

JAPAN INTERNATIONAL COOPERATION AGENCY
THE MINISTRY OF INDUSTRY, MINES AND ENERGY
THE ROYAL GOVERNMENT OF CAMBODIA

THE STUDY ON
WATER SUPPLY SYSTEM
FOR SIEM REAP REGION
IN CAMBODIA

FINAL REPORT
Vol. III SUPPORTING REPORT

JUNE 2000

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LIST OF REPORTS

Vol. I	EXECUTIVE SUMMARY
Vol. II	MAIN REPORT
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Exchange Rate Applied

1.00 US\$ = 3,800 Riels = 120.00 Yen

(as of June 1999)



LEGEND

	Capital
	Capital of Province
	National Road
	National Boundaries
	Provincial Boundaries
	Railway

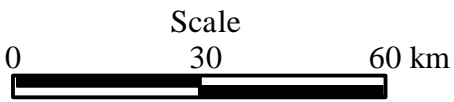
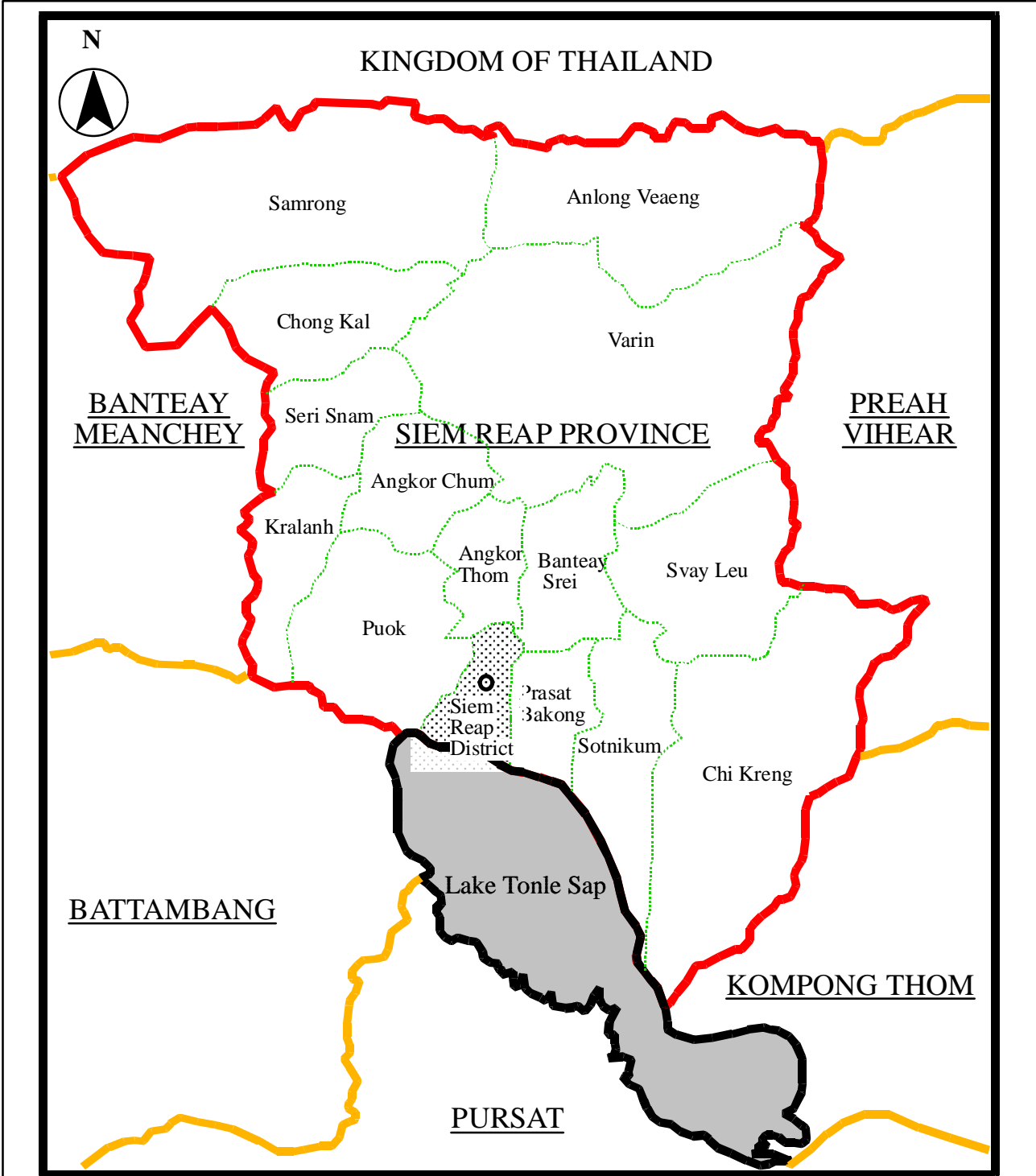


KEY MAP

The Study on Water Supply System for Siem Reap Region in Cambodia

Location Map of Cambodia

Japan International Cooperation Agency

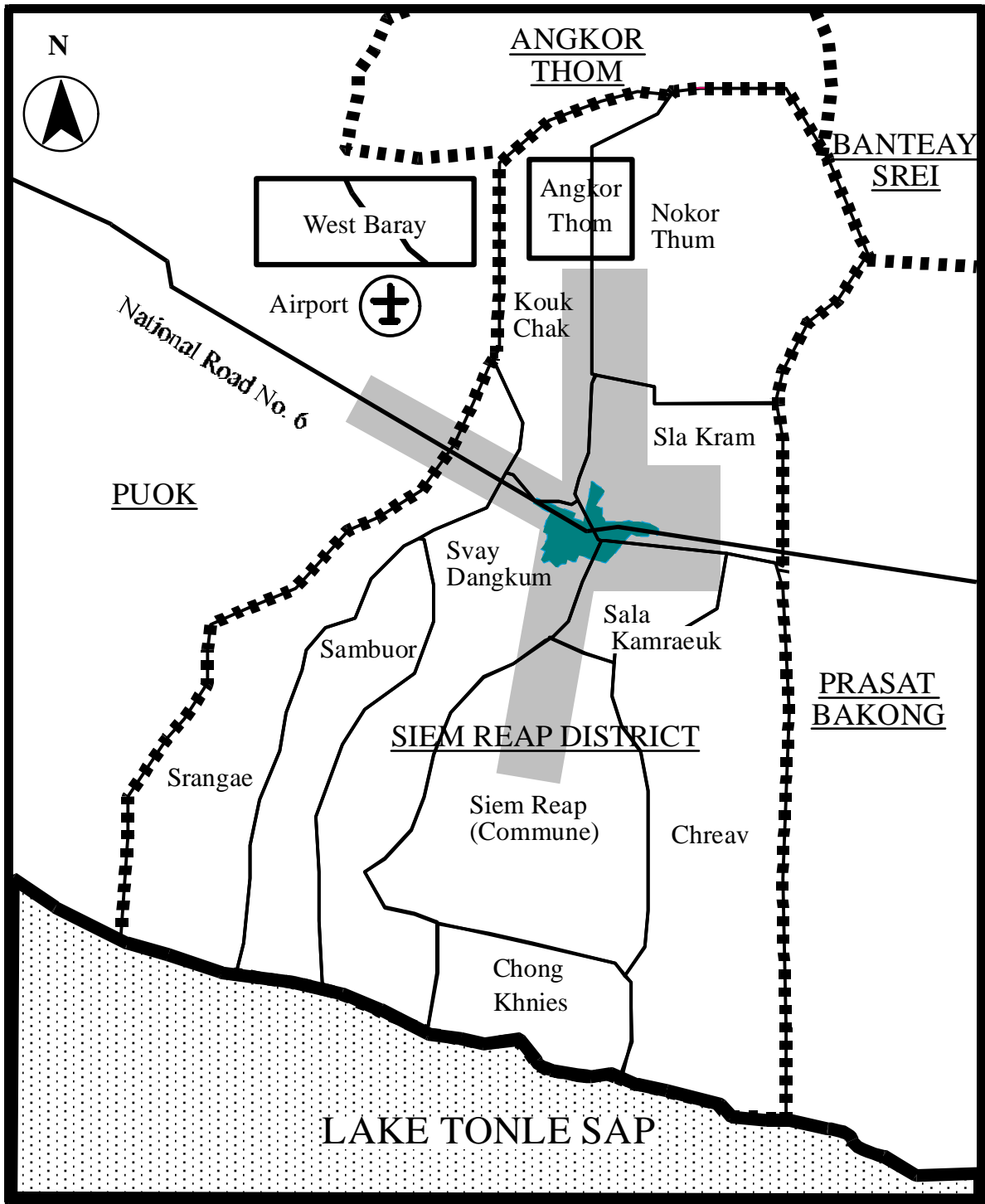


Legend	
<u>PURSAT</u>	: Province Name
Svay Leu	: District Name
	: Provincial Boundaries
	: District Boundaries
	: Siem Reap Town

The Study on Water Supply System for Siem Reap Region in Cambodia

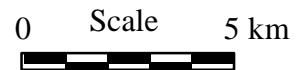
Location Map of Siem Reap Province with District Names

Japan International Cooperation Agency



Legend

<u>SIEM REAP</u> : District Name	— : Commune Boundaries
Sla Kram: Commune Name	■ : Social Survey Area
■■■■■ : District Boundaries	■ : Water Supply Service Area



**The Study on Water Supply System
for Siem Reap Region in Cambodia**

**Location Map of Study Area
with Commune Names**

Japan International Cooperation Agency

**THE STUDY ON WATER SUPPLY SYSTEM
FOR SIEM REAP REGION IN CAMBODIA**

**FINAL REPORT
Vol. III SUPPORTING REPORT**

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ABBREVIATIONS

ACP	Asbestos Cement Pipe
ADB	Asian Development Bank
AFD	French Agency for Development
AIDS	Acquired Immune Deficiency Syndrome
APSARA	Authority for the Protection of the Site and the Management of Angkor Region
ASEAN	Association of Southeast Asian Nations
B/C	Benefit-Cost Ratio
BOD	Biochemical Oxygen Demand
CARERE	Cambodian Area Rehabilitation And Re-generation
CAD	Computer Aided Design
CFD	Caisse Francaise de Developpement (French Development Bank)
COD	Chemical Oxygen Demand
CPA	Complementary Package of Activities
CPI	Consumer Price Index
CRF	Capital Recovery Factor
D	Depth
DDT	Dichlorodiphenyl Trichloroethane
Dept.	Department
DFID	Department For International Development, UK
DIP	Ductile cast Iron Pipe
Div.	Division
DO	Dissolved Oxygen
DSR	Debt Service Ratio
DWL	Dynamic Water Level
EC	Electric Conductivity
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
EL	Elevation Level
EU	European Union
FAO	Food and Agriculture Organization
FBC	Feed Back Committee

FIRR	Financial Internal Rate of Return
F/S	Feasibility Study
GAD	Gender and Development
GAMS	General Algebraic Modeling System
GDP	Gross Domestic Product
GIS	Geographic Information System
GL	Ground Level
GOJ	Government of Japan
GWL	Ground Water Level
GVA	Gross Value Added
H	Height
HCMC	Health Center Management Committee
HWL	High Water Level
ICP	Inductively Coupled Plasma
ID	Inner Diameter
IDA	International Development Association (The World Bank Group)
IEE	Initial Environment Examinations
IO	International Organizations
IPM	Integrated Pest Management
ISO	International Standards Organization
It/R	Interim Report
IWDA	International Women's Development Agency
JICA	Japan International Cooperation Agency
JIS	Japanese Industrial Standard
JWWA	Japan Waterworks Association
L	Length
LAN	Local Area Network
LDC	Least Developed Countries
LPG	Liquefied Petroleum Gas
L.S.	Lump Sum
LWL	Low Water Level
M	Meter
MDS	Meter District System
MIME	Ministry of Industry, Mines and Energy

MOA	Ministry of Agriculture, Forest and Fisheries
MOEF	Ministry of Economy and Finance
MOH	Ministry of Health
MOP	Ministry of Planning
MOT	Ministry of Tourism
M/P	Master Plan
MPA	Minimum Package of Activities
MPN	Most Probable Number
MSL	Mean Sea Level
NGO	Non-government Organization
NPV	Net Present Value
NTU	Nephelometric Turbidity Unit
O&M	Operation and Maintenance
OD	Outer Diameter
ODA	Official Development Assistance
PBML	Provincial Budget Management Law
PDIME	Provincial Department of Industry, Mines and Energy
PE	Poly Ethylene pipe
PPWSA	Phnom Penh Water Supply Authority
PSP	Private Sector Participation
PVC	Poly Vinyl Chloride (pipe)
Q	Quantity, Flow
RC	Reinforced Concrete
RGC	Royal Government of Cambodia
SCNC	Supreme Council for Natural Culture
S/O	Simulation and Optimization
SP	Steel Pipe
SS	Suspended Solid
SWL	Static Water Level
TDS	Total Dissolved Solid
THM	Tri Halo Methane
UFW	Unaccounted For Water
UK	United Kingdom
UNDP	United Nations Development Program

UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFPA	United Nations Population Fund
UNICEF	United Nations Children Fund
UNO	United Nations Organization
UNTAC	United Nations Transition Authority for Cambodia
UNV	United Nations Volunteer
USA	United States of America
US\$	US Dollar
VIP	Ventilated Improved Pit
VLf	Very Low Frequency
W	Width
WAC	Women's Association of Cambodia
WB	World Bank
WES	Water and Environmental Sanitation
WFP	World Food Program
WHO	World Health Organization
WID	Women In Development
ZEMP	Zoning and Environment Management Plan (prepared by UNESCO)
	Diameter

MEASUREMENT UNITS

Extent

cm ²	=	Square centimeters (1.0 cm x 1.0 cm)
m ²	=	Square meters (1.0 m x 1.0 m)
km ²	=	Square kilometers (1.0 km x 1.0 km)
ha	=	Hectares (10,000 m ²)

Volume

cm ³	=	Cubic centimeters (1.0 cm x 1.0 cm x 1.0 cm)
m ³	=	Cubic meters (1.0 m x 1.0 m x 1.0 m)
m ³ /day	=	Cubic meters per day
m ³ /h	=	Cubic meters per hour
m ³ /min	=	Cubic meters per minute
m ³ /s	=	Cubic meters per second
l or lit	=	Liter (1,000 cm ³)
lpcd	=	Liter per capita per day

Length

mm	=	Millimeters
cm	=	Centimeters (cm = 10 mm)
m	=	Meters (m = 100 cm)
km	=	Kilometers (km = 1,000 m)

Weight

g	=	Grams
mg	=	Milligrams (1/1,000 g)
mg/l	=	Milligrams per liter
μg/l	=	Micrograms per liter
kg	=	Kilograms (1,000 g)
kg/cm ²	=	Kilograms per square centimeter
t	=	Metric ton (1,000 kg)

Currency

US\$	=	United State Dollars
		US\$1.0 = J¥120 = R 3,800
J¥	=	Japanese Yen
R	=	Cambodian Riels

Time

s	=	Seconds
min.	=	Minutes (60 s)
h	=	Hours (60 min.)

Energy

kVA	=	Kilovolt Ampere
kW	=	Kilowatt

Others

per/km ²	=	Persons per square kilometer
S/m	=	Siemens per meter
μS/m	=	Micro siemens per meter