

Asia Water Cycle Symposium

The University of Tokyo, Tokyo, Japan, 9-10
January 2007

Prepared by : Long Saravuth/ Hydrologist

Department Hydrology and River Works/MOWRAM

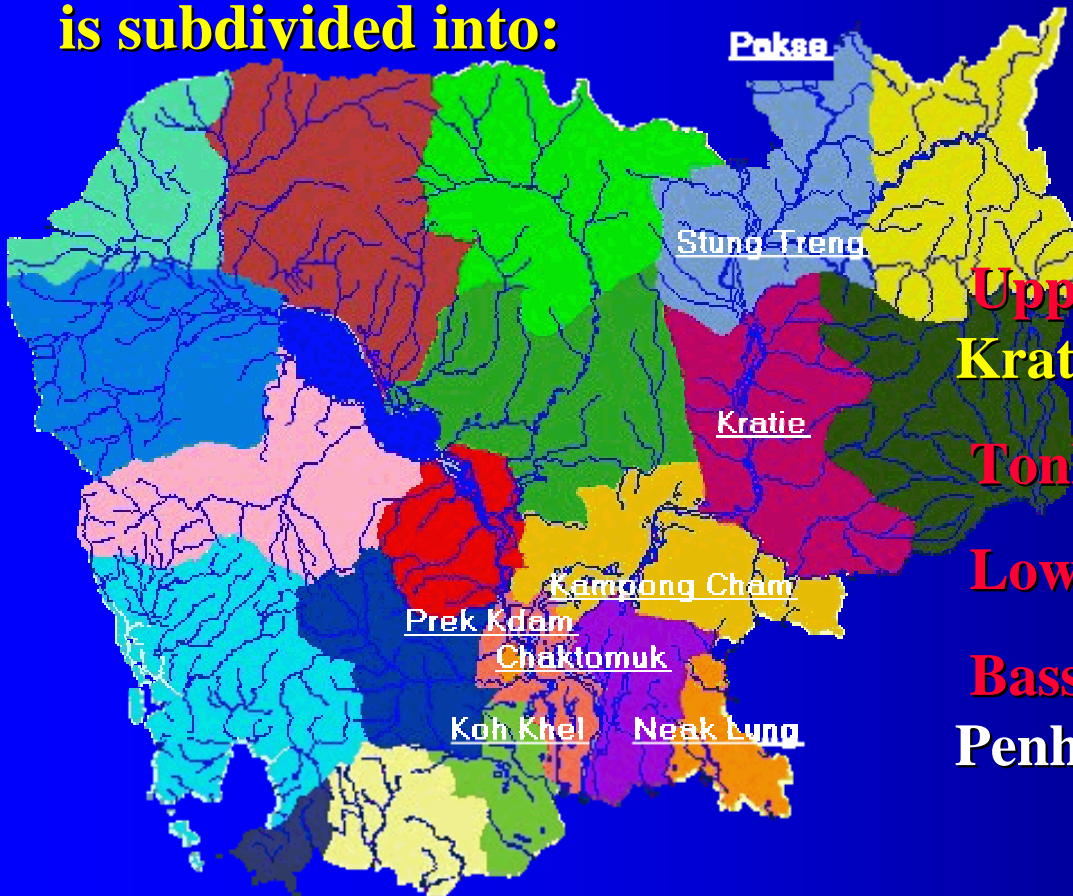
E-mail address : lsaravuth@online.com.kh

CONTENTS

- I. Introduction***
- II. Flood Problem and River System in Cambodia***
- III. Water Resource Potential and River Basin***
- IV. Database Management***
- V. Propose Pilot area Stung Sen River Basin***
- VI. Conclusion***

Introduction

- ◆ In Cambodia, Mekong flows across with $L \approx 500$ km and Area more than 80 % of country territory.
- ◆ at Chaktomuk (Phnom Penh) conjunction, upper Mekong is subdivided into:



Upper Mekong: Stung Treng;
Kratie; Kampong Cham.

Tonle Sap: Prek Kdam;

Lower Mekong: Neak Lung;

Bassac: Chaktomuk (Phnom
Penh) and Koh Khel.

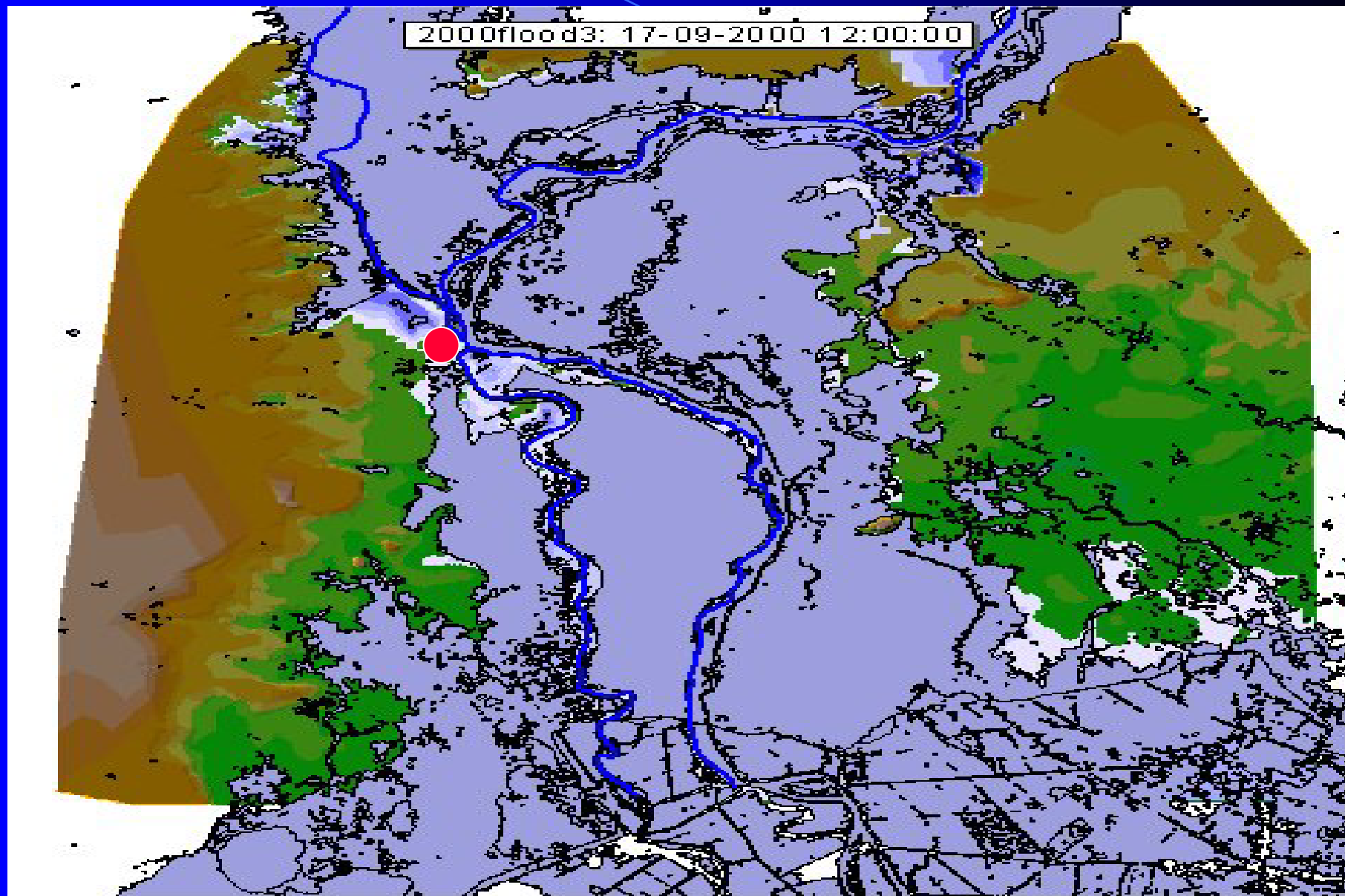
Introduction cont

- Total population 13 million, 52.2% are female and 47.8% are male;
- An average growth 2.4%;
- Population density of 51% per sq. km;
- 85.4% living in rural area, 7.7% in urban area and 6.9% in Phnom Penh.

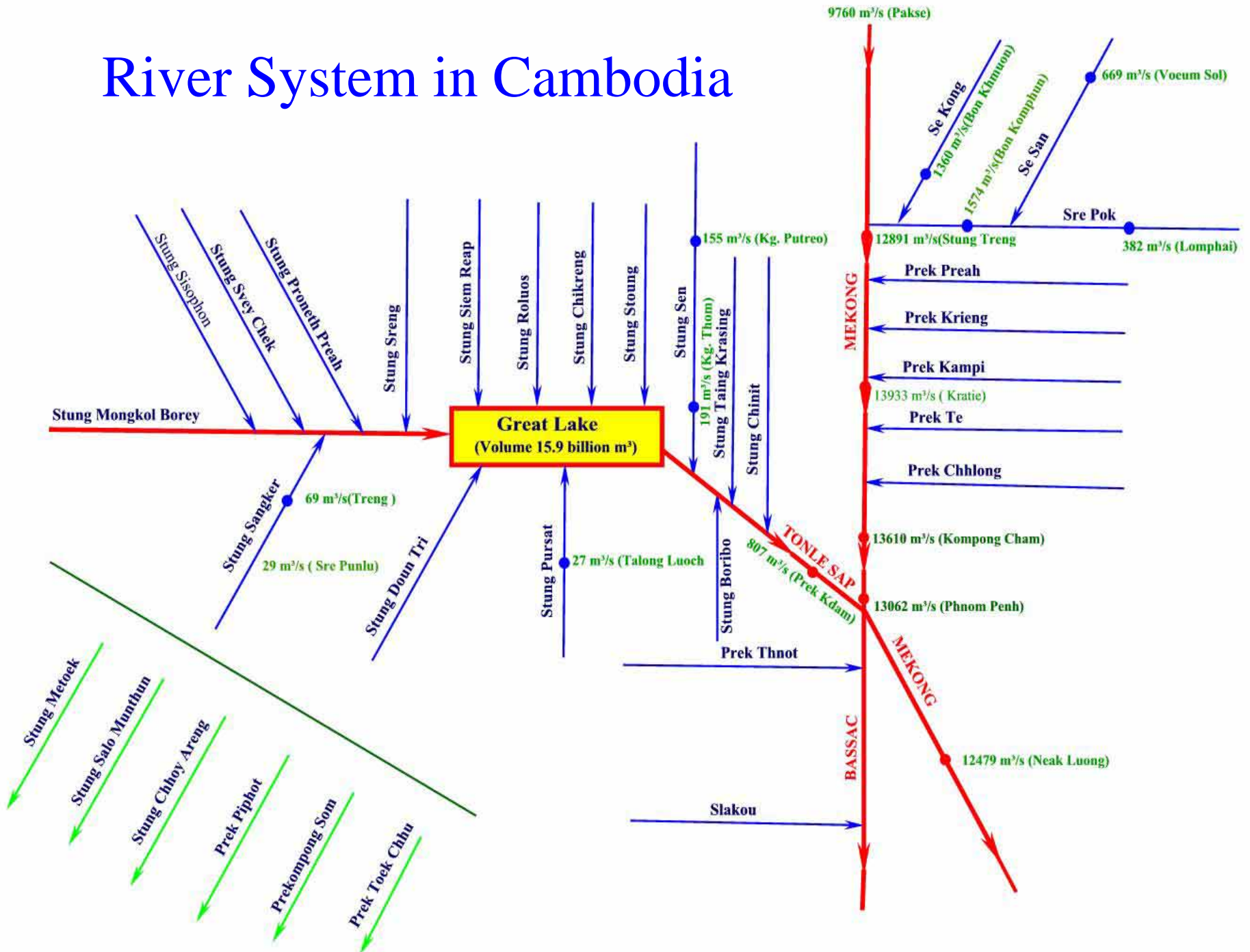
Current per capita GDP of 292 USD;

- 38% of households are living under poverty line in general;
- 90% of household in rural areas are living under poverty line;
- 85% of total population are employee of agriculture sector.

Flood Problem and existing flood control measure



River System in Cambodia



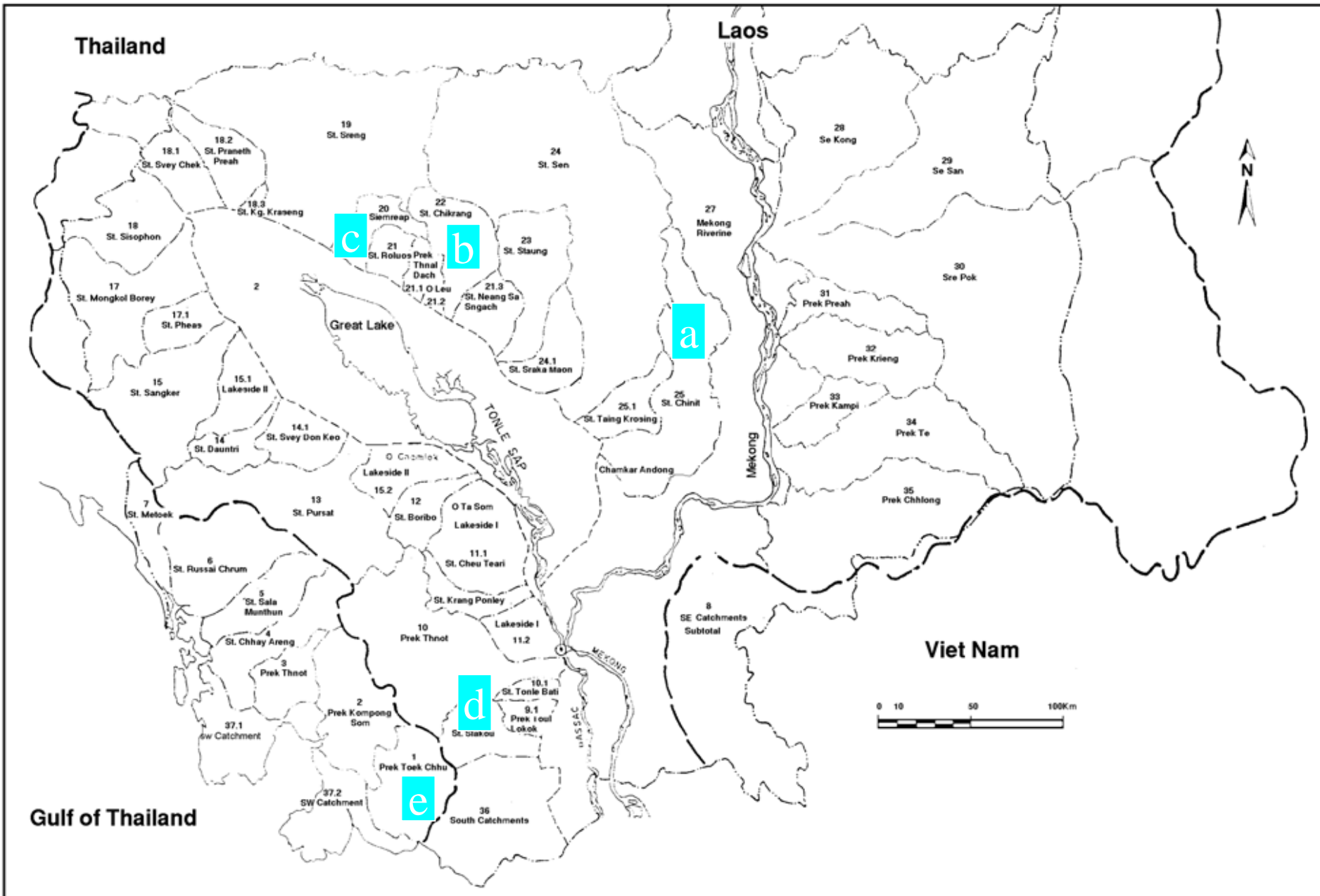
Water Resource Potential in Cambodia

Water Resource	Power (MW)	Irrigated Area (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
Total	14,979	1,667,300

River Basin Studies in Cambodia

Basin	Provinces	Prime focus	Support	Status
a. St.Chinit	Kampong Thom	Irrigation	ADB/AFD	Ongoing
b. St.Chikreng	Siem Reap	Irrigation	AFD	Completed 2002
c. St. Siem Reap	Siem Reap	Watershed	MRC	Completed 2002
d. St. Slakou	Takeo	Irrigation	JICA	Completed 2001
e. St. Kbal Chhay	Kampong som	Watershed	DANIDA	Completed 2005

Location Map of the rivers basin studies



Database Management

Shearing Hymos Database

The screenshot displays the HYMOS software interface, which is used for hydrological modeling and database management. The main window shows a map of Thailand with numerous station markers (red triangles) and their corresponding IDs (e.g., 110414, 130503, 140401). The interface includes a menu bar (Edit, View, Select, Options, Window, Help) and a toolbar with various icons for navigation and editing.

On the right side, there are several panels for data management:

- Stations: 1**: Shows the selected station ID (110414) and name (Tuol Khpos).
- Start Date:** 1990/01/01
- End Date:** 1991/12/31
- TimeBase:** Day
- Divider:** 1
- Parameters: 23**: Shows "All parameters".
- Series: 1**: Shows "110414 PH 1987/01/01 to: 2000/12/31".

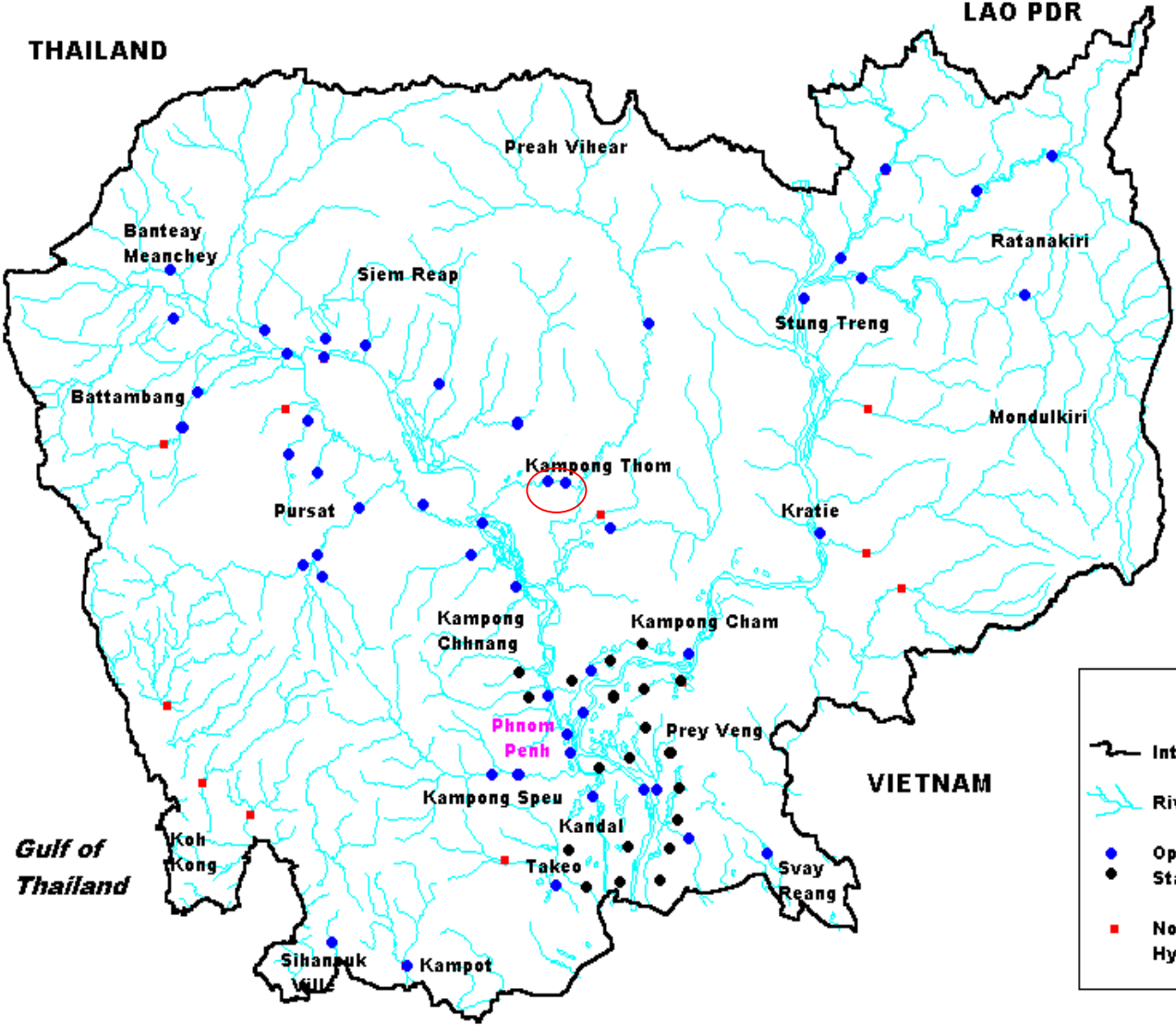
At the bottom right, there is a "HYMOS Functions" panel with a tree view and a "Go to Function" button:

- Entry and Edit
 - Stations
 - Series
 - Series Characteristic
 - Series Remarks
 - Edit Data
 - Stage Discharge
 - Relations
 - Show DataBase Tables
 - Catchment Characteristic
 - Parameters

Buttons for "Graph", "View", "Report", "Save", and "Export" are also visible.

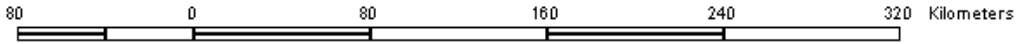
The status bar at the bottom indicates the current node: "Node: 110414, Tuol Khpos".

MAP OF HYDROLOGICAL NETWORK IN CAMBODIA

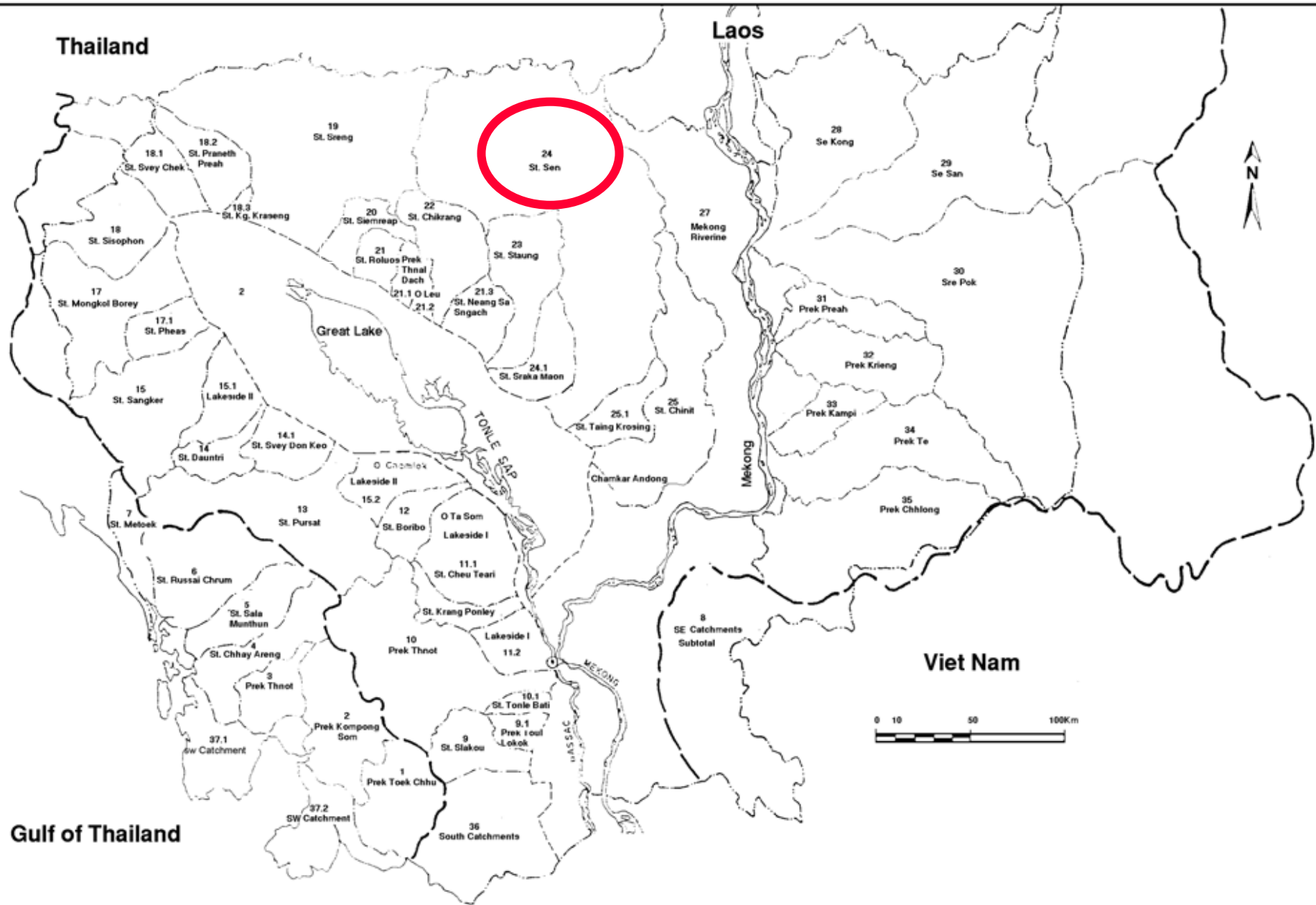


LEGEND

- International Boundary
- Rivers/Streams
- Operational Hydrological Stations
- Stations
- Non-operational Hydrological Stations



Location Map of the rivers basin Propose for Study



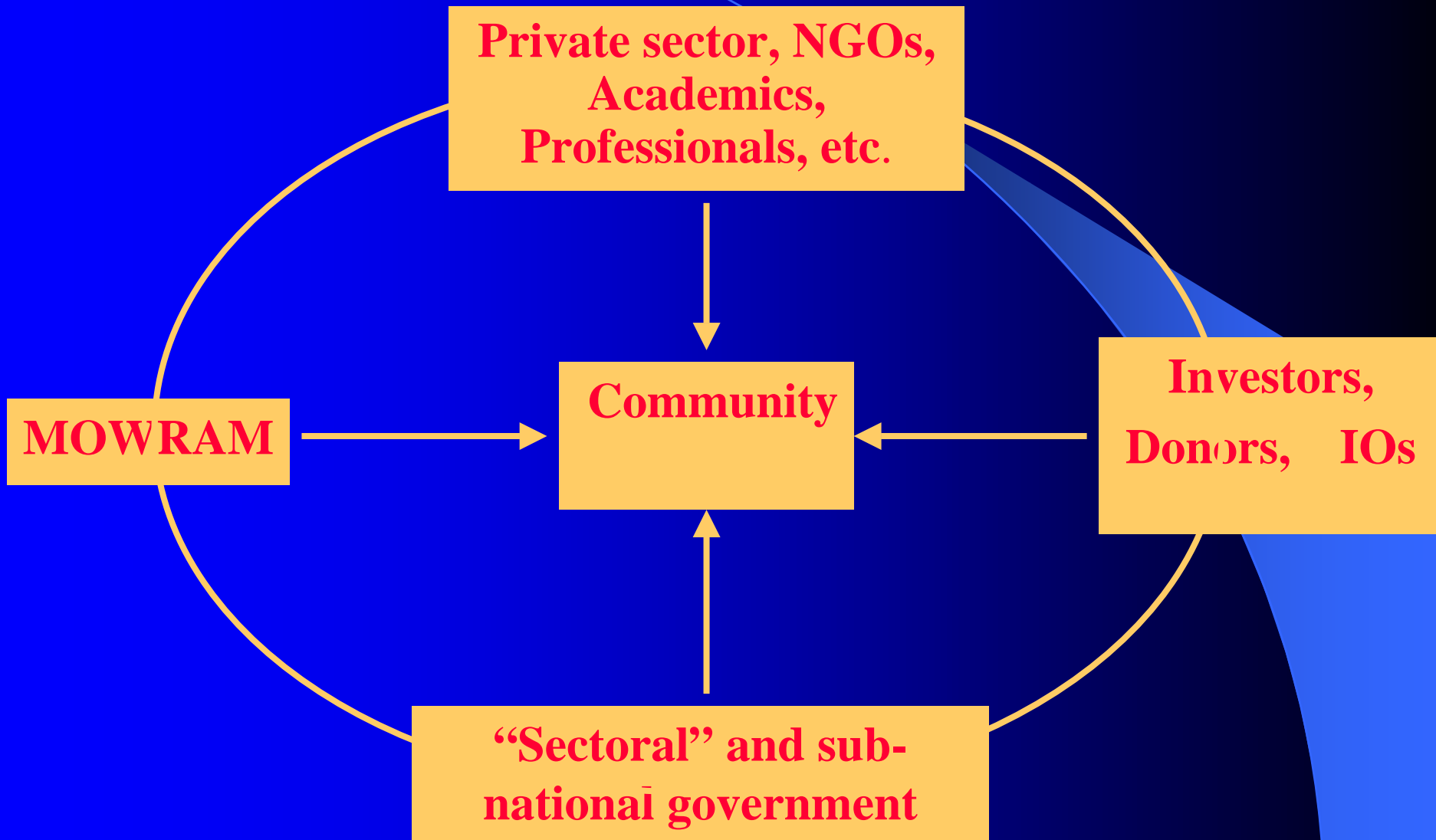
Station selection for Proposals

No	Code	Station	River	Area.Km2	Lat	Long	Datum HT	Remarks
1	014501	Stung Treng	Mekong	635.000	133200	1055807	36.79	
2	014901	Kratie	Mekong	646.000	122806	1060009	0.48	
3	019802	Kg.Cham	Mekong	660.00	115907	1052709	-0.93	
4	019806	Neak Loung	Mekong		111537	1051713	-0.33	
5	033401	Chak Tomuk	Bassac		113307	1045509	-1.02	
6	033402	Koh Khel	Bassac		112700	1050200	-1.00	
7	020102	Prek Kdam	Tonle Sap	84.400	111107	1044807	0.08	
8	020103	Kg.Chhnang	Tonle sap		121559	1044106	-2.62	
9	020106	Kg. Loung	Tonle Sap		123424	1041242	0.64	
10	430102	Seam Pang	Sekong	23.500	148000	1062200		NS
11	440102	Veoun Sai	Sesan	16.300	135758	1064845	46.00	TB
12	450101	Lum Phat	Sre Pork	25.600	132814	1065904	42.00	
13	610101	Kg. Thom	Stung Sen	14.000	126536	1045444	-2.99	
14	610102	Kg. Putrea	Stung Sen	9.080	133118	1051247		
15	580101	Pursat	Stung Pursat	4.480	123108	1035506	10.94	
16	580103	Bak Trakoun	Stung Pursat					NS
17	640102	Thnous Loung	Stung Prek Thnot	4.022	112714	1042955		
18	640103	Pearm Kley	Stung Prek Thnot		112733	1042114	39.31	
19	550102	Battambang	Stung Sangke	3.203	130517	1031222	-1.73	
20	550101	Treng	Stung Sangke	2.135	124900	1030600	33.03	

Institutional Basis related to river basin management .

1. Cambodia National Mekong Committee
2. Ministry of Water Resources and Meteorology
3. Ministry of Industry, Mine and Energy
4. Ministry of Rural Development
5. Ministry of Public Work and Transport
6. Ministry of Environment
7. Ministry of Agriculture, Forestry and Fisheries

Linkages in WRM :



River Basin Management – Relevant Processes



The role of civil society and community participation in WR management

- Water resources management in Cambodia is carried out largely by civil society .
- Agriculture is the largest user of water , in terms of volume.
- About 85% of farmers are engaged in rain-fed cultivation .
- Medium and large irrigation systems are managed by the MOWRAM and PWDRAM.
- FWUC are being establish to take responsibility for operation & maintenance. At present about 100 FWUCs have been establish.
- Other principal area of water resources management & development is water supply. This area is responsible by the government-owned company, and in the provincial – private sector company.

Conclusions / Recommendations

- Cambodia is a country that is considered to have abundant water resources and its play an importance role for national economic development in many areas such as : agriculture, hydropower, navigation, tourism, industry, environmental protection and daily life.
- Cambodia 's river basins in general are in good condition in comparison with many others countries in Asia. IWRM and RBO are necessity to create opportunities for the management conservation & development and to ensure suitable environment aspect.
- Build Capacity and train on IWRM to the MOWRAM staff at all level
- The existing hydrological network in Cambodia is still ideal by aerial coverage density comparing to the networks of neighboring countries.
- Need DEM data, Air photo data
- Need Assistance and Support for data collection, database management and Modeler.

Thank you for your attention

