



# **2<sup>nd</sup> Meeting of JWG on Water Resources of Mekong-Lancang Cooperation 1<sup>st</sup> – 2<sup>nd</sup> March, 2018 in Chiang Rai, Thailand.**



**Current situation and investment/development  
challenge regarding the Mekong River Basin  
Development**

## **In Cambodia**

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International Cooperation of Ministry of Water Resources and  
Meteorology ,**

# Contents

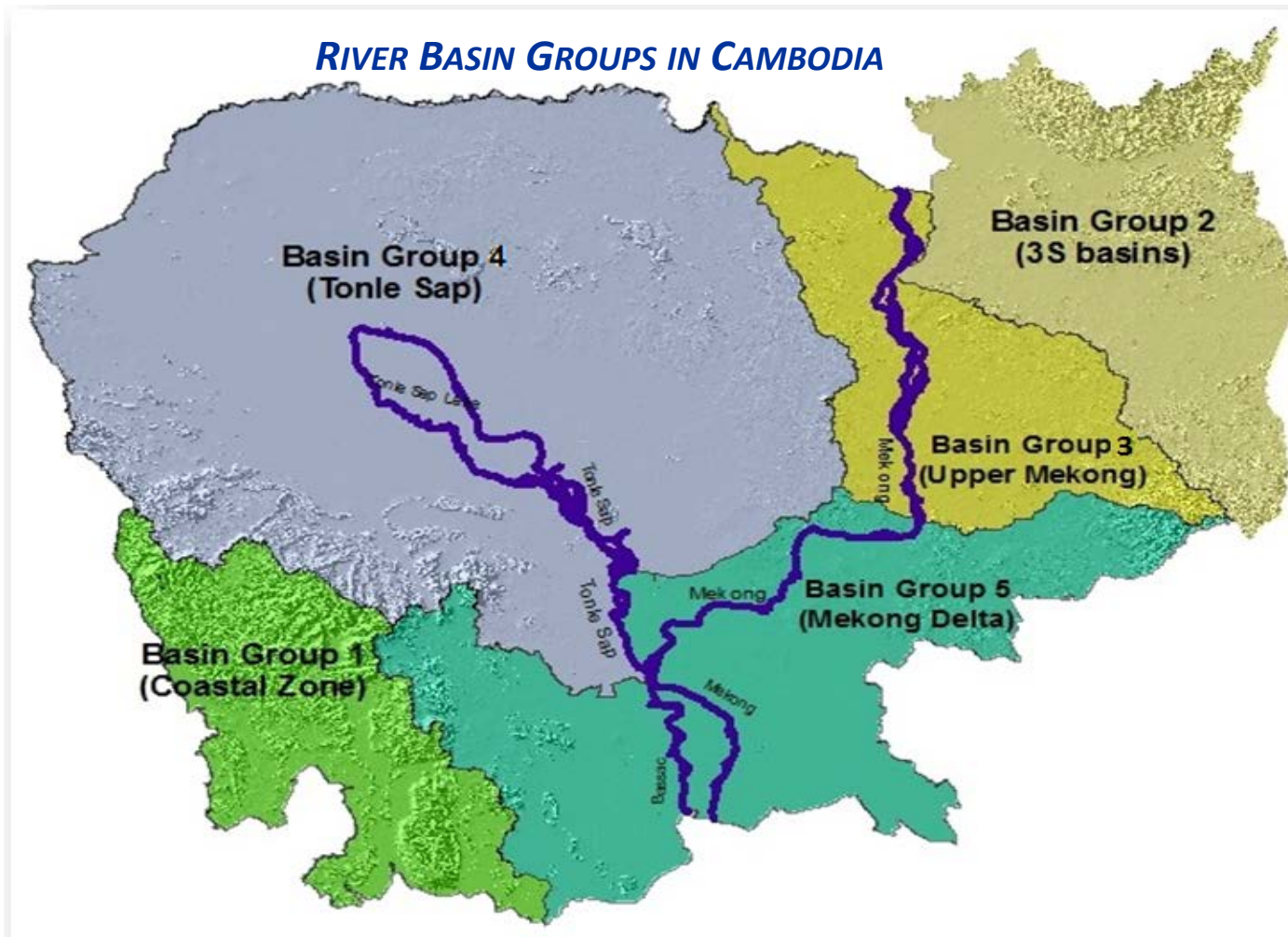
1. Current situation
2. Challenge
3. Investment
4. On Going Water Project

# I- Current situation

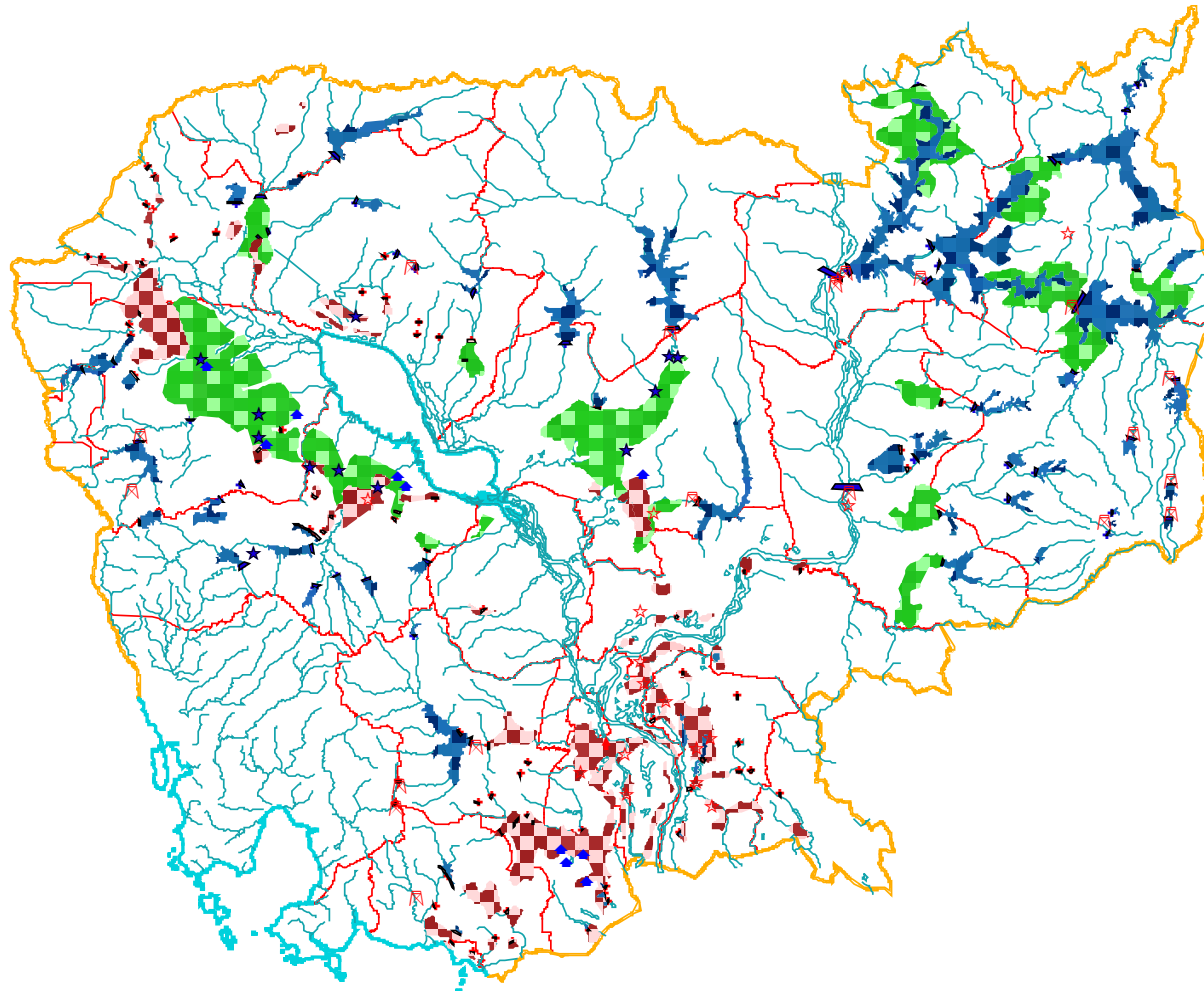
## INTRODUCTION

- Cambodia is a country that is considered to have abundant water, but in future years we expect that population growth and economic development will place rapidly increasing demands of water resources.
- Cambodia's flat-topography in the centre and south-east of the country creates shallow, wide storages in floodplains and wetlands along the mainstream of the Mekong River and tributaries
- 80% of Cambodia's population live in rural areas and more than 70% depend primarily on agriculture for their livelihoods. agriculture contributes 31% of the total national GDP.
- Continued development in agriculture sector remains an important government's strategy to reduce poverty in rural communities, achieve food security, and foster equitable and sustainable social development.
- Increasing rice exportation is current RGC's strategic plan.
- Expanding irrigated agriculture and ensuring water security for irrigation are top priorities to respond to the government's strategy mentioned above.

- IWRM is not being applied as required by the Water Law – Cambodia is still very much in a water development phase
- Groundwater is a vital resource in many areas, but is poorly understood and is not being managed.
- Cambodia's water resources assessment and monitoring are totally inadequate for management.
- While river basin management approaches are being piloted in some basins, the model for Cambodia is not being formalized.
- The limited amount of monitoring on water pollution and degradation is increasing as the economic sectors develop.
- Water catchments are not being identified and protected



## LOCATION MAP OF WATER RESOURCES PROJECTS IN CAMBODIA



### Legend

- ☆ Existing Pump Station for Irrigation
- ★ Planned Pump Station for Irrigation
- ▲ Pump Station for Drainage and Irrigation
- ▲ Pump Station for Drainage
- ⚡ Planned Hydroelectric Station
- Irrigated Surfaces (until 1990)
- Potential Irrigated Surfaces
- Existing/Planned Reservoirs
- Existing Dam
- Planned Dam
- ⊕ Existing Dam
- ⊕ Planned Dam
- ~ River/Stream
- Provincial Boundary
- International Boundary
- Great Lake/Sea

Source: Ministry of Water Resources and Meteorology, (1995) Original scale 1:500,000

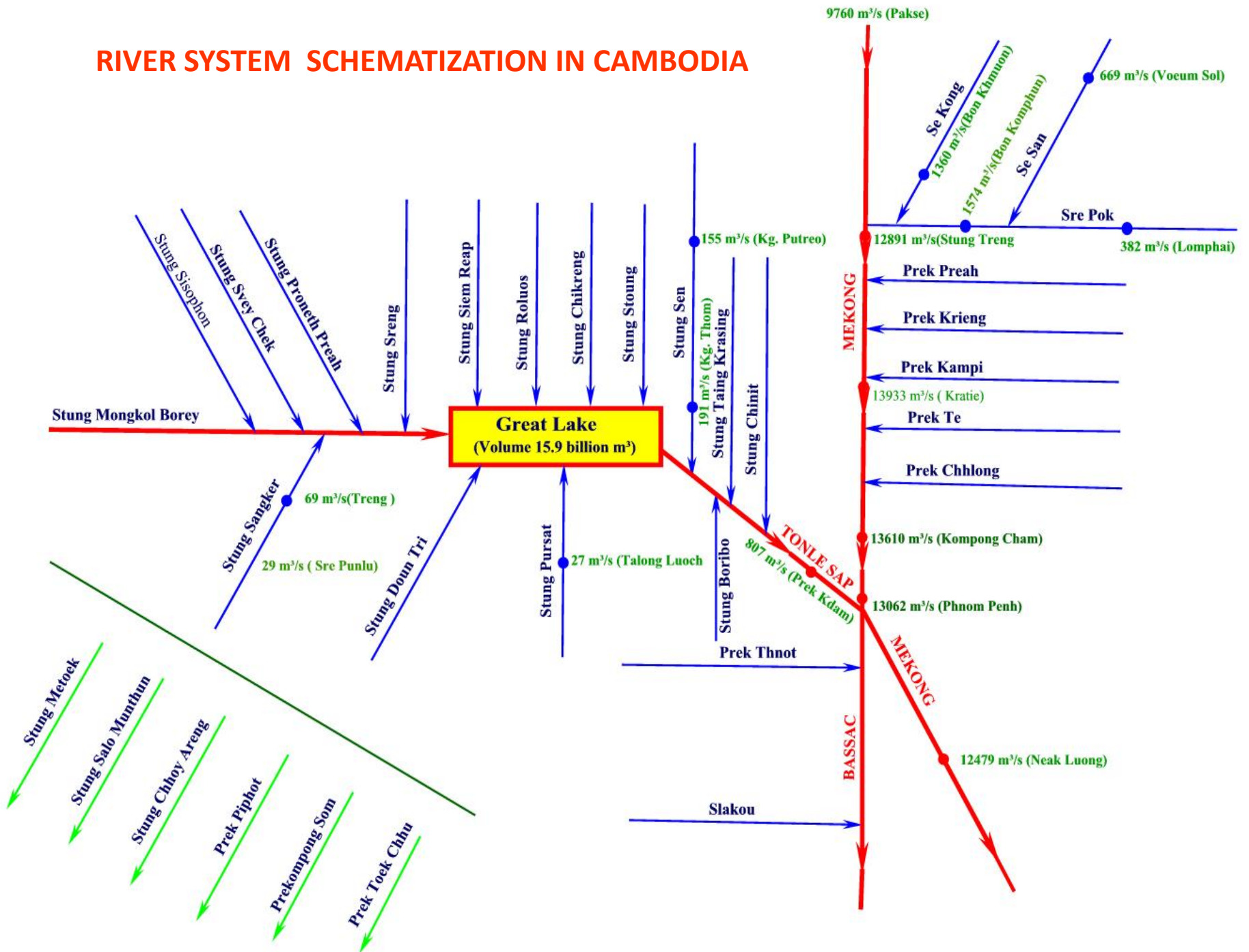


# Water Resources Potential in Cambodia

Referring to the previous study, the promising of Water Resources Project has a potential as follows:

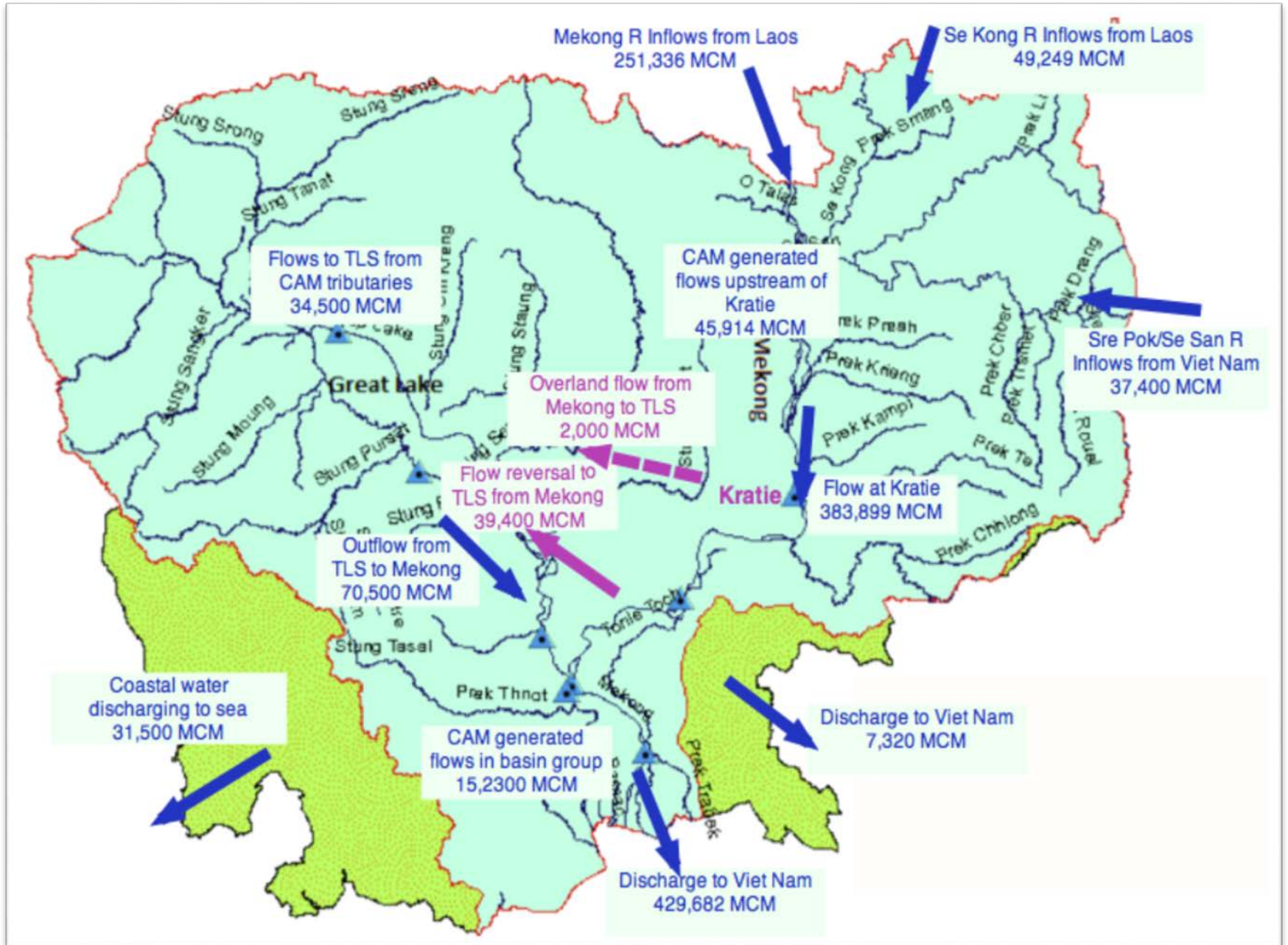
Water Resource	Power in MW	Irrigated Area in ha
Main Stream	10,800	734,000
Mekong Tributaries	2,727	253,000
Mekong Flooded Area	-	179,000
Tonle Sap Tributaries	306	358,900
Outside Mekong Basin	1,146	142,000
<b>Total</b>	<b>14,979</b>	<b>1,667,300</b>

# RIVER SYSTEM SCHEMATIZATION IN CAMBODIA





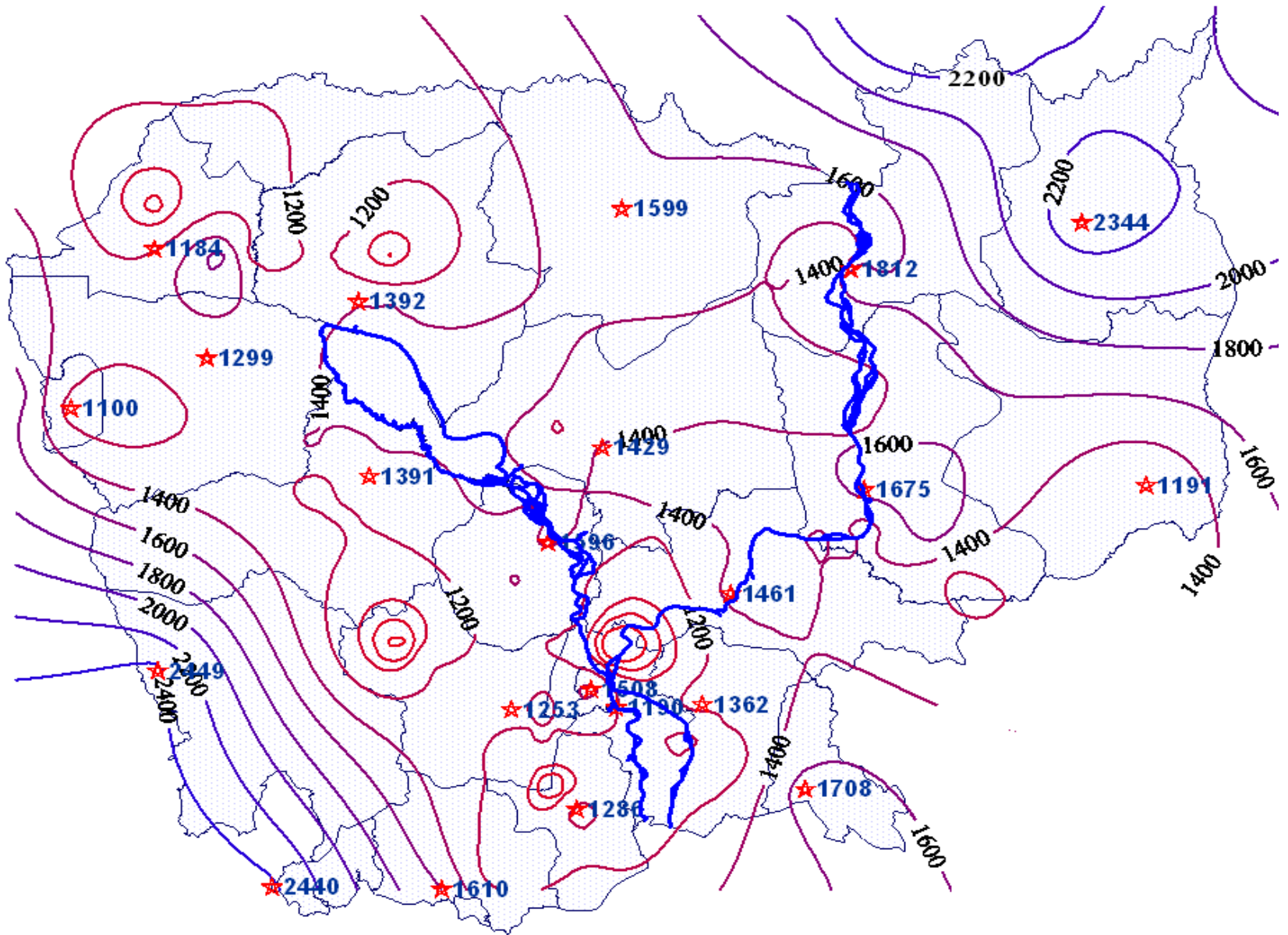
# Water Resource Occurrence and Movement Across Cambodia



# Cambodia river catchments

Basin Group	Code	River basin	Area (km <sup>2</sup> )	Basin Group	Code	River basin	Area (km <sup>2</sup> )
I	1	Prek Kampong Bay	3,018	III	30	Prek Preah	2,399
	2	Prek Toek Sap	1,529		31	Prek Krieng	3,331
	3	Prek Sre Ambel	2,653		32	Prek Kampi	1,142
	4	Prek Andong Toek	2,460		33	Prek Te	4,363
	5	Prek Trapang Rung	2,615		35A	Mekong Riverine (Downstream)	8,287
	6	Prek Tatai	1,619		<b>Sub-Total III</b>		<b>19,522</b>
	7	Prek Koh Pao	3,109		IV	12	Stung Krang Ponley
	8	Stung Me Toek	1,043	13		Stung Baribour	3,003
<b>Sub-Total I</b>		<b>18,046</b>	14	Stung Bamnak		1,116	
II	27	Tonle Se Kong	5,564	15		Stung Pursat	5,964
	28	Tonle Se San	8,021	16		Stung Svay Don Keo	2,228
	29	Tonle Srepok	12,380	17		Stung Moug Russei (Dauntry)	1,468
<b>Sub-Total II</b>		<b>25,965</b>	18	Stung Sangker		6,052	
V	9	Stung Toan Han	1,765	19		Stung Mongkol Borey	5,264
	10	Stung Slakou	2,485	20		Stung Sisophon	5,593
	11	Stung Prek Thnot	7,055	21		Stung Sreng	9,931
	34	Prek Chhlong	5,599	22		Stung Siem Reap	3,619
	35B	Mekong Riverine (Upstream)	2,086	23		Stung Chikreng	2,714
	37	Mekong Delta Cambodia	8,723	24		Stung Staung	4,357
	38	Mekong TS flood plain (Spean Troas)	1,508	25		Stung Sen	16,342
	36	Tonle Vaico	6,618	26		Stung Chinit	8,236
	<b>Sub-Total V</b>		<b>35,839</b>	39		Boeng Tonle Sap	2,743
			<b>Sub-Total IV</b>			<b>81,663</b>	
<b>TOTAL = 181,035 km<sup>2</sup></b>							

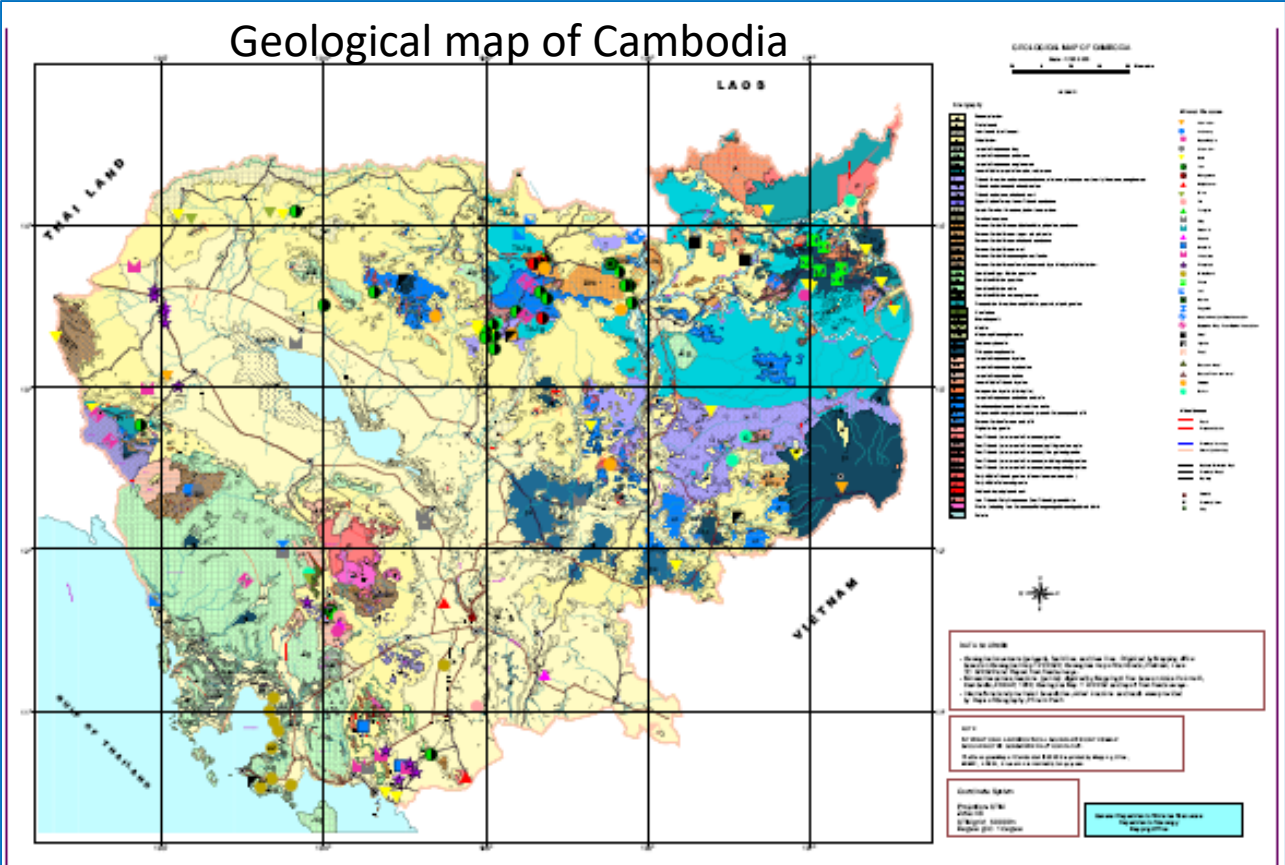
# Distribution of Annual Rainfall in Cambodia (1991-2007)





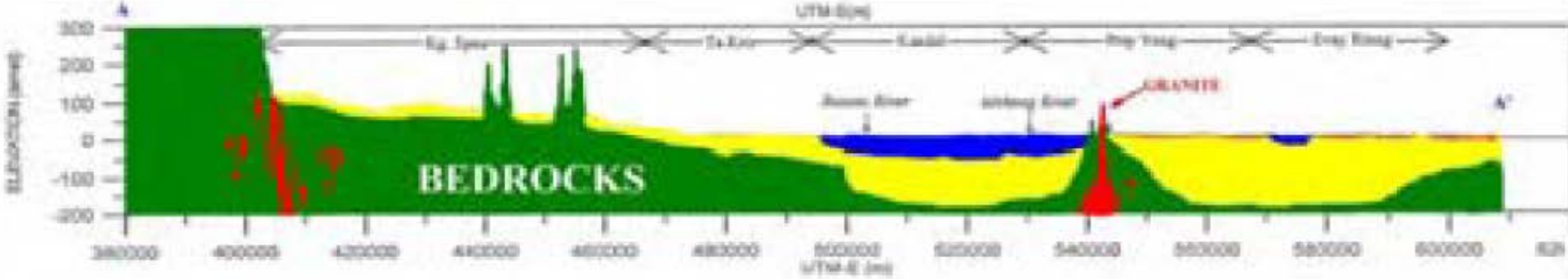
# Ground Water in Cambodia

## Geological map of Cambodia



Principal sources of Groundwater are in the:

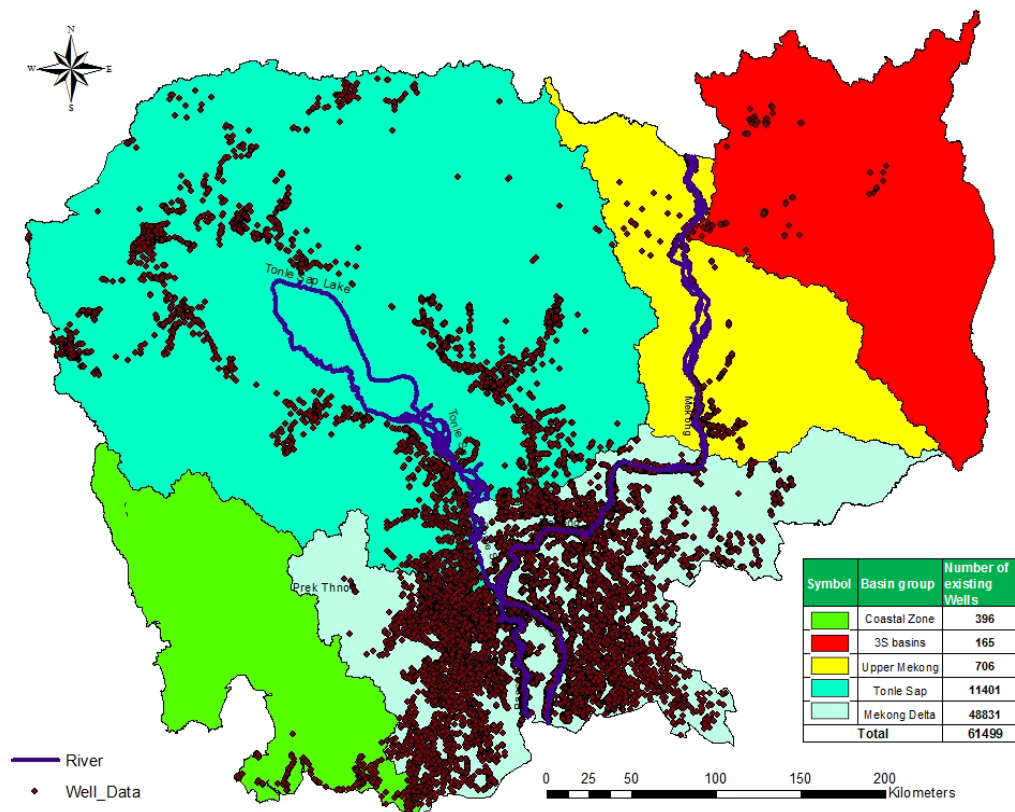
- *Young alluvium plain around the TLSGL and MK delta*
- *Old alluvium plain further from the lake shores*



Cross section of the geology of the Mekong Delta

# GROUNDWATER USE

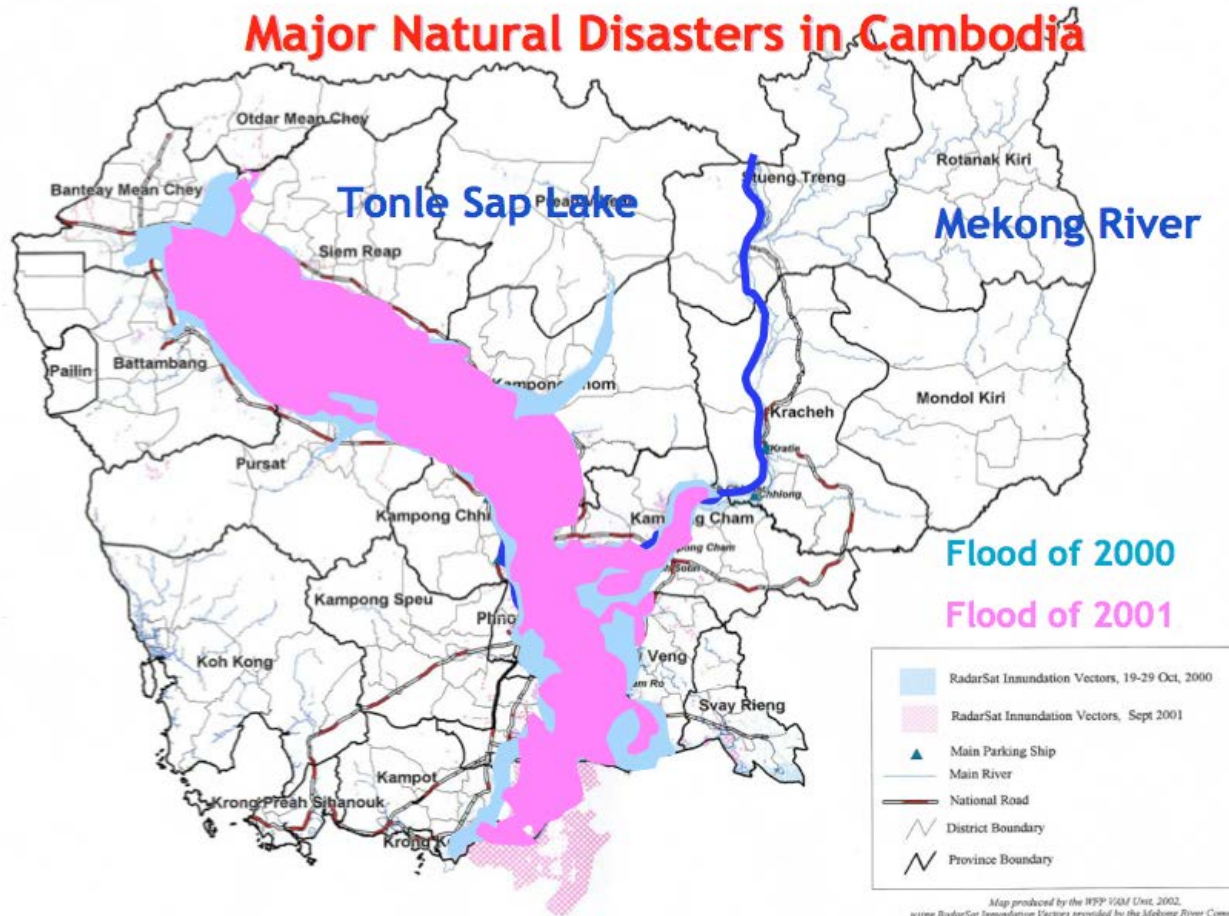
- Groundwater is widely used throughout the country, particularly in rural areas for domestic and drinking
- 53% of households depends on groundwater (270,000 wells)
- Contents
- Urban water supplies (Siem Reap, Prey Veng, Svay Rieng)
- Supplement irrigation (rice farming in Prey Veng and Svay Rieng provinces)



# II-Challenge

## 1- Too Much Water (Flood)

Extent of flooding in 2000 and 2001

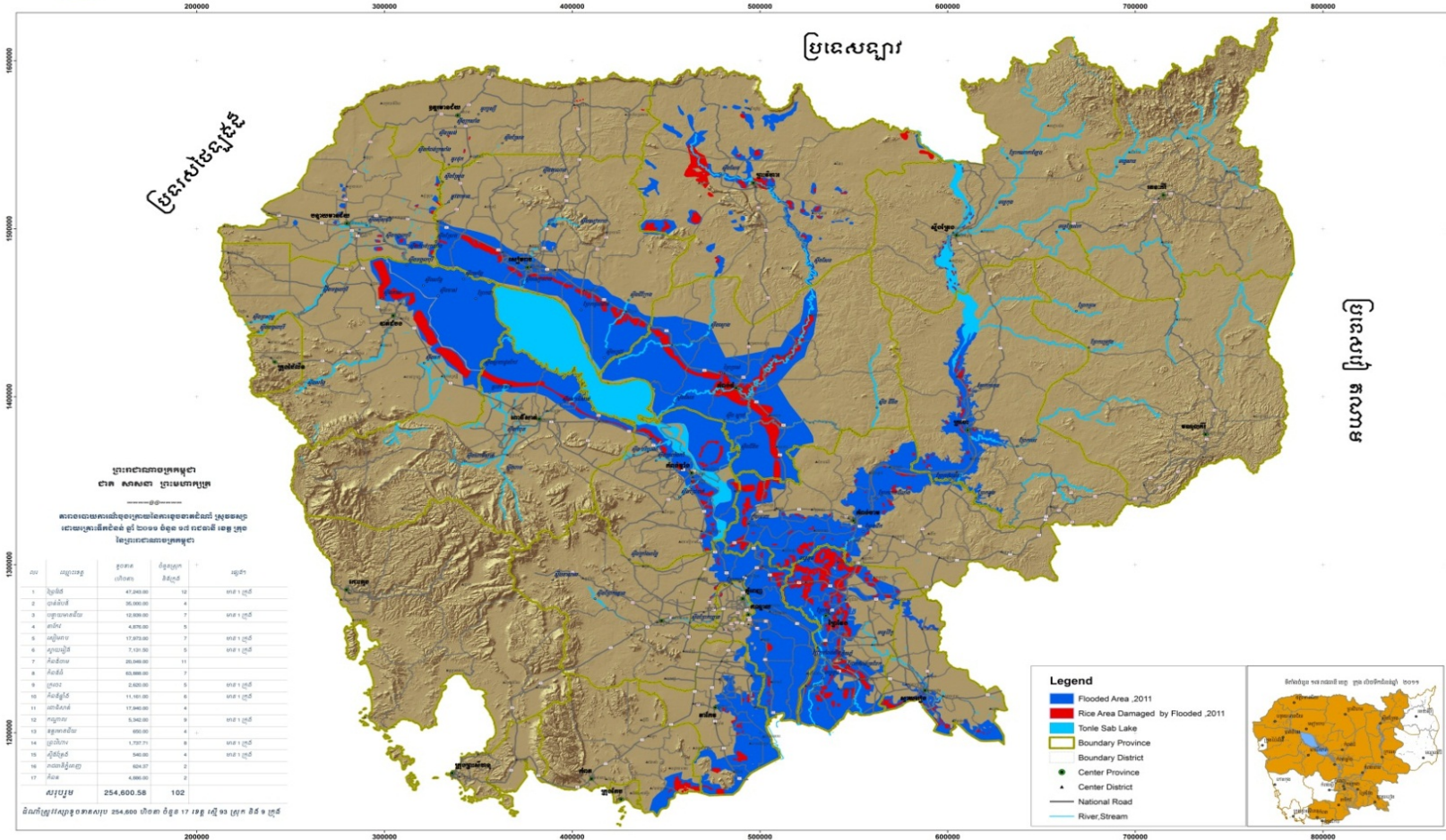




# Flood in 2011



ផែនទីបង្ហាញផ្ទៃដីលិចទឹក និងការខូចខាតដំណាំស្រូវវស្សា  
ចំនួន ១៧ រាជធានី ខេត្ត ក្រុង ដោយទឹកជំនន់ ឆ្នាំ ២០១១



# Mekong Flood





# Flash Flood in Rural





# Flash Flood in Urban









## 2- Too little water (Drought)









# Drought





# 3- River bank slide and bank erosion



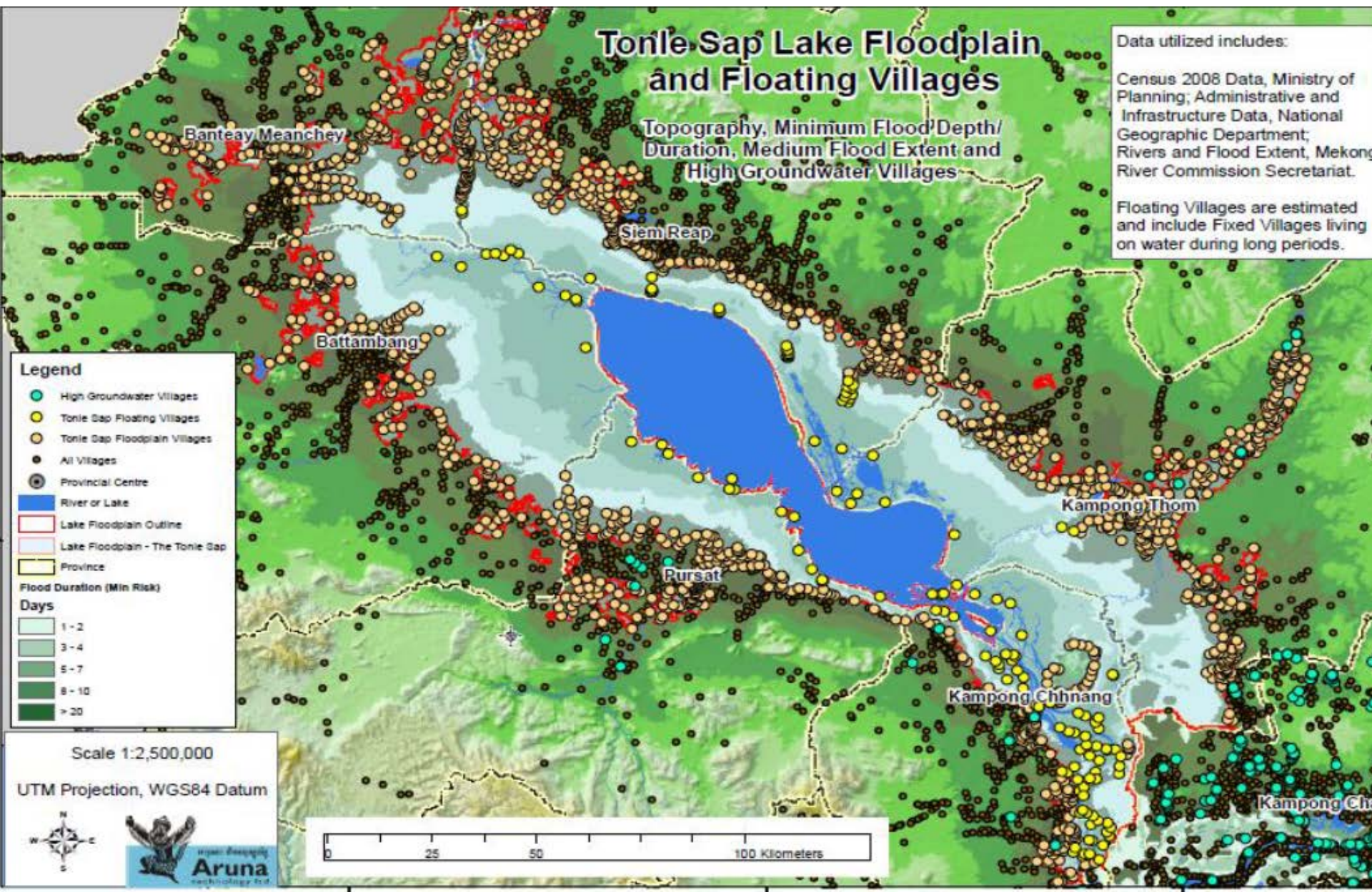


# *4- Increasing competition for water*

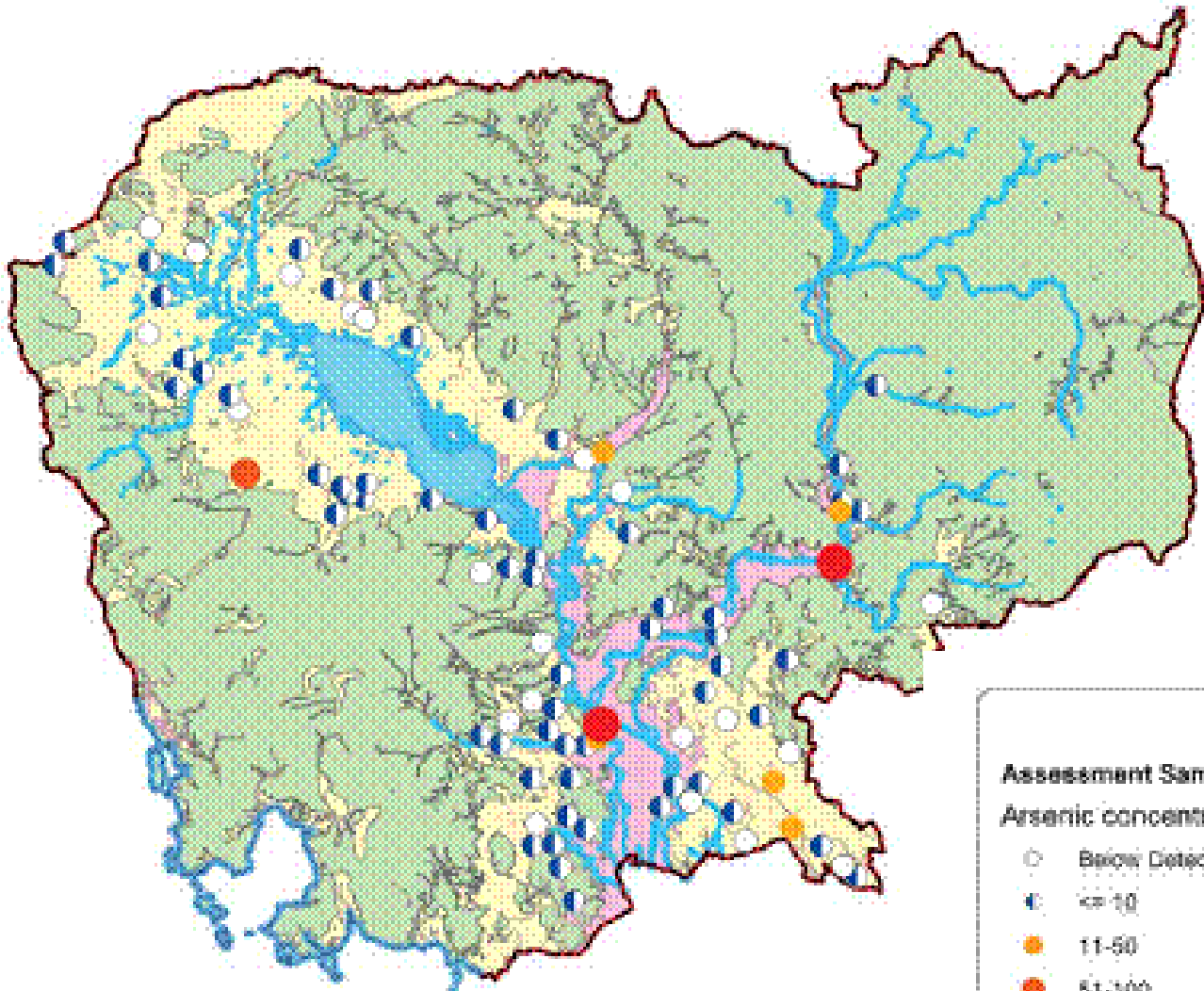




# 5- Zone with high risk of bacteriological contamination



# Arsenic contamination



**Legend**

Assessment Sample Sites	Arsenic Risk
○ Below Detection Limit	High
● < 10	Medium
● 11-50	Low
● 51-100	Rivers
● > 100	

0 30 60 120 160 240 Km.

# III-Investment

## 1- Legality Frame Works

### 1.1- Regional

- MRC 1995 Mekong Agreement

### 1.2 Transboundary

- MOU of Sharing of Water Used at the border (NMCs)
- Water Resources Development Plan (BDP)

### 1.3 National

- Cambodia Water Resources Management Law
- Sub degree on Famer Water Use Committee
- Sub Degree on River Basin Management
- Drafting Sub Degreed on Water Quality
- Drafting Bub degree on Water Licensing
- Water Policy
- Master Plan of Water Resources Management
- Strategic Plan of Irrigation Development



MRC  
basket  
fund

## Five Joint Projects

➤ Lao-Thai safety regulations for navigation

➤ Cross border WR Dev't and mang't, including env'tl **impact monitoring of Don Sahong HPP (Cambodia & Lao PDR)**

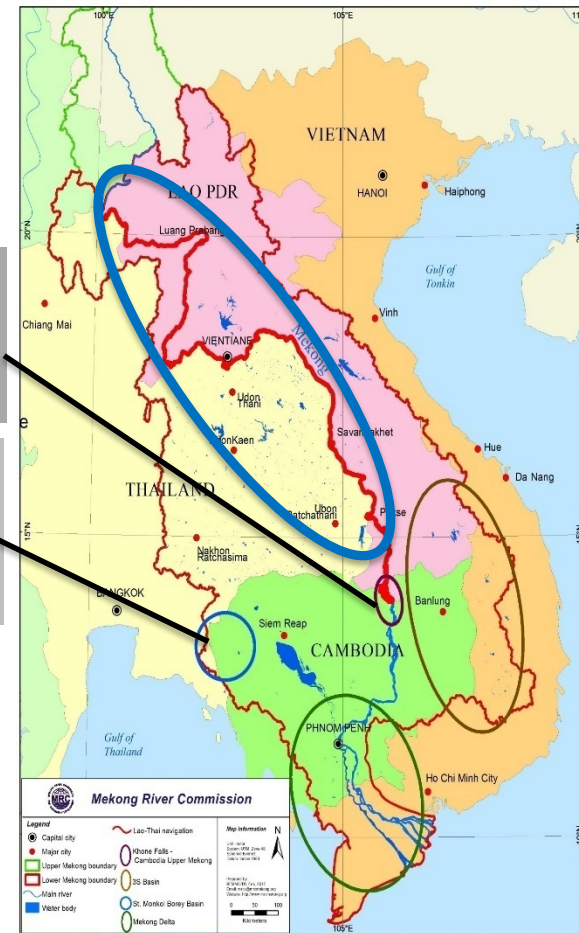
➤ Tb cooperation for **flood & drought mang't** in **Thai-Cambodian border area** – a part of the 9C-9T Sub-area

➤ **Sustainable WR dev't and mang't in 3S Basin (Cambodia, Lao PDR & Vietnam)**

➤ Integrated flood mang't in border area of **Cambodia & Viet Nam** in Mekong Delta for water security & sustainable dev't

GIZ  
support

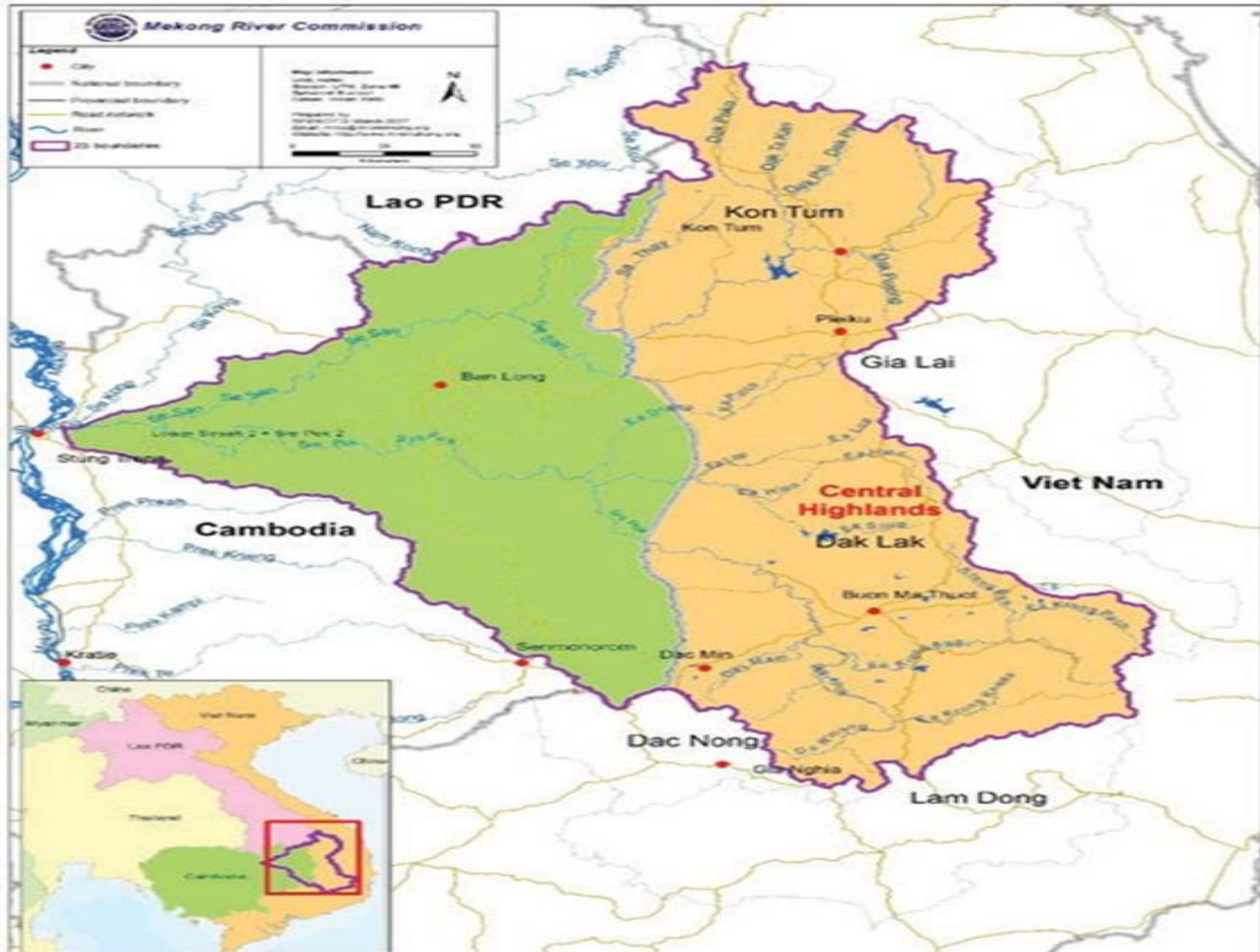
MRC  
basket  
fund



# Sustainable WR dev't and mang't in 3S Basin (Cambodia, Lao PDR & Vietnam)

Aribute	Sesan		Srepok	
	Cambodia	Viet Nam	Cambodia	Viet Nam
Basin Area (km <sup>2</sup> )	7,630	11,260	12,780	18,160
River Length	225	237	265	160
Elevation Range (m)	50-1,434	129-2,390	45-1,081	140-2,409
Population	95,603	896,812	128,074	2,139,470
Annual Precipitation (mm)	1,965	2,115	1,569	1,575
Irrigation (ha)	520	17,591	6,000	40,200
Number of Hydropower Dams	<ul style="list-style-type: none"> <li>- 1 existing</li> <li>- 1 under construction</li> <li>- 3 planned</li> </ul>	<ul style="list-style-type: none"> <li>- 6 existing</li> <li>- 1 under construction</li> </ul>	<ul style="list-style-type: none"> <li>- 1 under construction</li> <li>- 3 planned</li> </ul>	<ul style="list-style-type: none"> <li>- 7 existing</li> </ul>

# Administrative and Hydrological Boundaries of the Sesan and Srepok Project Area



# Water Resources Monitoring Stations in the Sesan and Srepok River Basins

Monitoring Station	Sesan		Srepok	
	Cambodia	Viet Nam	Cambodia	Viet Nam
Hydrological	3	2	1	4
Meteorological	4	3	3	2
Water Quality	1	1	0	1

# What science is needed for -

- Determining how much water is available
- Advising on sharing the water resource
- Advising on how to sustain the riverine environment, avoid mistakes
- Identifying risks to the water resource
- Monitoring availability and ecological impacts
- Assisting with clever, more efficient use of water
- Water policy formation and management
- Water infrastructure investment planning



# ON-GOING WATER PROJECTS

## ***Cooperation project and financial sources***

- ***Korea (EDCF-K Exim Bank): 3 Projects***
- ***Sala Ta Orn Dam Development Project***
- ***Dauntry Dam Development***
- ***Irrigation Development and Flood Mitigation Project in Bantey Meanchey***

## ***China (China Exim Bank) : 12 Projects***

- ***Sek Sork Multi-Purpose Dam Development***
- ***Stung Sreng River Basin Development***
- ***Irrigation Development of Vaico phase- 2***
- ***Master Plan of Water Resources Management***

# ON-GOING WATER PROJECTS

## ***Japan (JICA): 4 Projects***

- ***Rehabilitation Irrigation and Drainage System at West of Tole Sap Lake***
- ***South-West Flood Mitigation and Irrigation Development***
- ***Technical Service for Irrigation***
- ***Flood Protection in Phnom Penh City***

## ***ADB: 4 Projects***

- ***Damnak Chhoue Krom Irrigation and Flood Mitigation Project***
- ***Water Resources Management and Development***
- ***Upper Land Irrigation Development***

# ON-GOING WATER PROJECTS

## ***WB: 2 Projects***

- *Mekong IWRM*
- *Strategic Plan of Irrigation Development*

## ***India: 2 Projects***

- *Rehabilitation Tasal Reservoir in Preak Thot River*
- *Study of Master Plan of Siem Reap River Basin Development*

## ***France (AFD) : 2 Projects***

- *North-West Irrigation Development*
- *Regulate flow of wet land (Rehabilitation of Colmatage Canal)*



**THANKS**