Other Ministry

Ministry of Natural Resources  
and Environment

NWRC

Other Department

DWR

DGR

RBC

Water Resources Regional  
office 1 - 10

Province  
Working Group

Amphoe  
Working Group

Provincial Operation  
(75 Provinces)

Tambon  
Working Group

Village working Group

# River Basin Organization

NWRC

Department of Water Resources

River Basin committee

RBC Secretariat Office

Provincial / Sub Basin WG

Working Group  
(Planning)

Working Group  
(Information)

Working Group  
.....

District Level WG

Sub District Level WG

Representative from Villages

# River Basin Committee

## Composition

	<b>Proposed Upper Mun</b>	<b>Thatapao</b>	<b>Upper Ping</b>	<b>Lowing Ping</b>	<b>Pasak</b>
<b>(1) Agency</b>	<b>18</b>	<b>14</b>	<b>15</b>	<b>17</b>	<b>16</b>
<b>(2) Water Users and Stakeholder</b>	<b>15</b>	<b>4</b>	<b>18</b>	<b>15</b>	<b>12</b>
<b>(3) Local Administration (PAO, TAO)</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>(4) NGO</b>	<b>6</b>	<b>2</b>	<b>2</b>	<b>6</b>	<b>3</b>
<b>(5) Academic, researcher, independent scholar</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>4</b>
<b>Total</b>	<b>42</b>	<b>23</b>	<b>41</b>	<b>41</b>	<b>34</b>



# **Integrated Basin Plan**

## **▶▶ Integrated**

- ▶ Development**
- ▶ Allocation + Utilization**
- ▶ Conservation**
- ▶ Flood Mitigation**
- ▶ Water Quality**

## **▶▶ Participation**

- ▶ Basin Organization**
- ▶ Agencies Concerned**

## **▶▶ Classification**

- ▶ Structural + Non Structural**
- ▶ Short term (5 yrs), Medium (10 yrs) and Long term (15 yrs)**

# **Result of Integrated Basin Plan**

## **1. Data base for Water Resources Management**

- **General Characteristic of River Basin**
- **Potential of Water Resources, Soil, Land use, Agriculture and Forest**
- **Socioeconomic and Environment of people in River Basin**

## **2. Integrated Basin Plan**

- **Water Resource Development Plan**
- **Water Resource Management Plan**
- **Drought and Flood Mitigation Plan**
- **Water Quality and Conservation Plan**

# Result of Integrated Basin Plan

## 3 Public Relation and Public Participation

- Sub-committee of River Basin
- Other Government Agency Concern
- Local Organization

## 4 Capacity Building of the Local Organization

- Public Relation
- Meeting with Working Group and Seminar
- Training on Planning Process

## 5 Water Resources Management Model

- Mike Basin

# Challenge facing water development and Management project in Thailand

## 1. Water Resources Development

- Increase of Storage Capacity
- Rainfed Area Development
- Groundwater Development
- Rehabilitation and Modernization of the Irrigation Project
- Upper Watershed Development

## 2. Water Resources Management

- Environmental Impact Assessment (EIA)
- Policy issues in the economical use of water
- The Draft Water Resources Law