

The Turn Around of PPWSA

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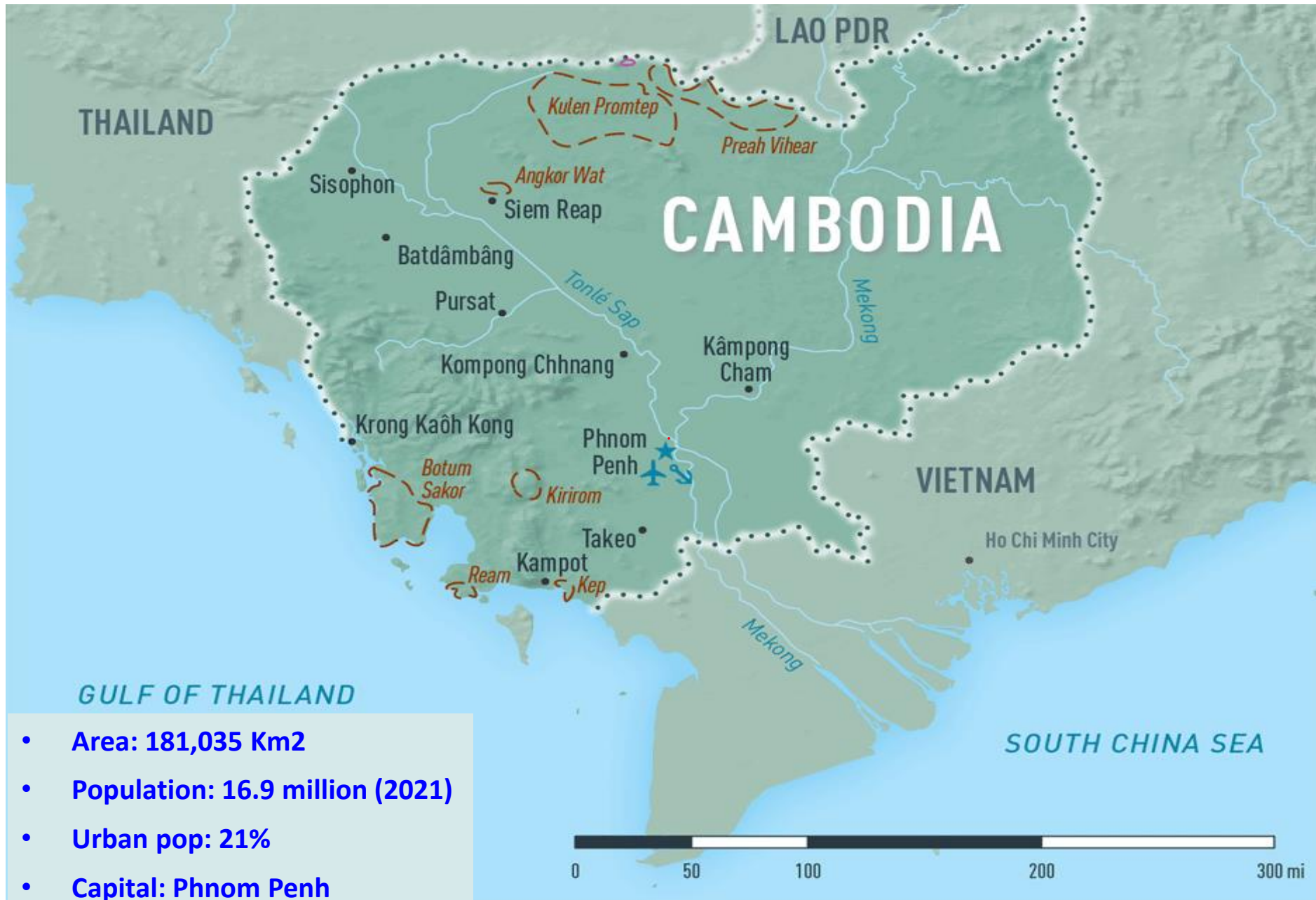
A. General Information



Angkor Wat Temples (802)

- . **7 World Wonder**
- . **2.6 M Visitors/year**
- . **Build date: Early 12 Century**
- . **Builder: Emperor Surya Varman II**
- . **Location: Northern of Cambodia**

KINGDOM OF CAMBODIA

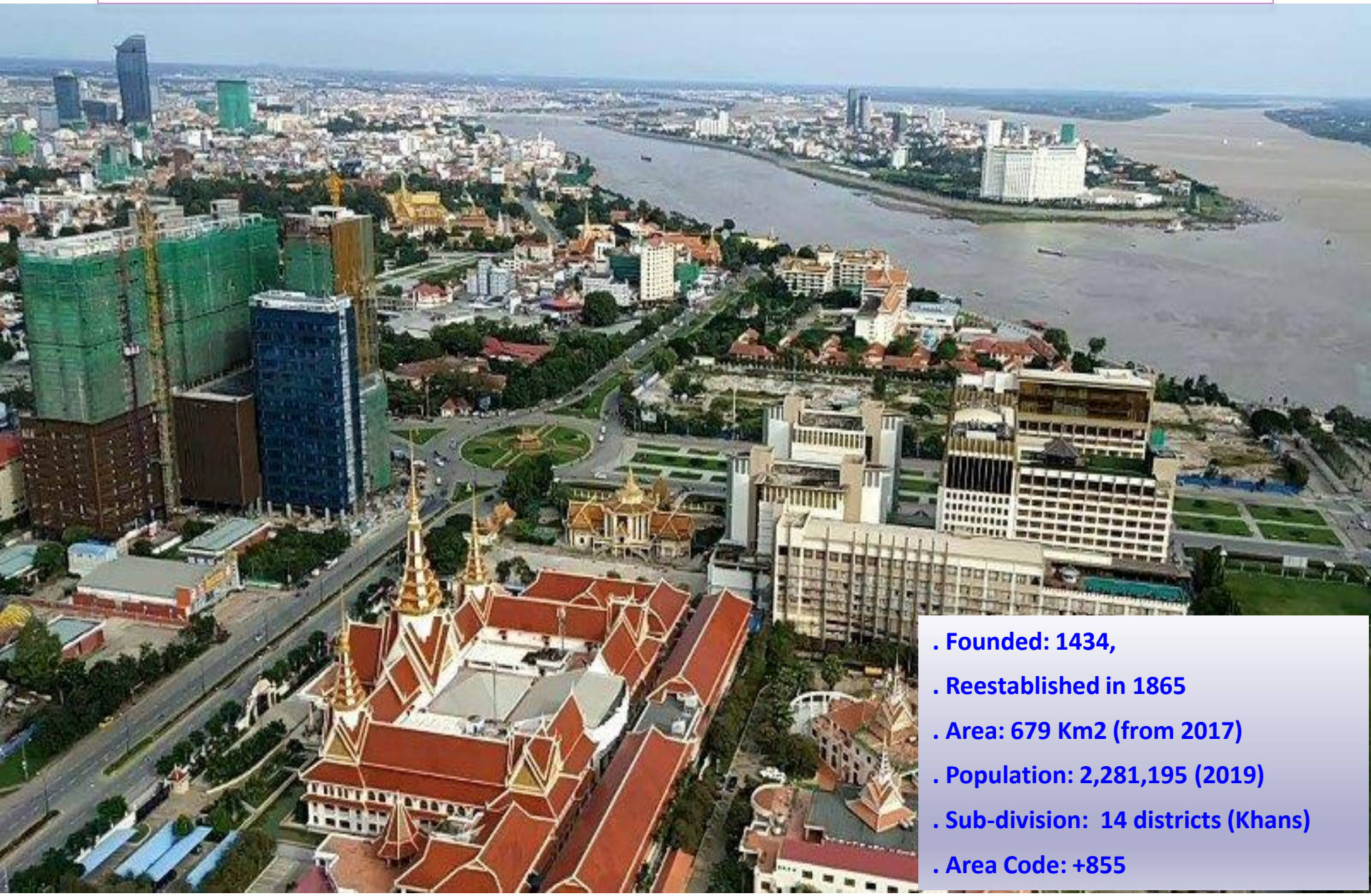


GULF OF THAILAND

- Area: 181,035 Km2
- Population: 16.9 million (2021)
- Urban pop: 21%
- Capital: Phnom Penh

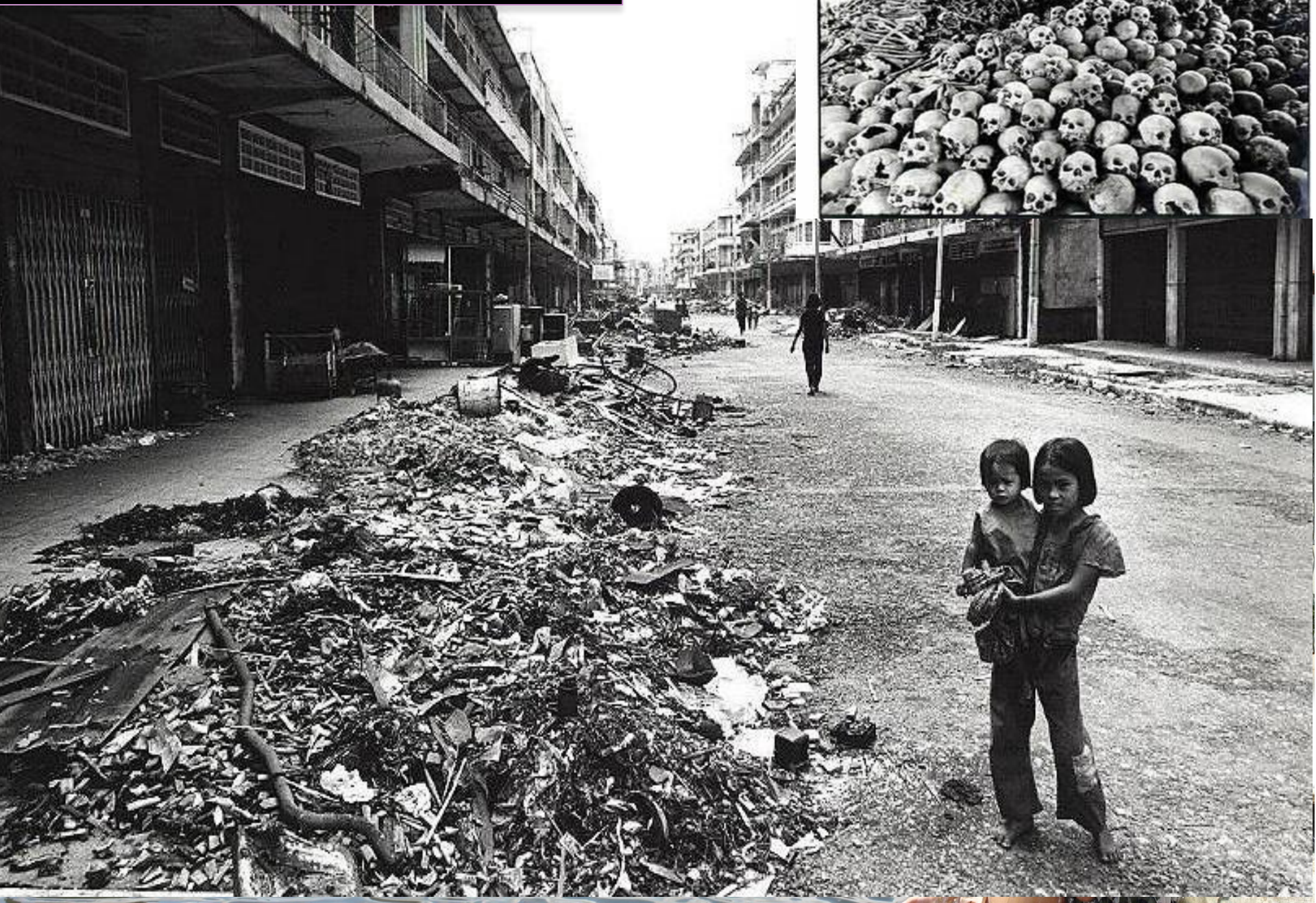
SOUTH CHINA SEA

PHNOM PENH Capital Of Cambodia



- . **Founded: 1434,**
- . **Reestablished in 1865**
- . **Area: 679 Km2 (from 2017)**
- . **Population: 2,281,195 (2019)**
- . **Sub-division: 14 districts (Khans)**
- . **Area Code: +855**

The Killing Field (1975-1979)



A ROUGH START

PHNOM PENH WATER SUPPLY AUTHORITY

- ❖ ***PPWSA was destroyed by the civil war in Cambodia in the 1970s; it had to be completely rebuilt.***
- ❖ ***Our rebuilding philosophy was focused on Efficiency – we had to be efficient in all aspects of our operations.***
- ❖ ***We began work in 1993 with help from different DP (Japan, France, ADB and the World Bank)***

PPWSA 9a 1993



First Water Treatment Plan In Cambodia.(1895-1987).

Hystoric Pictures Taken in 1993



1rst WTP (1895-1987)



Water Connections(1993-1998)



Just No Choice (1993-2001)

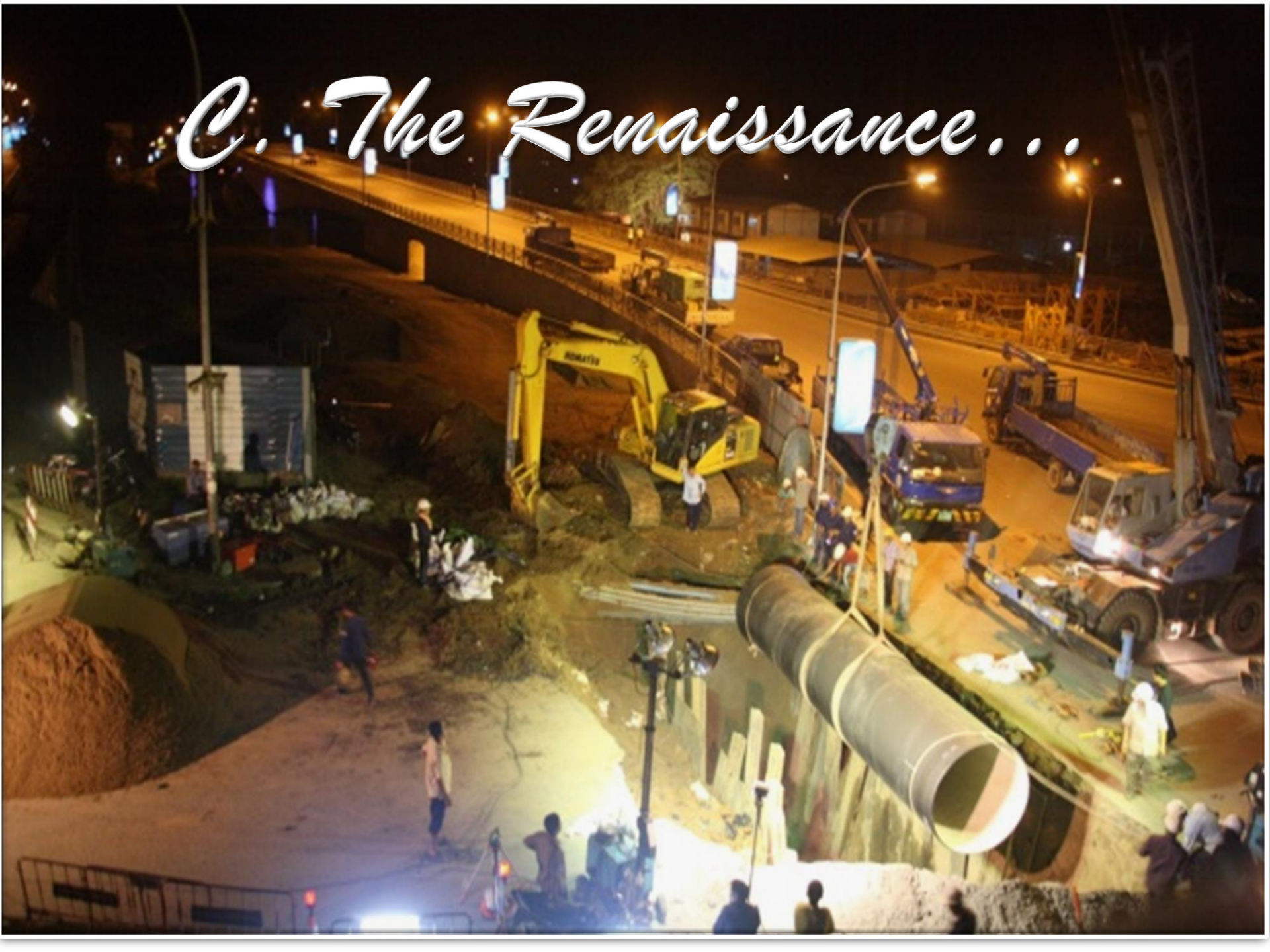


Public Water Reservoir (1993 -1996)

PPWSA's Situation In Numbers...

Scope	Statistic Number
Production	65.000m ³ /day
Distribution Network	288 km
Coverage	40% of City area
Served Population	25% of PNH habitant
Supply Duration	10hr/day
Customer Base	25,960 Connections
Collection Ratio	48%
Water Losses	72%
Numb. Of Staff per 1000 Con.	20
Staff's Salary	Below 1usd/day
Financial Status	Heavily deficit

C. The Renaissance...



Enable Environments

❖ 23 May 1993: First General Election Day

- New Government Has Been Formed-up After General Election Assisted by UNTAC. (Paris Peace Agreement 23/10/1991).
- This Government Is Eligible to External Assistances.

❖ International Communities:

- Opportunity For Financial & Technical Support For the Reconstruction of the utility.

❖ September 1993: Nomination Of a New Leader

- Opportunity For Change: New Vision, New Mission, New Hope...

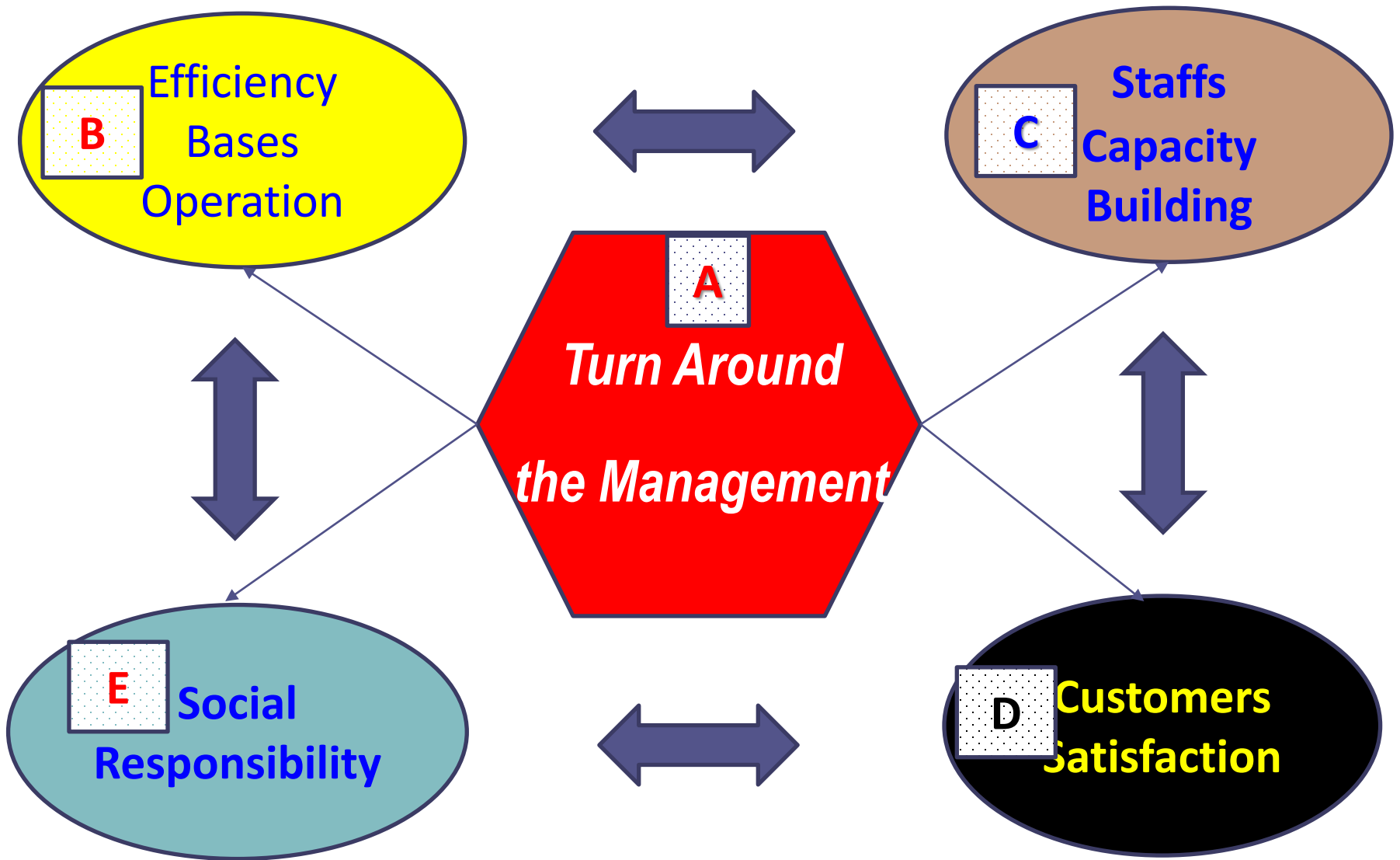


DP's Financial Assistances In Number (2012)

Development Partners	UNIT	AMOUNT	STATUS
UNDP (WB)	USD	2,803,001	Grant Aid
JAPAN (2 Delopment Studies & 4 Projects)	YEN	8,608,000,000	Grant Aid
		3,513,000,000	Loan
FRANCE (2 Studies & 3 Projects)	FRF	79,200,000	Grant Aid
	USD	100,000	Grant Aid
	EUR	4,513,000	Grant Aid
	EUR	11,100,000	Loan
	EUR	16,000,000	Loan
WORLD BANK (2 Projects) (1998)	USD	28,654,895	Loan (Paid)
	SDR	550,000	Grant Aid
ADB (1 Project) (1996)	USD	12,638,749	Loan (Paid)
Total (by 2011)	USD	About USD 260 millions	

consists of about USD158 Million Grant and USD102 Million Loan

Our Agenda For Survival



A-Turn Around the Management

❖ A-1: Restructure the Management:

- Young, Dynamic, Educated & Enthusiastic Staffs to Send to the Front Line.*
- Inactive Old Managers Keep Their Position, But Move Into Dormant Roles.*
- The Higher Your Position, The better behave You Must...*
- Unity Is the Drive Force Of Success!!!*

A-Turn Around the Management

❖ *A-2: Change of Culture:*

- *Model From The Top*
- *No One Is Above The Rule*
- *Good Intention & Good Result, Get Reward.*
- *Team Work Spirit: “One for All & All for One”.*



Three Musketeers

A-Turn Around the Management

- ❖ ***A-3: Commitment From The Management***
 - ***Collective Discussion & Decision***
 - ***Strict & Hard Measure Against Corruption***
 - ***Selection Base On Quality & Result Of Works***
 - ***Promotion Must Go Through A Strict Screening Process.***

B-Efficient Base Operation

1) Improve Water Bill Collection

❖ B-1-1: Update the Customer-File

➤ ***Out of 25,960 recorded customers, there are 12,980 Without Water Connection, But Water Bill, whereas 13,901 real customers were never been recorded & Billed.***

➤ ***1994: Completed a new customer-file with 26,881 real customers.***



Customer Survey (1994)

B-Efficient Base Operation

1) Improve Water Bills Collection

❖ B-1-2: Improve Capacity of Every Collector

- Training Every Collector***
- Set up S.O.P. For Water Bill Collection***
- Enforce Strict Discipline***
- Apply Incentive & Penalty.***



B-Efficient Base Operation

1) Improve Water Bill Collection

❖ B-1-3- Water Tariff Revision To Cover The Cost

Category	Domestic		Admin		Commercial	
	Volume (m³/m)	Tariff (R/m³)	(m³/m)	Tariff (R/m³)	(m³/m)	Tariff (R/m³)
Bf 01 Jan 97	-	250	-	-	-	700
After 1 Jan 97 – 1 Jan 01) (Autonomous)	0 – 15	300	-	940	0 – 100	940
	16 – 30	620			101 – 200	1,260
	31 – 100	940			201 – 500	1,580
	>100	1,260			>500	1,900
After 01 Jan 2001	0 – 7	550	-	1,030	0 – 100	950
	8 – 15	770			101 – 200	1,150
	16 – 50	1,010			201 – 500	1,350

B-Efficient Base Operation

2)-Water Losses Reduction

❖ `B-2-1: Properly Repair Water Leaks

- Set-up 24/7 leaks repair scheme: From a single team to four teams*
- From 4 staffs to 16 staffs*
- From no skill to skilled*
- From more than 1 day, to not Later than 1 hour.*
- Apply Incentive & Penalty.*



B-Efficient Base Operation

2)- Water Losses Reduction

❖ B-2-2: Metering Every Connection:

- In 1993: only 3,391 out of 26,881 connections were metered.*
- In 1997: 26,881 Connection Metered*
- In 2001: 74,945 con. were 100% metered with class C meter*



Metering the Connection(1994)

B-Efficient Base Operation

2)- Water Losses Reduction

❖ B-2-3: Fighting Against Illegal Connections

- Internal Educate & Control is Primordial*
- Immediate Reward For Information That Brings to Find-out Illegal Connection*
- Apply Hard Punition To Offender Without Exception*



B-Efficient Base Operation

2)- Water Losses Reduction

❖ B-2-4: Pipes Replacement

- 1994-1996: Replaced of All 280km of Old Cast Iron Pipes To DI & HDPE Pipes.*
- Physical Losses Reduced*
- Allow to Eliminate 1945 Public Water Wells*
- Increase Water Pressure For Better Service.*



B-Efficient Base Operation

2)- Water Losses Reduction

❖ B-2-5: Start-up Water Leaks Investigation

- Set up Water Leaks Investigation Team (From Water Leaks Repair Team)*
- One Year OJT By Experts Before Working With JICA Experts from 2003-2006*
- Many Leaks Were Found Even Most Difficult Water Thefts.*



B-Efficient Base Operation

2)- Water Losses Reduction

❖ B-2-6: Implement The DMA Supported By WB & JICA)

- 2003: Set up 3 Zones As Pilot Zones & OJT by Expert*
- 2005: Phnom Penh metropolitan area divided into 8 district areas, and 42 metered zones. (2011)*
- 2005: Apply SCADA System to address NRW and to optimize energy consumption.*
- By 2006 Our Technical Staffs Become Mentors To Provincial Water Utilities.*

B-Efficient Base Operation

2)- Water Losses Reduction

❖ B-2-7: Internal Service Contract

- 2007: Learning From a Seminar In Kuala Lumpur***
- Hydrise To Our Own Process & Implement By Our Own***
- 2008 Starting One Year Implementation As Pilot In Two Zones***
- 2009: Full Scale Implementation on Every Zones***
- This Scheme Was Evaluated Internally As the Most Effective Scheme In The NRW's Reduction .***

C-Staffs Capacity Building

❖ C-1: Our Principle

- Should be 3 H:
 - *Head: Skill Training: Capacity*
 - *Heart: Good Deed Quality*
 - *Hands: “Action Speaks Louder Than Words”.*



C-Staffs Capacity Building

❖ **C-2: Build The Know-How (The Head)**

- *Quarterly Meeting For Exchange Of Lesson Leant*
- *Year End Examination Of Every Section On Their Expertise's. The Result of This Examination Will Be Considerate For Nomination & Grade Increases.*



C-Staffs Capacity Building

❖ C-3: Build The Quality (The Heart)

- 8 Years Salary Increases:
 - From 1USD/day to The Level of Local market.
- Create Solidarity's Fund:
 - Support Education of Staffs Kids & Family Biz.
- Provide Social Houses:
 - Donation to Best Staff of the Year With Selection.



C-Staffs Capacity Building

❖ C-4: Build Staff Quality (The Hands)

- Quarterly Self-Evaluation Of Each Staffs Base on 3H Concept***
- Selection Of Best Staffs Of Semester & Year***
- Results Of These Evaluations Will Be Considered For Promotion, Grade & Salary Increase Accordingly To PPWSA's Status.***

D- Customer Satisfaction Program

❖ D-1: Transparency:

- Quarterly Disclose Operation Results to the Public.
- Explain To The Public On How The Water Bill is Calculated
- Publicly Display The Detail Cost of Water Connection
- Set-up The Customer Desk To Respond to Customer Concern.



Cost Of Water Connection At Cashier



Customer Desk At Every Cashier

D- Customer Satisfaction Program

❖ D-2: Accountability:

- Provide Pre-Information To The Community & Discuss About Their Water Project.
- Set-up A 24/7 Hot Line To Respond To Customer Calls
- Bring Cashier To Near By Customer Houses
- Online Payment: The First Utility To Introduce Online Payment..



Meeting With Community



Customer Desk At Every
Cashier

E- Social Responsibility Program



Private Water Vender (Sub-urban)



Pipe Installation For Slum Community



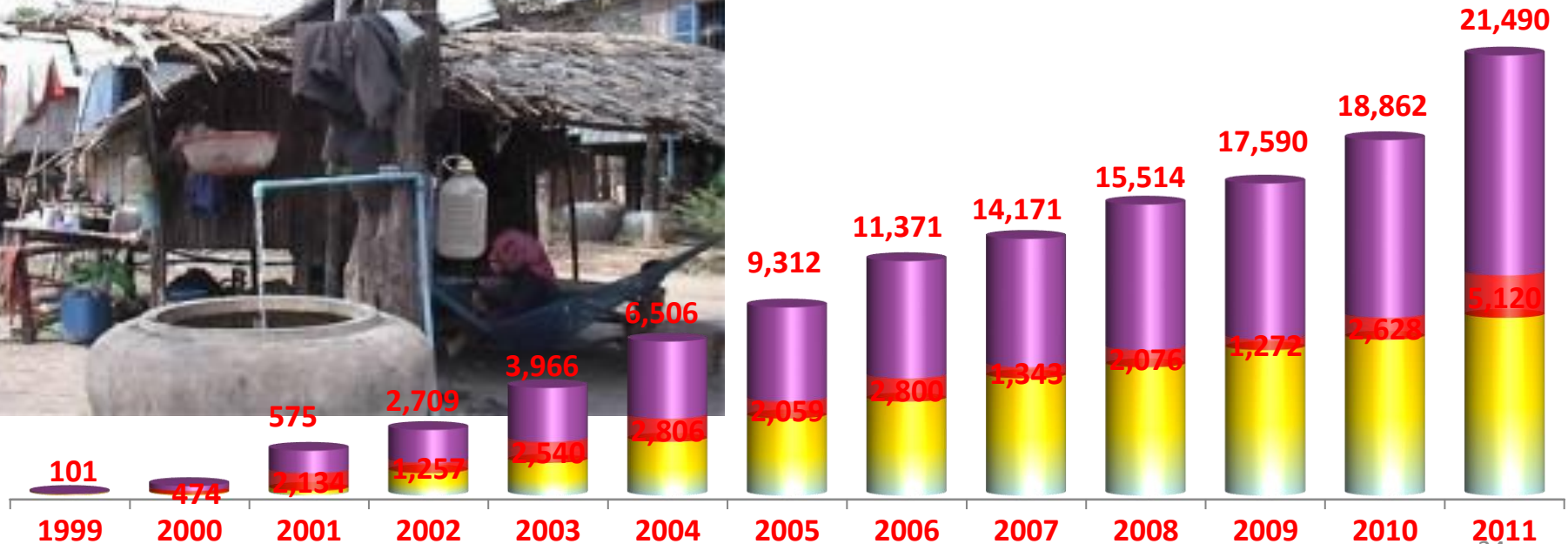
Kids Are Busy to Collect Water For Family



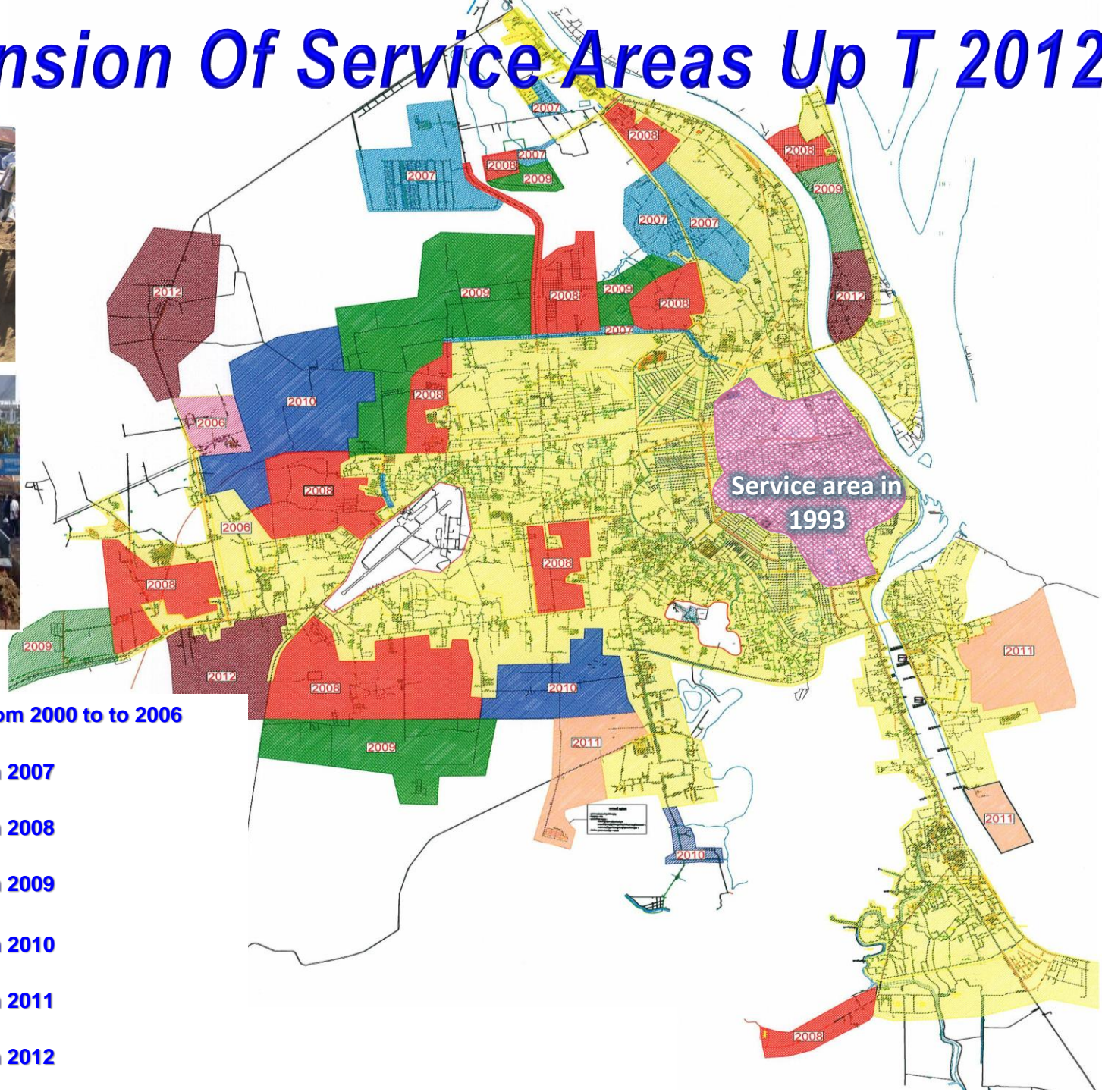
Everyone Has The Same Right To Water

Water For All

- ❖ 1999: Install payment to 10, 15 and 20 months on connection cost (~USD100/connection of 15mm WM).
- ❖ Subsidy 30%, 50%, 70% & 100% on connection cost.
- ❖ Benefit: Social, Gender, Kids Education, Economic & Health.



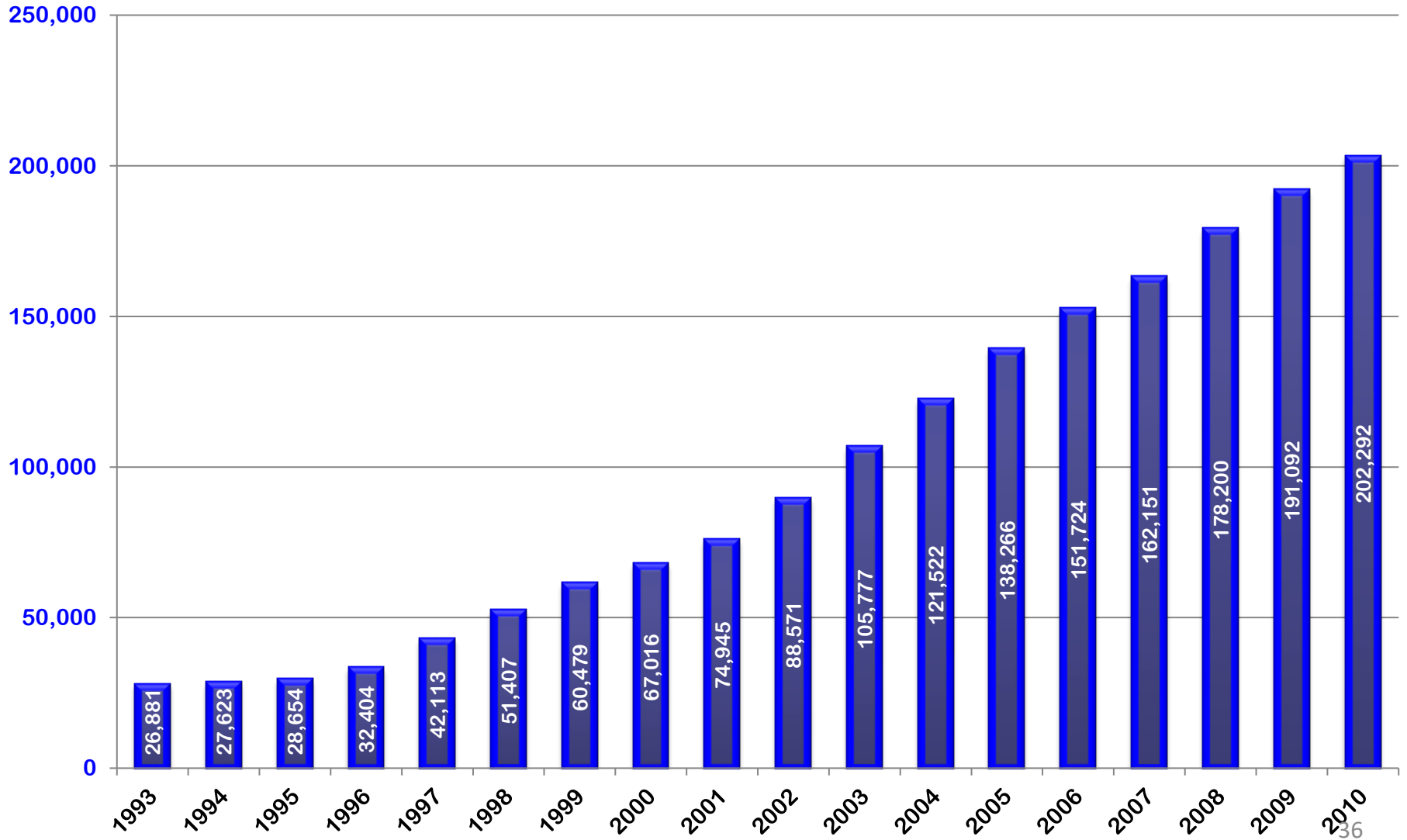
Expansion Of Service Areas Up T 2012



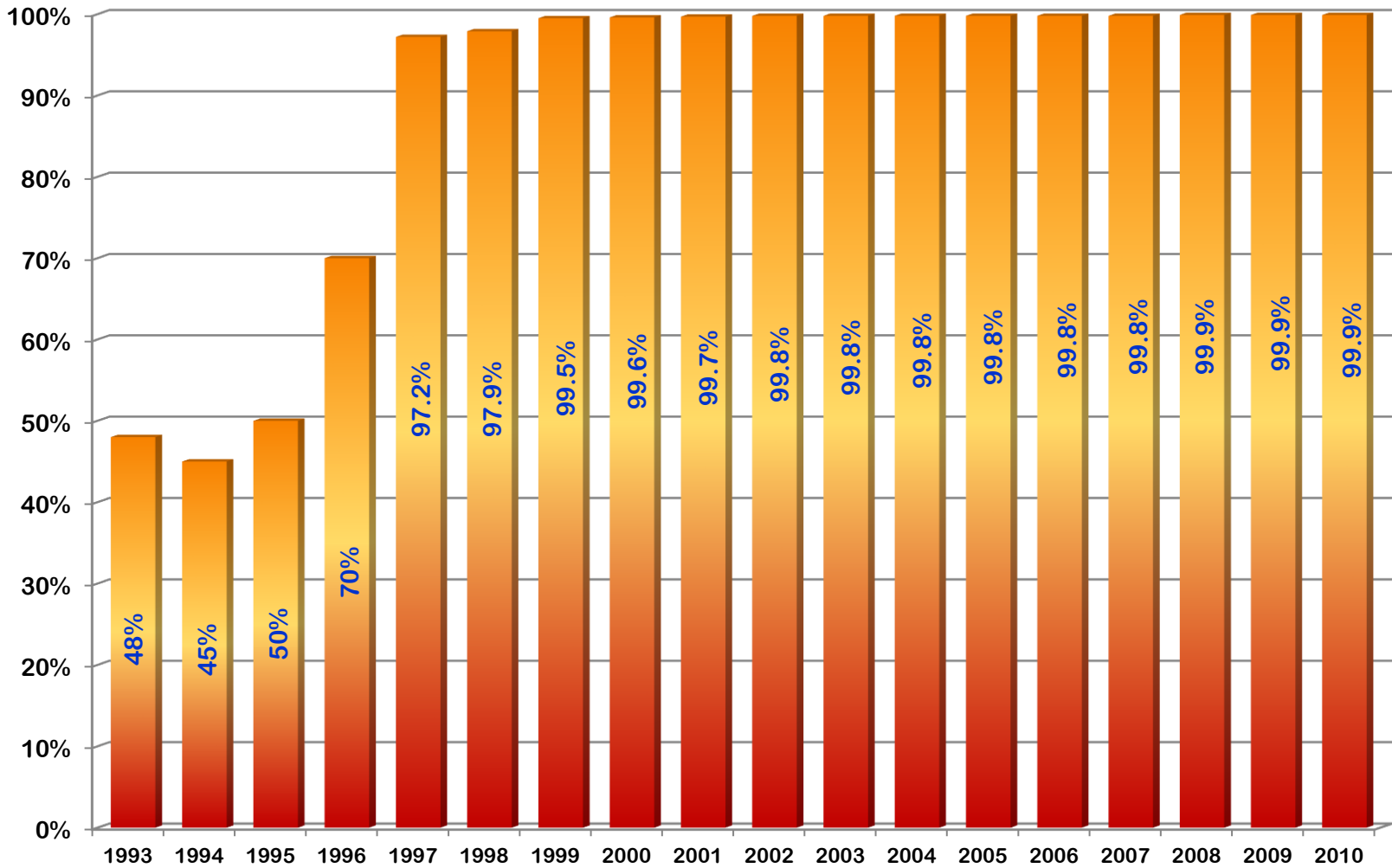
Note:

- Expansion area from 2000 to to 2006
- Expansion areas in 2007
- Expansion areas in 2008
- Expansion areas in 2009
- Expansion areas in 2010
- Expansion areas in 2011
- Expansion areas in 2012

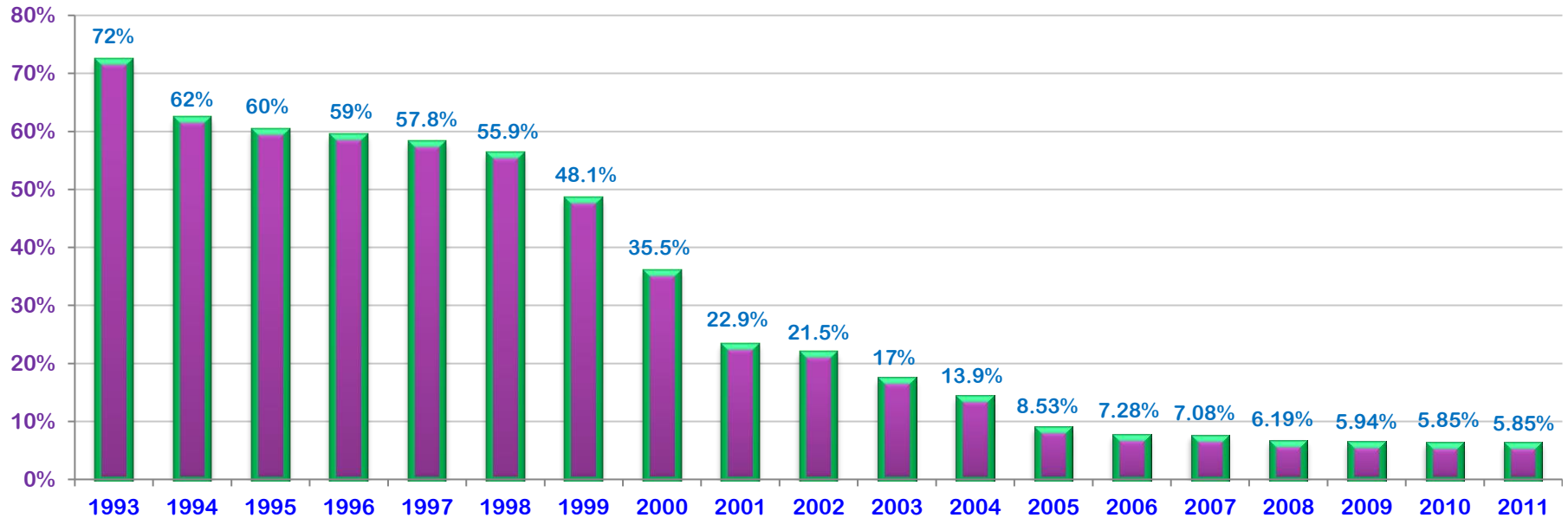
From 25% To 90% Resident Connected



Water Bill's Collection at 99.9%



NRW Reduced From 72% to less than 6%



❖ This NRW reduction is **equal to a saving of about USD 116 millions on investment, and USD 18 millions of income per year.**

❖ **The above figures is shown by this below calculation::**

↪ **72 – 6 = 66% of water produced was saved,**

↪ **As of 2011, production was 300,000m³/day; this 66% is equivalent to 198,000m³/day.**

↪ **As of PPWSA average tariff is USD0.25/m³; this 198,000m³/day represents an amount of : USD18,067,500/year.**

↪ **To supply the amount of water lost 198Km³, we need to build a WTP of 198,000/34% = 580Km³.**

↪ **If The investment Cost of WTP is \$200/m³, The investment Cost for This WTP is USD 116M..**

Our Water is Safe to Drink Since 2006

TEST REPORT: S07CHM00283-JL

Date: 18 JAN 2008

Tel: +65 68851303 Fax: +65 67784301

Client's Ref: -

Email: Xinping.HOU@tuv-sud-psb.sg

Note: This report is issued subject to TÜV SÜD PSB's "Terms and Conditions Governing Technical Services". The terms and conditions governing the issue of this report are set out as attached within this report.



SUBJECT

Analysis of Water

CLIENT

Cambodia Beverage Company Ltd
National Road 5, No. 287 Phum Mittepheap
Russey Keo, Phnom Penh
Kingdom of Cambodia

Attn: Mr Song Kheng Lean

SAMPLE SUBMISSION DATE

17 Dec 2007

DESCRIPTION OF SAMPLE

2 x 4L of Raw Water sample (from Municipal Water).

METHOD OF TEST

1. Analysis by Gas Chromatography – Mass Selective Detector (GC-MSD)
2. Analysis by Gas Chromatography – Nitrogen Phosphorous Detector (GC-NPD)
3. Analysis by Gas Chromatography– Electron Capture Detector (GC-ECD)
4. Analysis by Liquid Chromatography - Mass Spectrometry (LC/MS/MS)
5. Inductively Coupled Plasma Mass Spectrometer (ICP-MS)
6. Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES)
7. Ion Chromatography (IC)

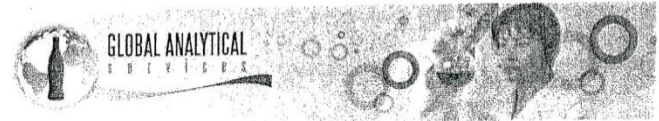
Result of PPWSA's Water Quality Analysis by Singapore's lab in 2007 on 102 parameters



Laboratory:
TÜV SÜD PSB Pte. Ltd.
Testing Group
No.1 Science Park Drive
Singapore 118221

Phone : +65-6885 1333
Fax : +65-6776 8670
E-mail: testmg@tuv-sud-psb.sg
www.tuv-sud-psb.sg
Co. Reg : 196002667R

Regional Head Office:
TÜV SÜD Asia Pacific Pte. Ltd.
3 Science Park Drive
#04-01/05 The Franklin
Singapore 118223



Details:

Number: 200903-R/0604
Sample Type: Raw Water - Process Water
Water Source: City
Sampling Point: Brand:

Sampling Date: Jun-08-2009
Reception Date: Jun-15-2009
Completion Date: Jun-23-2009

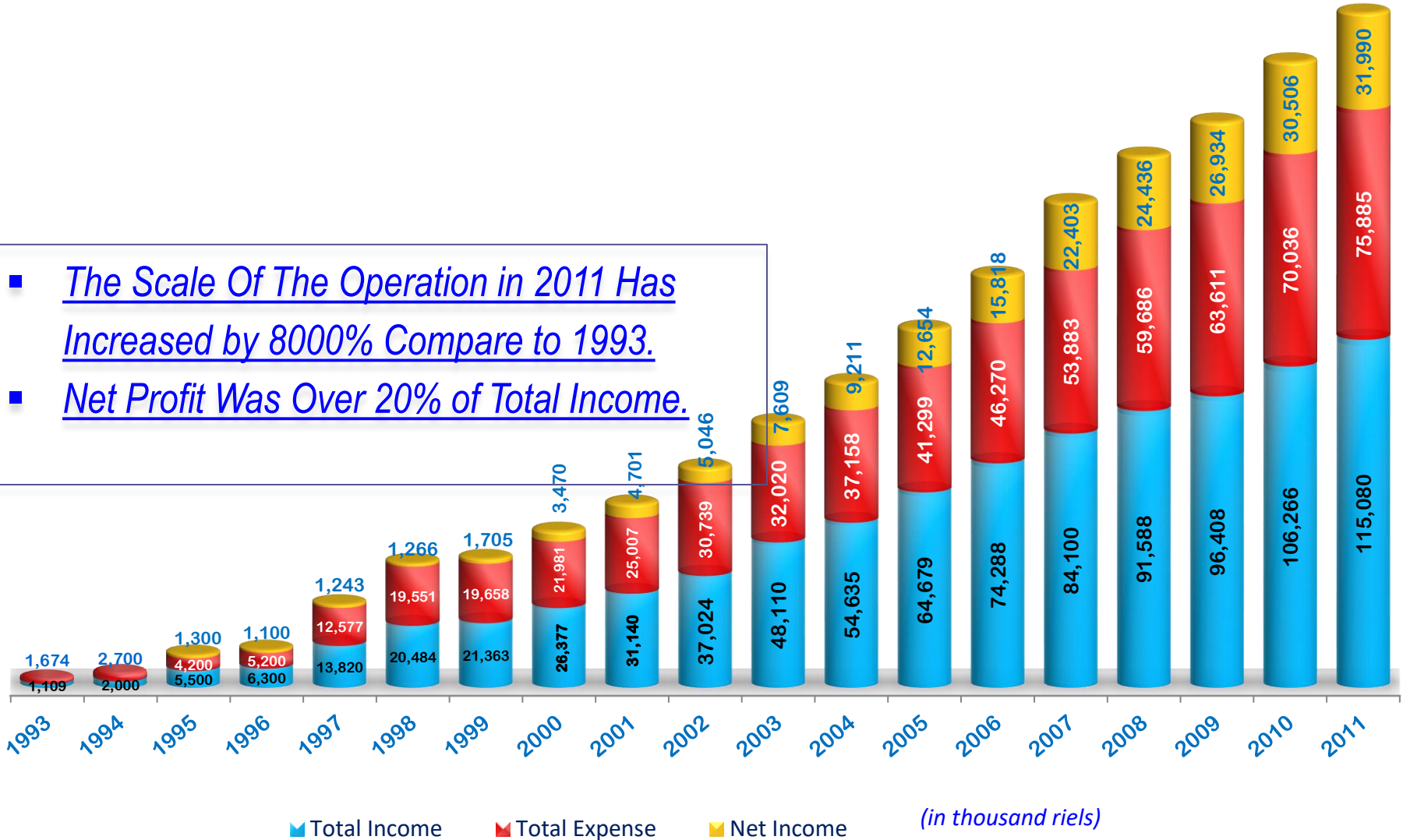
Results:

	Unit	BO-SP-240
Microbiology		
Total Count	< 1	CFU/1 ml < 25 CFU/1 ml
Total Coliforms	< 1	CFU/100ml < 1 CFU/100 ml
Process Performance		
Appearance	No Visible Color	No Visible Color
Chlorine, Total as Cl ₂	< 0.05 mg/l	0.0 mg/l
Odour	No off Odor	No off Odor
Total Dissolved Solids	95.3 mg/l	<500 mg/l
Turbidity	0.23 NTU	<0.5 NTU
pH	7.22	> 4.9
Inorganics		
Aluminium, Total as Al	40.0 µg/l	<200 µg/l
Antimony, Total as Sb	< 1 µg/l	<10 µg/l
Arsenic, Total as As	< 1 µg/l	<10 µg/l
Barium, Total as Ba	36.9 µg/l	<700 µg/l
Beryllium, Total as Be	< 0.1 µg/l	<1 µg/l
Boron, Total as B	8.8 µg/l	<10 µg/l
Bromide as Br	< 5 µg/l	<10 µg/l
Cadmium, Total as Cd	< 0.1 µg/l	<3 µg/l
Chloride as Cl	19.0 mg/l	<250 mg/l
Chromium, Total as Cr	< 10 µg/l	<2000 µg/l
Copper, Total as Cu	< 20 µg/l	<70 µg/l
Cyanide, Total as CN	< 0.1 µg/l	<1500 µg/l
Fluoride as F	0.5 µg/l	<10 µg/l
Iron, Total as Fe	0.3 µg/l	<10 µg/l
Lead, Total as Pb	< 0.1 µg/l	<10 µg/l
Manganese, Total as Mn	0.3 µg/l	<400 µg/l
Mercury, Total as Hg	< 0.1 µg/l	<1 µg/l
Molybdenum, Total as Mo	< 1 µg/l	<10 µg/l
Nickel, Total as Ni	< 1 µg/l	<20 µg/l
Nitrate as NO ₃	1.28 mg/l	<50 mg/l
Nitrite as NO ₂	< 0.002 mg/l	<0.2 mg/l
Selenium, Total as Se	< 1 µg/l	<10 µg/l
Silver, Total as Ag	< 1 µg/l	<100 µg/l
Sodium, Total as Na	7.9 mg/l	<100 mg/l
Sulphate as SO ₄	18.9 mg/l	<250 mg/l

Result of PPWSA's Water Quality Analysis by Shanghai's lab in 2009 on 215 parameters

PPWSA is Financially Healthy Since 2006

- The Scale Of The Operation in 2011 Has Increased by 8000% Compare to 1993.
- Net Profit Was Over 20% of Total Income.



THE TURN AROUND (1993 To 2012)

No	1993	Indicators	2011
1	65,000	Production (m3/day)	430,000
2	288	Distribution Network (km)	2,000
3	40%	Coverage (Phnom Penh Area)	90%
4	25%	Population Served	95%
5	10	Supply duration (h/day)	24/7
6	25,960	Customer base	202,292
7	48%	Water Bill Collection ratio	99.9%
8	72%	Non Revenue Water	5.85%
9	20	Staff per 1000 connection	2.70
10	~ 1usd/day	Salary of The Staffs	market level
11	Below cost	Water Tariff	Affordable
12	Bankrupt	Financial status	Full Cost

Our Lessons Learnt

1. Political will is Crucial:

❖ *Appropriate policy:*

- *Separation Between Policy Maker & Operator,*
- *Utility Must be Accountable As Corporate Governance.*

2. Support From D.P. Is A Necessary Factor:

❖ *To Have Sufficient & Effective Support in Timely Manner.*

3. Internal Dedication Is The Decided Factor:

- ❖ *To Have The Right Leader Is Key,*
- ❖ *To Have The Task Force With 3H.*



“God helps those who help themselves”

THANK YOU!