

# **CAMBODIA BASELINE ASSESSMENT PERSPECTIVE**

## **REGIONAL WORKSHOP ON SEA BASELINE ASSESSMENT**

PHNOM PENH HOTEL, 27-28 JANUARY 2010

Mekong River Commission – SEA of hydropower on  
the mainstream Mekong River

# Outlines

- 1. The country setting and its current CMDGs status**
- 2. Present the process of baseline data collection from the Stung Treng and Kratie**
- 3. Summary key issues: current and future trends for energy, fisheries, and livelihoods as selected sample.**
- 4. Conclusions: fisheries (ecosystem,**

# I. The Country Setting and CMDGs



|   |                        |
|---|------------------------|
| Number of Provinces                     | 24                     |
| Number of Districts                     | 185                    |
| Number of Communes                      | 1,621                  |
| Number of Villages                      | 14,073                 |
| Population of Cambodia Both Sexes       | 13,388,910             |
| Males                                   | 6,495,512              |
| Females                                 | 6,893,398              |
| Percentage of Urban Population          | 19.5                   |
| Annual Population Growth Rate (percent) | 1.54                   |
| Density of Population                   | 75 per Km <sup>2</sup> |
| Sex Ratio (males per 100 females)       | 94.2                   |
| Average Size of Household               | 4.7                    |

Source: "General Population Census of Cambodia 2008 - Provisional Population Totals", NIS, August, 2008

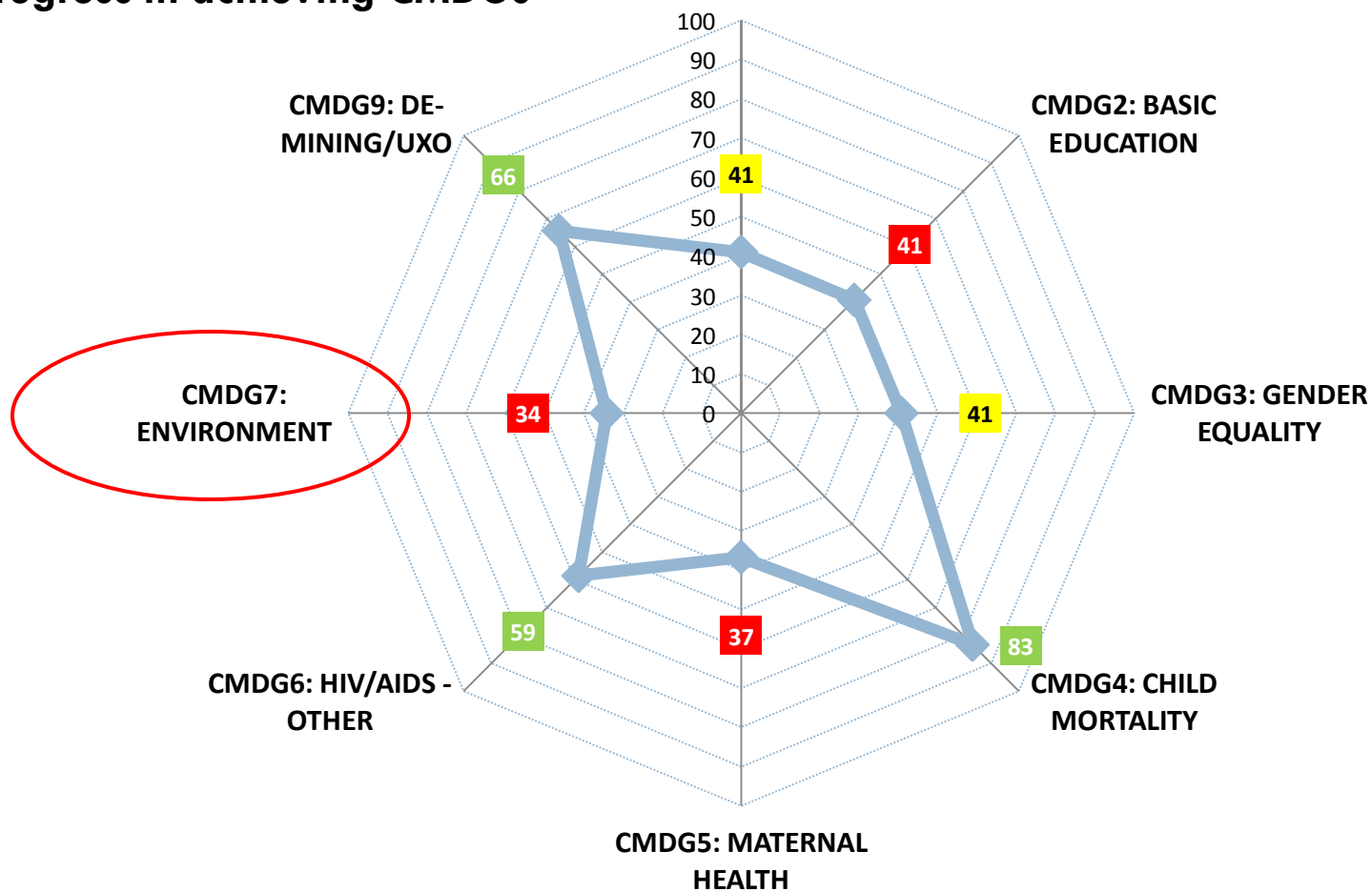
# CMDGs current status



CMDG1:

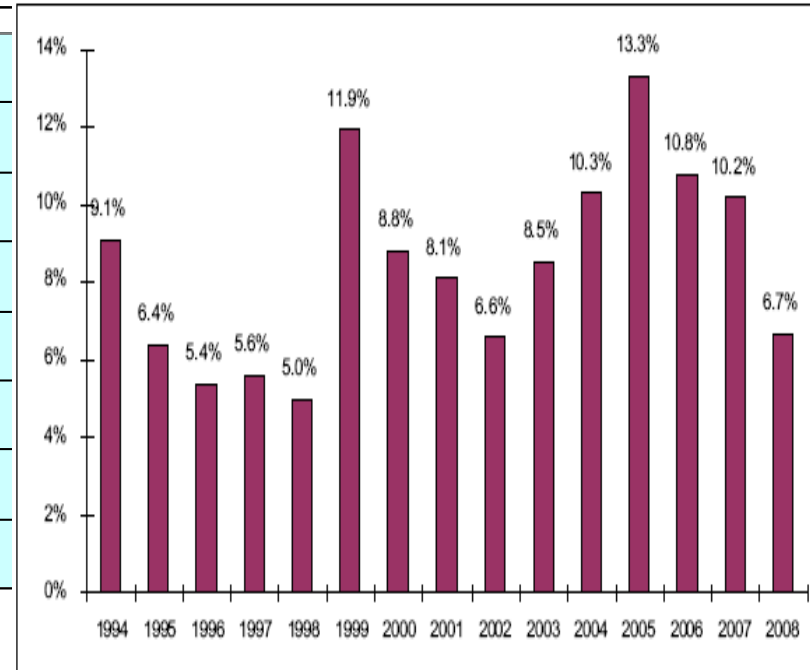
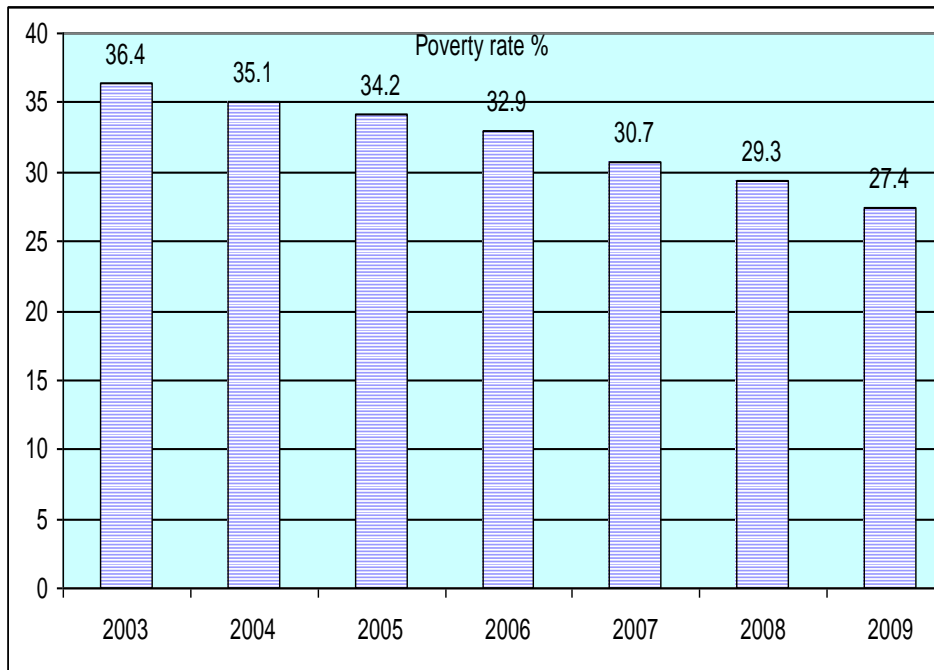
POVERTY/HUNGER

Progress in achieving CMDGs



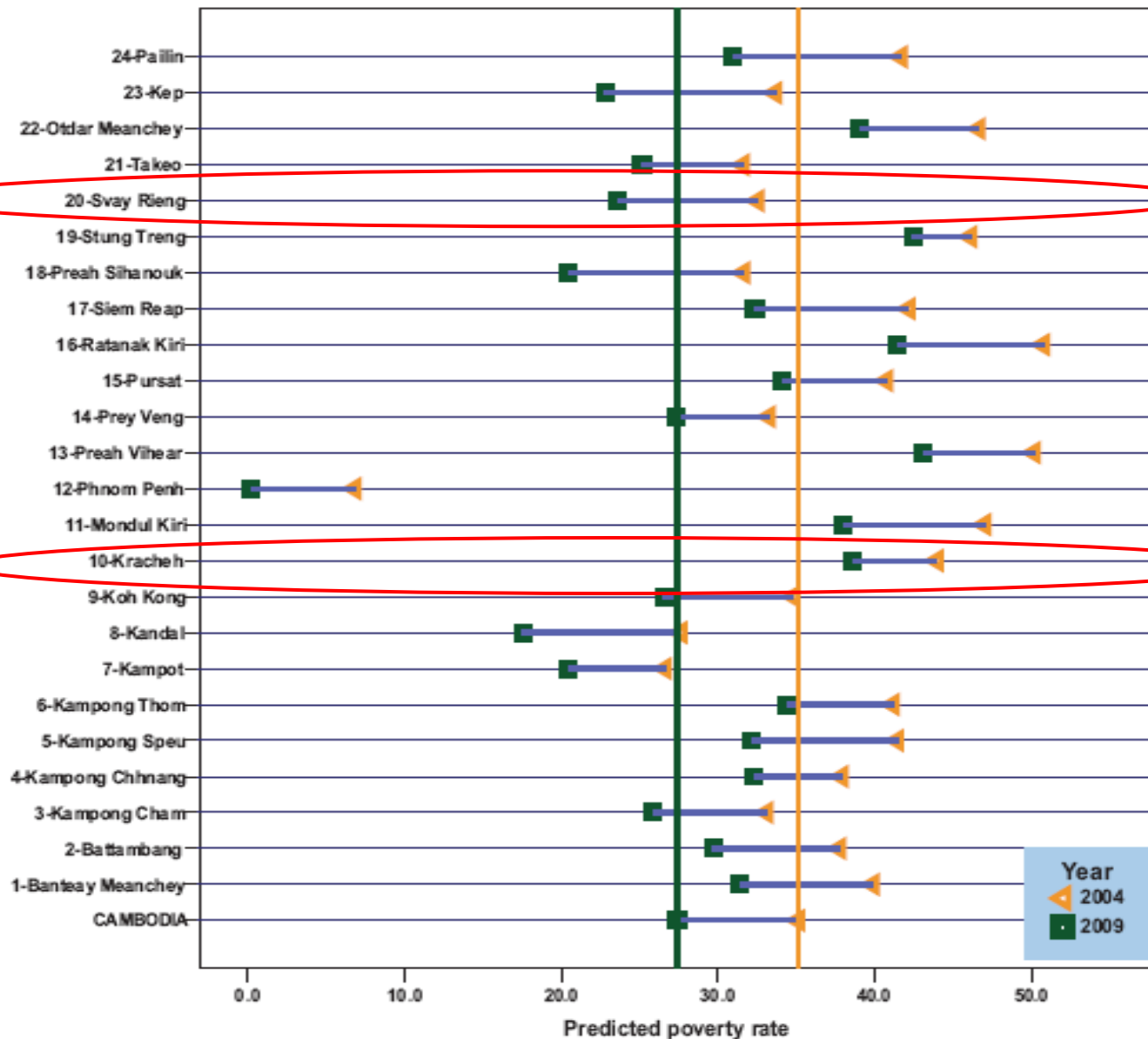
# Poverty at National Level

Overall Poverty has decreased in comparing the national goal of decreasing the proportion of people whose income is less than the national poverty line from 39% in 1993 to 19.5 in 2015.



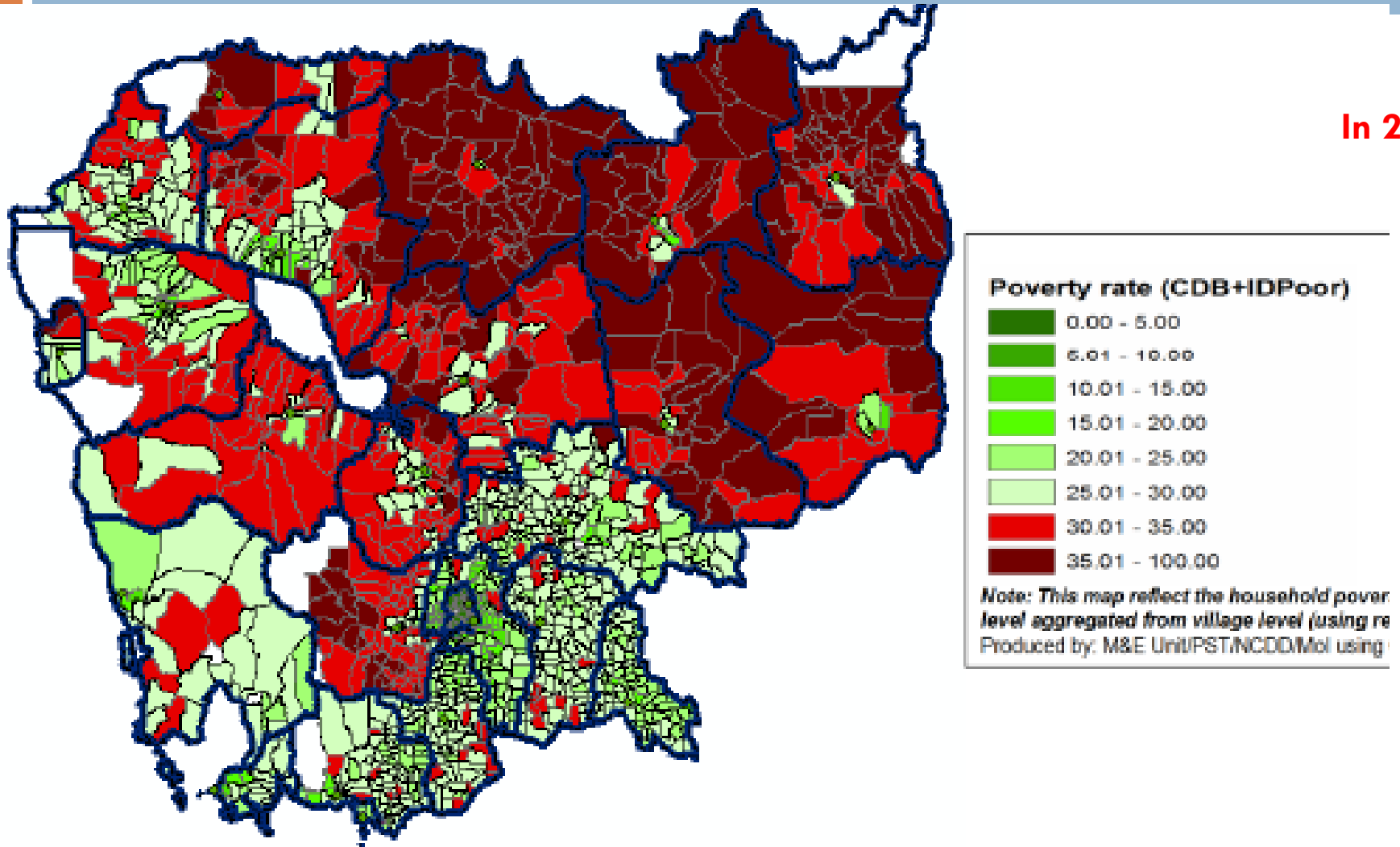
NCDD/MoP (2009) shows poverty has reduced from 35.1% in 2004 down to 27.4% in 2009.

# Poverty at Provincial Level



# Poverty Map: 2004-2009

In 2009



## II. The Baseline of Provinces in Proposed Mainstream Hydropower

### **Documents collected and consulted**

#### **- Stung Treng:**

25 relevant reports: environment, ELC, mining, agriculture, forestry, fisheries, health, proposed development project in Triangle Development Plan, provincial and district profile 2009, irrigation scheme, draft three year investment planning 2010-2013.

#### **-Kratie:**

17 relevant documents: fisheries, agriculture, provincial and district profiles, annual provincial report, strategic development plan, irrigation, ELC, social land concession.

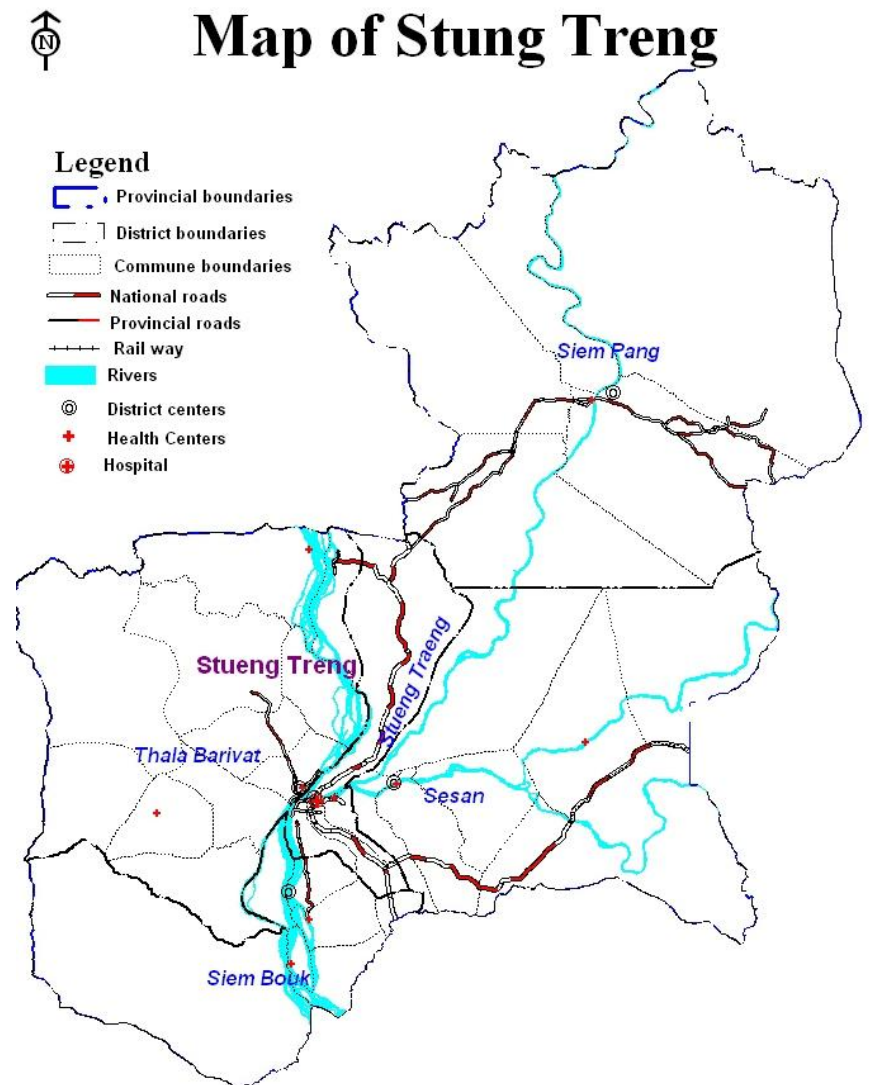


## II. The Baseline of Provinces in Proposed Mainstream Hydropower

People consulted and met:

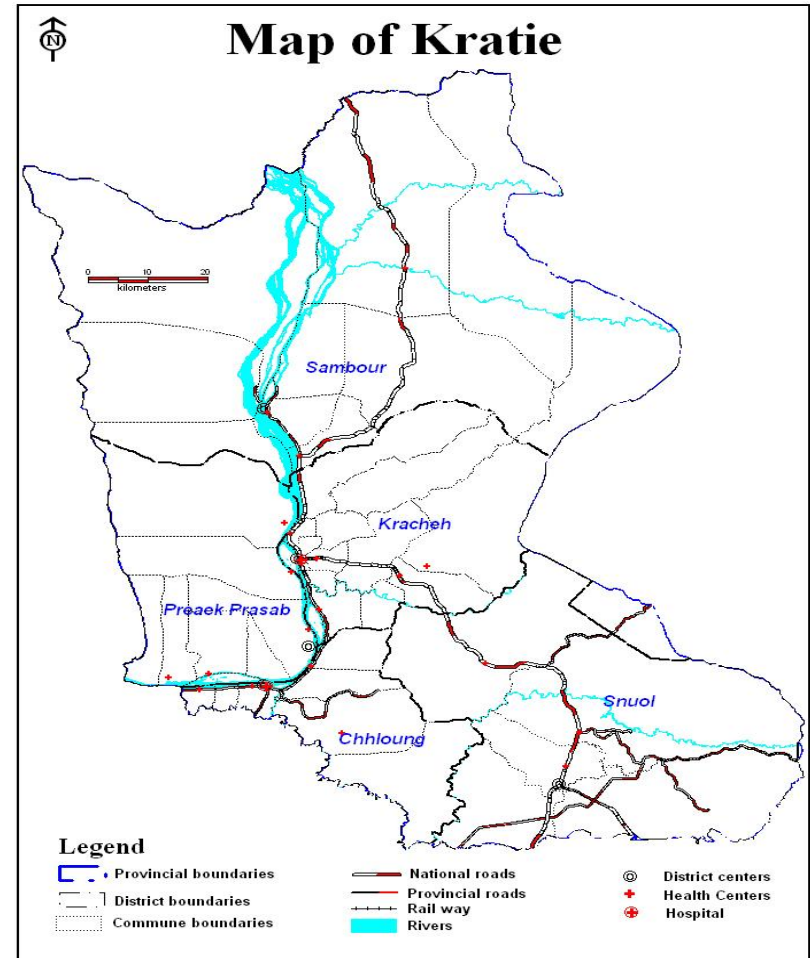
### Stung Treng:

- 10 key informants of line agencies and local authorities
- Discussion themes: forestry, agriculture, fisheries, environment, planning, water resources, and PSDD.



## Kratie:

- 10 key informants line agencies and local authorities
- Discussion theme: fishery, environment, planning, water resource, district authorizes and chief of provincial cabinet



# Population

| Province    | Families | Population | Density/km2 |
|-------------|----------|------------|-------------|
| Stung Treng | 21,204   | 111,671    | 10          |
| Kratie      | 64,060   | 318,813    | 29          |
| Cambodia    |          | 13,700,000 | 75          |

Population density of both provinces is lower than national population density  
between 2 to 7 times.

# Key Issues Identified

## by the Additional Baseline Field Work

- Most effected people from the proposed dams are not aware, informed or consulted;
- **Draft land use planning** in each district. The land use planning does not include the proposed hydropower.
- **Flooded over villages:** The informants have not been informed about scope and potential impact from the proposed hydropower dam.
- **Fisheries:** under estimated including aquatic resources
- **Ethnic groups in the two provinces**
  - ▣ Stung Treng: 10 ethnic minority groups (9,093 peoples)
  - ▣ Kratie: 7 ethnic minority groups (36,476 peoples)
- **Resettlement:**
  - ▣ Kratie ( Sambor and kratie): 140,610 peoples in 2009
  - ▣ Stung Treng (Stung Treng and Thalaboriwat): 61,398 people in 2009

# III. Key Issues and Trends

## 3.1 Energy Consumption and Accessibility

| Year | Type of Energy | Electricity   | Battery | Fuel wood | Others |
|------|----------------|---------------|---------|-----------|--------|
| 2006 | Stung Treng    | 18.10%        | 17.83%  | >90       | ?      |
|      | Kratie         | 10.08%        | 57.00%  | >90       | ?      |
| 2007 | Stung Treng    | 17.83%        | 18.96%  | ?         | ?      |
|      | Kratie         | 11.00%        | 59.00%  | ?         | ?      |
| 2008 | Stung Treng    | <u>17.70%</u> | 20.51%  | ?         | ?      |
|      | Kratie         | <u>14.04%</u> | 63.00%  | ?         | ?      |

Both provinces access and consume electricity less than national wide target in 2008 (22%)

# Electricity at Glance Nationwide

| Description                      | 2008    | %     |
|----------------------------------|---------|-------|
| • Energy Capacity (MW)           | 384.60  | 22.33 |
| • Energy Generated (GWh)         | 1,484.1 | 80    |
| Energy Imported (GWh)            | 374.1   | 20    |
| • Total Energy Available (GWh)   | 1,858.2 | 100   |
| • Number of Registered Consumers | 487,426 | 3.64  |
| •                                |         |       |

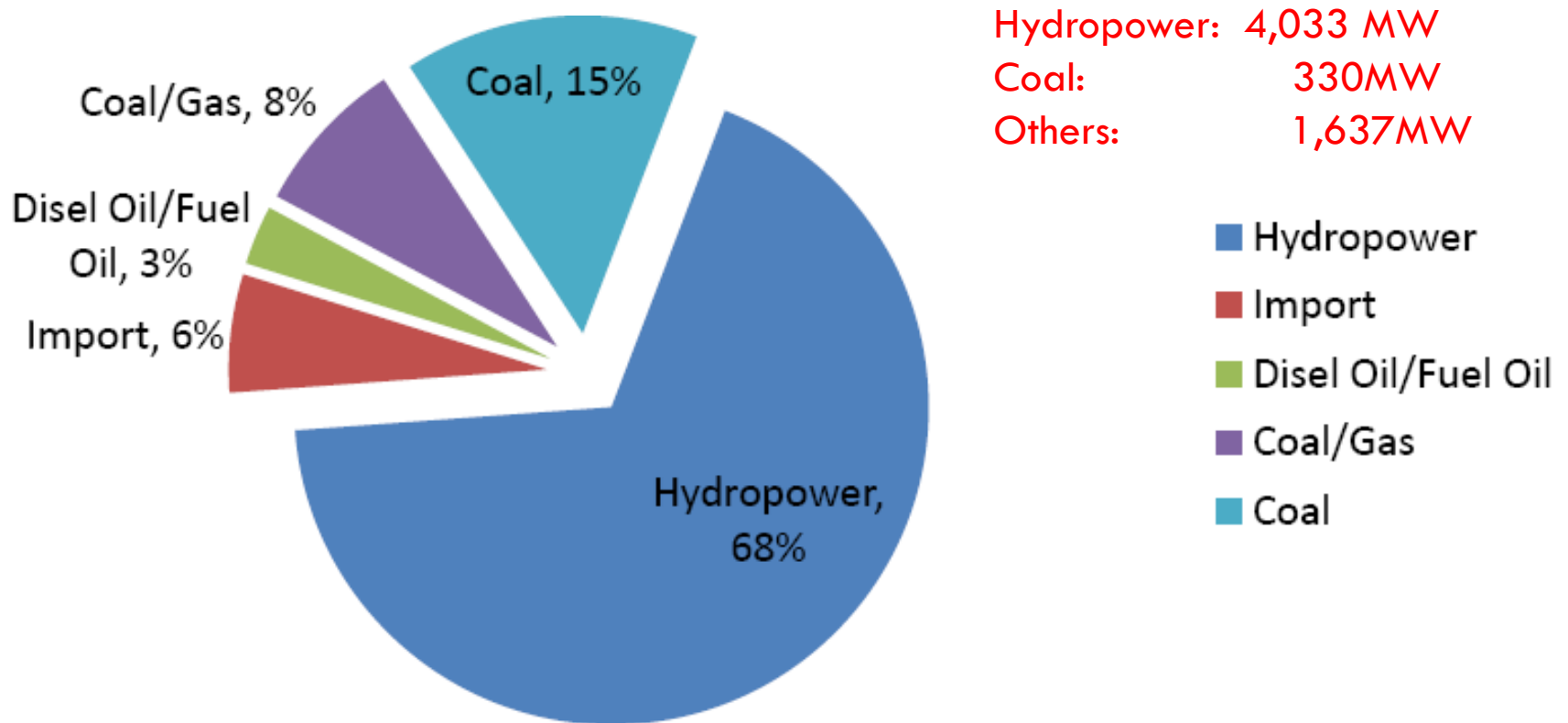
Source: Report on the Power Sector of Cambodia. EAC (August 2009)

**As this overview shows, electricity sector is a strong need sector for development in Cambodia.**

# Electricity Supply Plan by Fuel Type of Some Provinces

| Provinces      | Number of consumers | Installed Capacity MW | Energy Imported GWh | Energy generated GWh | Energy Sold to consumers GWh |
|----------------|---------------------|-----------------------|---------------------|----------------------|------------------------------|
| Kampong Cham   | 31,577              | 18.6                  | 27.6                | 24.5                 | 44.8                         |
| Kratie         | 6,418               | 2.1                   | 1.9                 | 4.4                  | 5.0                          |
| Stueng Treang  | 2,423               | 1.7                   | 0.0                 | 3.5                  | 3.1                          |
| Kampong Thom   | 9,013               | 3.2                   | 0.0                 | 4.6                  | 3.6                          |
| Preah Vihear   | 2,699               | 1.7                   | 0.0                 | 1.4                  | 1.1                          |
| Ratanakiri     | 2,667               | 2.0                   | 0.0                 | 5.8                  | 5.0                          |
| Siem Reap      | 23,289              | 12.0                  | 0.0                 | 1.4                  | 117.6                        |
| Uddor Meanchay | 3,387               | 0.7                   | 10.5                | 0.5                  | 10.5                         |
| Country Total  | 487,426             | 384.6                 | 1,664.4             | 1,484.1              | 374.3                        |

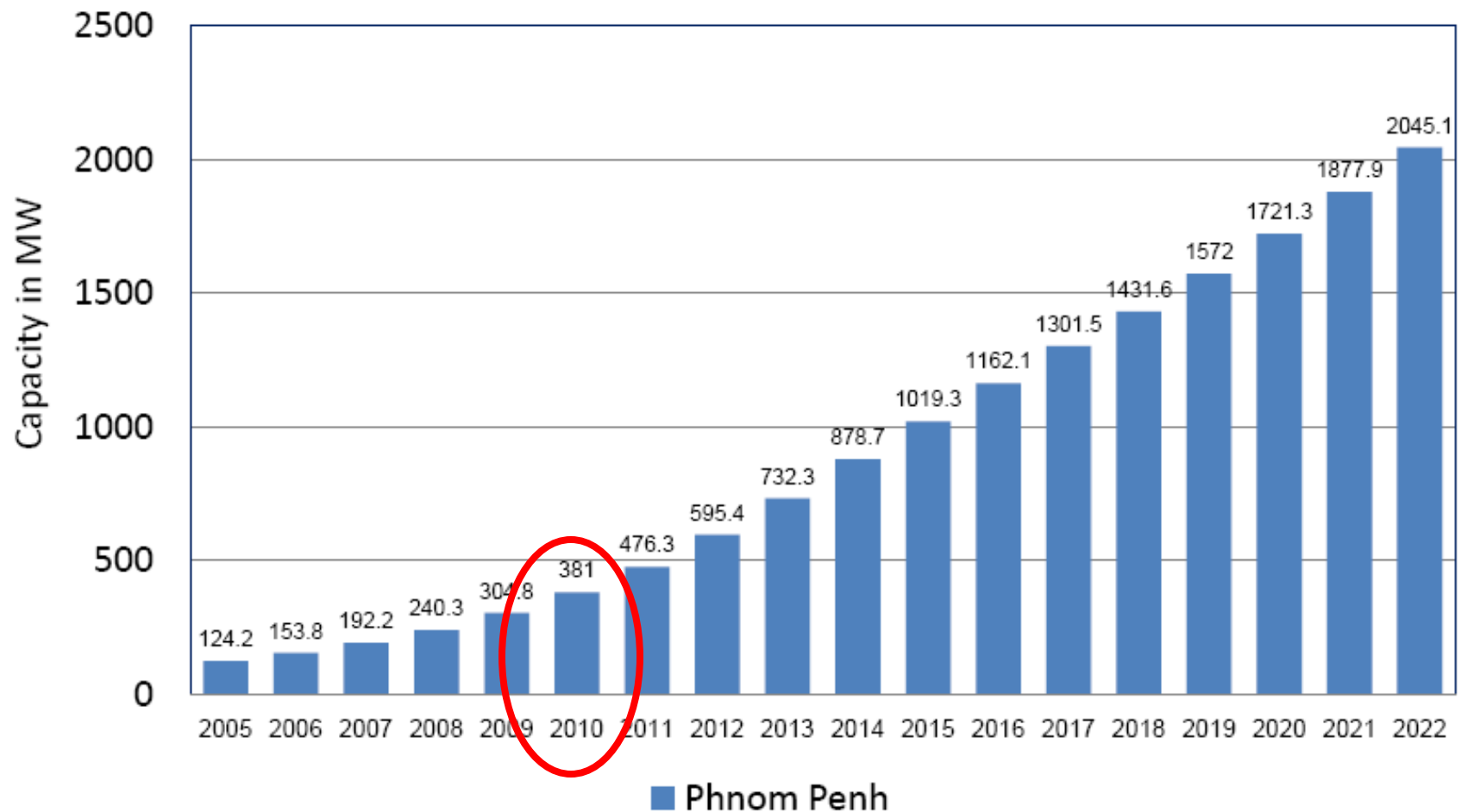
# Electricity Supply Plan by Fuel Type in Year 2020, **6000 MW** (MIME)



In 2022, the share of electricity from hydropower is expected to be **15 times** higher than now (**384.6MW**)

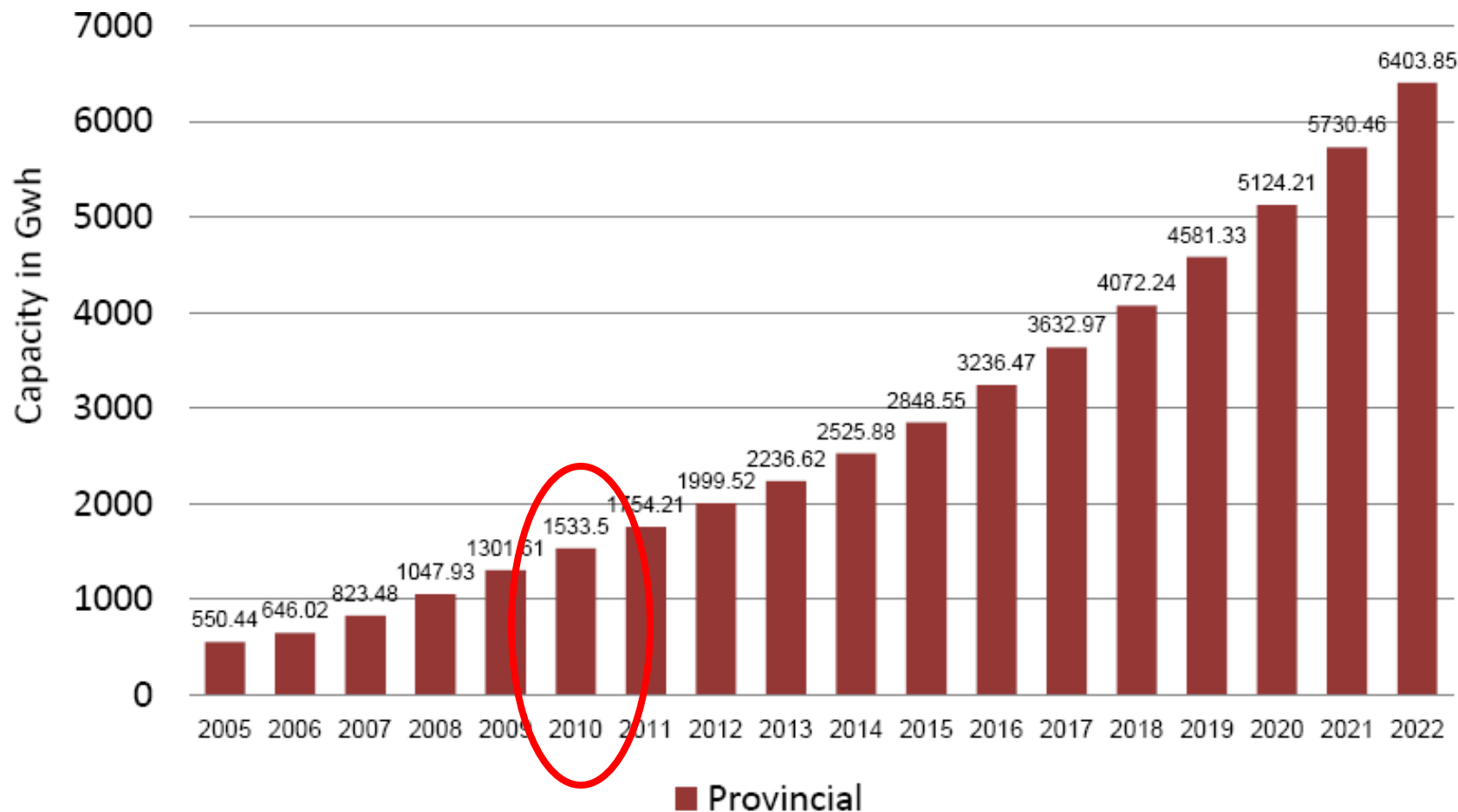


# Electricity Demand in Phnom Penh in 2022



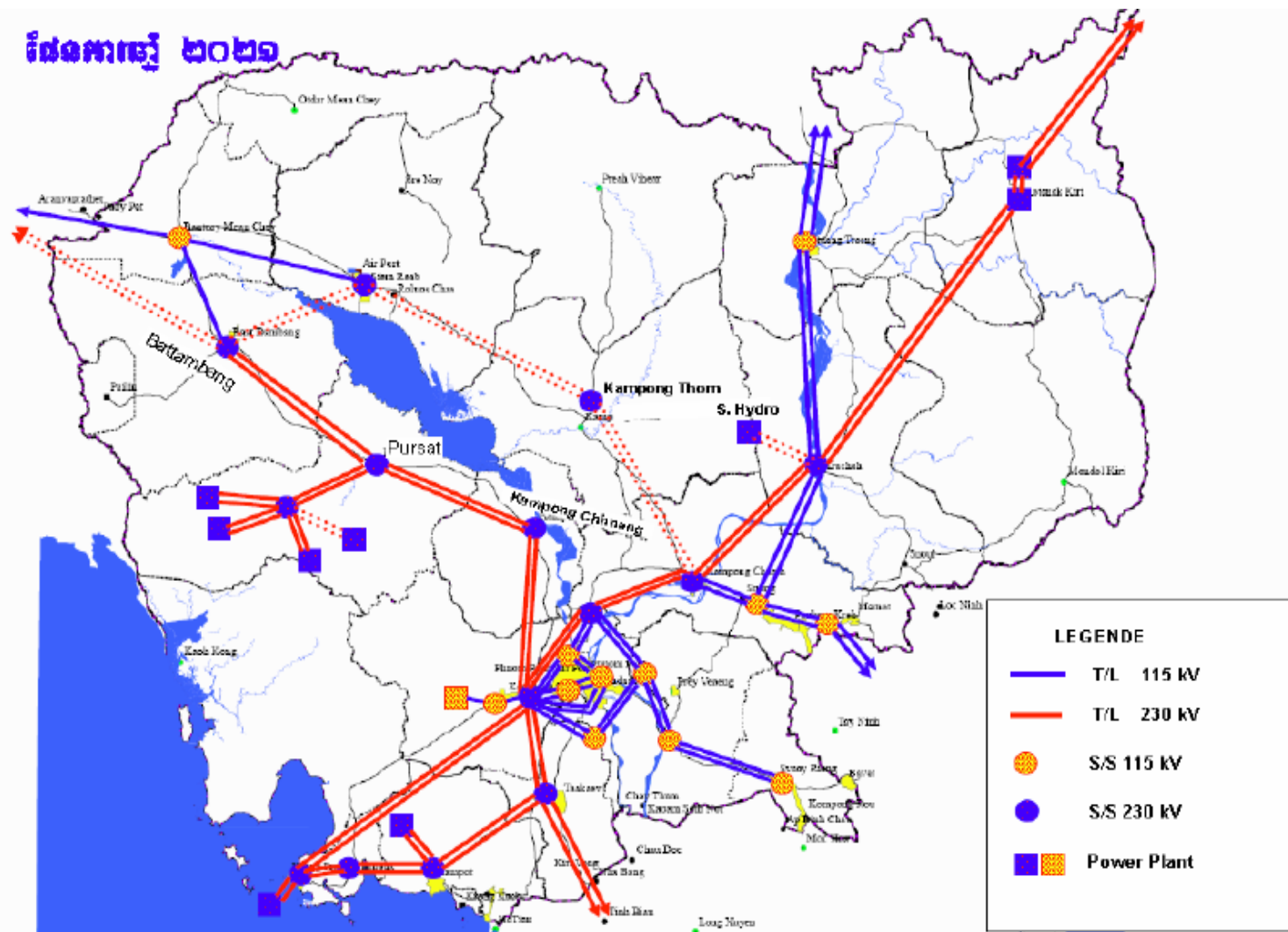
**Phnom Penh electricity demand in 2022 will be 5 times higher than now**

# Electricity Demand in Provinces/Towns 2005-2022 (Source EDC)



**Electricity demands of Provincial area in 2022 will be 4 times higher than now**

# Plan for 2021 (Source EDC)



# Current Plan by NSDP 2009-2013

1. Import 200 MW from Vietnam in 2009 to supply power to Phnom Penh.
2. Import 20 MW from Vietnam in 2009 to supply power to Kampong Cham.
3. **Import 20 MW from Lao PDR in 2009 to supply power to Stung Treng.**
4. Complete work on the Kirirom Hydropower Station 3 to provide an additional 18 MW in 2010.
5. Complete work on the Kamchay Hydropower Station to provide an additional 193 MW in 2010.
6. Complete work on the Electricity plant powered by imported coal to provide an additional 200 MW in 2010.
7. Import an additional 60 MW from Thailand in 2010 2009 to supply power to Banteay Meanchey.
8. Complete work on the Electricity plant powered by imported coal to generate 100 MW in 2011 to serve coastal areas.
9. Complete work on the Stung Atai Hydropower Station in 2012 to generate 120MW.



## 3.2 Fisheries



# Current Situation and Key Issues

**Fisheries:** very limited information and underestimated in the two provinces

- Inland fish production (tons) from commercial and industrial fisheries in 2007 was available from FiA 2009.

## **Aquaculture:**

- Kratie produces 50 tons in 2007 and 380 tons t in 2009
- Stung Treng produces only 15t in 2007. No data in 2009.

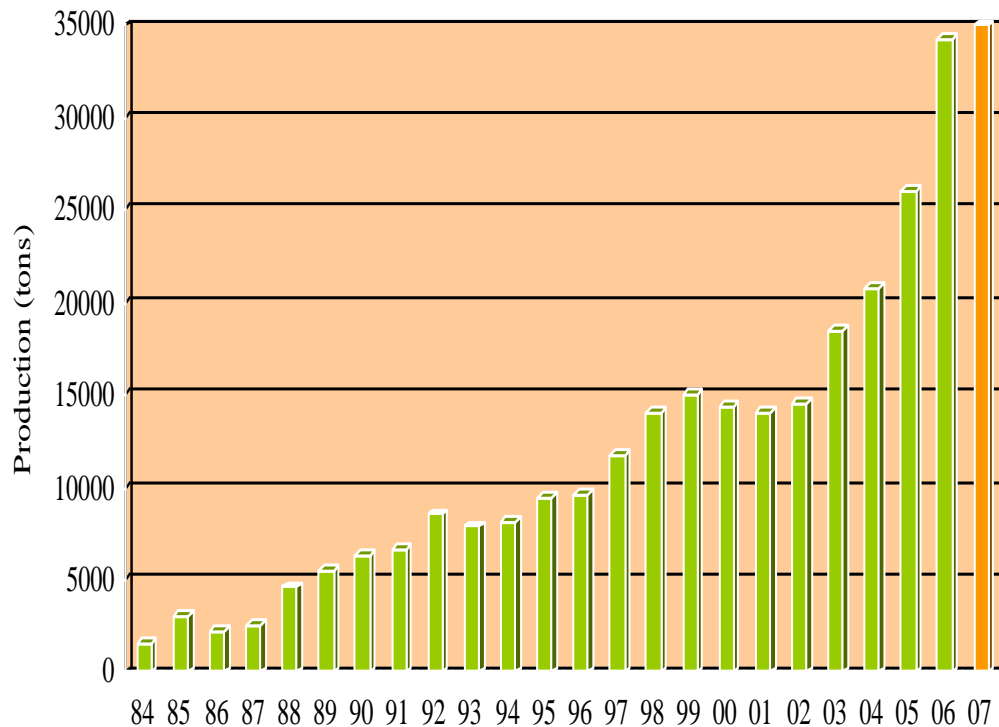
## **Community Fishery:**

- In 2007, 500 CF formed
- 60% official recognized,
- 31% has CF maps,
- 13% had annual action plan and
- 17% had fish sanctuary zones.
- Total beneficiaries: 381,559 people ( 114,284 households).
- Up to 2009, 173 CFs received formal and legal approval for their operation.
- **56 in Kratie**
- **51 in Stung Treng.**

# Commercial and Industrial Fish Catch Production

| Provinces                | Catch in 2007 (ton) |             | Catch in 2009 (ton) |
|--------------------------|---------------------|-------------|---------------------|
| Banteay Mean Chey        | 2,000               |             |                     |
| Battambang               | 10,000              |             |                     |
| Kampong Cham             | 6,000               |             |                     |
| Kampong Chhnang          | 17,000              |             |                     |
| Kampong Thom             | 10,500              |             |                     |
| Kandal                   | 35,000              |             |                     |
| <b>Kratie</b>            | <b>2,000</b>        | <b>1.6%</b> | <b>6,373</b>        |
| Phnom Penh               | 9,500               |             |                     |
| Prey Veng                | 3,000               |             |                     |
| Pursat                   | 14,000              |             |                     |
| Rotanakiri               | 400                 |             |                     |
| Siem Reap                | 12,000              |             |                     |
| <b>Stung Treng</b>       | <b>2,000</b>        | <b>1.6%</b> | <b>1,885</b>        |
| Takeo                    | 1,500               |             |                     |
| Otdar Mean Chey          | 100                 |             |                     |
| <b>Total all sources</b> | <b>125,000</b>      |             |                     |

# Aquaculture



| Location of production   | 2007          |
|--------------------------|---------------|
| Banteay Mean Chey        | 75            |
| Battambang               | 880           |
| Kampong Cham             | 1,400         |
| Kampong Chhnang          | 500           |
| Kampong Speu             | 3,500         |
| Kampong Thom             | 4,200         |
| Kandal                   | 9,100         |
| Kratie                   | 50            |
| Pailin                   | 30            |
| Phnom Penh               | 8,400         |
| Prey Veng                | 850           |
| Phreah Vihea             | 10            |
| Pursat                   | 2,010         |
| Rotanakiri               | 15            |
| Siem Reap                | 750           |
| Stung Treng              | 15            |
| Svay Rieng               | 500           |
| Takeo                    | 1,000         |
| Otdar Mean Chey          | 105           |
| <b>Total all sources</b> | <b>33,390</b> |



# Cambodia's exports, 2002-2007

MAFF reported that fishery sector contributes about \$250-\$500 million per year, 12% of GDP (Fishery Administration)

|   | 2002             | 2003             | 2004             | 2005             | 2006             | 2007             |
|---|------------------|------------------|------------------|------------------|------------------|------------------|
| Total exports (in millions US\$)                                  | 1,770            | 2,087            | 2,589            | 2,910            | 3,694            | 4,089            |
| Garment exports (in million US\$,<br>as percent of total exports) | 1,343<br>(75.9%) | 1,609<br>(77.1%) | 1,982<br>(76.6%) | 2,190<br>(75.3%) | 2,651<br>(71.8%) | 2,866<br>(70.1%) |
| Log and sawn timber (US\$, million)                               | 38               | 20               | 16               | 16               | 18               | 21               |
| Fish (US\$, million)  | 73               | 76               | 69               | 76               | 90               | 105              |
| Rubber (US\$, million)  | 63               | 98               | 115              | 119              | 175              | 157              |
| Rice (US\$, million)  | 28               | 94               | 114              | 177              | 332              | 411              |

Source: IMF and MoC

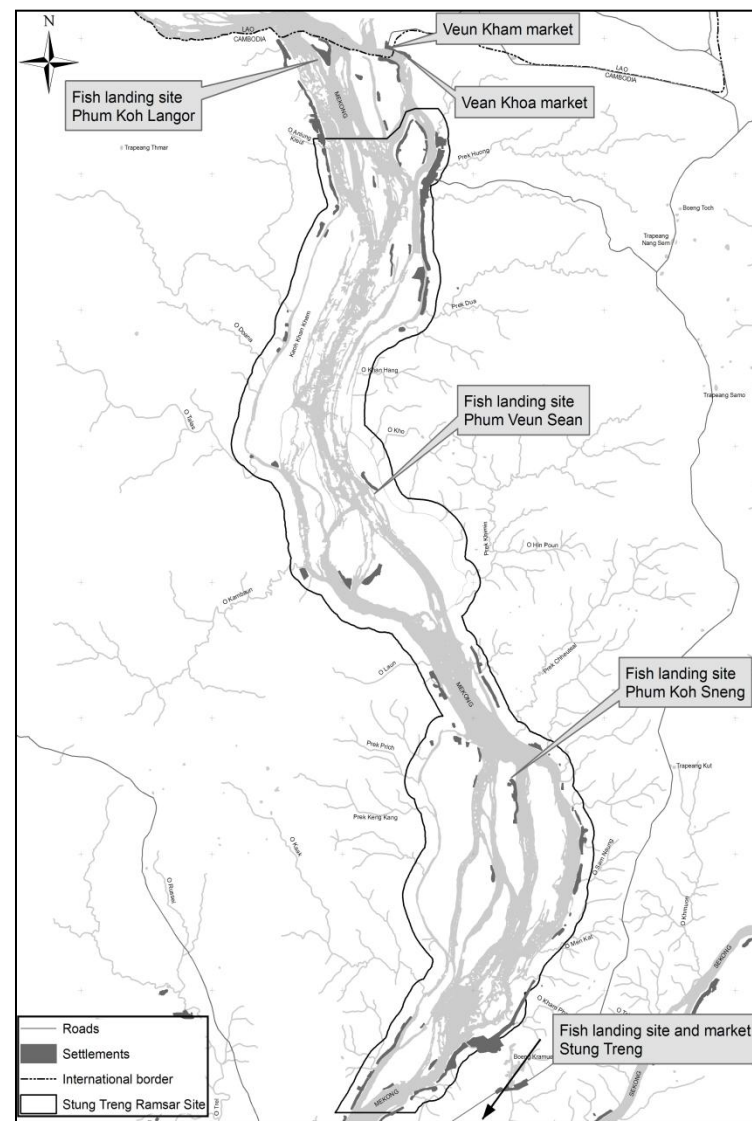
# Fish catch at village level

- **Stung Treng:** Fish catch from existing studies:
- Joanne Chong and IUCN 2005: about **US\$ 3,000** per household/year by using total average value of wetland resources which include: fishing, washing, cooking, drinking, transportation, construction materials, fuel wood, aquatic, water bird, reptiles, irrigation, traditional medicine, recreation. (21 villages, 2375 families = **US\$7,125,000** (**US\$488/ha with 14,000 ha Ramsar site**)).

# IUCN/ODG/DEV 2008

Koh Khorndin : 69 hh/130 hh involved regular fishing

| Months 2005-2006 | Mean household fish catch (kg/month/hh) | Mean Fish Price (Riel/kg) | Gross household income (Riel) | Gross household costs (Riel) |
|------------------|---|---------------------------|-------------------------------|------------------------------|
| Oct 2005         | 56                                      | 5,000                     | 280,000                       | 121,666                      |
| Nov              | 100                                     | 4,500                     | 450,000                       | 121,666                      |
| Dec              | 260                                     | 4,500                     | 1170,000                      | 121,666                      |
| Jan 2006         | 260                                     | 4,500                     | 1170,000                      | 304,000                      |
| Feb              | 42                                      | 5,000                     | 210,000                       | 304,000                      |
| March            | 152                                     | 2,700                     | 410,400                       | 304,000                      |
| April            | 224                                     | 2,700                     | 604,800                       | 60,800                       |
| May              | 200                                     | 2,700                     | 540,000                       | 60,800                       |
| June             | 20                                      | 5,500                     | 110,000                       | 60,800                       |
| July             | 42                                      | 5,500                     | 231,000                       | 26,040                       |
| August           | 96                                      | 5,000                     | 480,000                       | 30,400                       |
| Sept             | 92                                      | 5,500                     | 506,000                       | 30,400                       |
| <b>Total</b>     | <b>1544</b>                             |                           | <b>6,162,200</b>              | <b>1,546,238</b>             |



# Koh Langor village

- 68 families: 63 men and 178 women : 22 ha for paddies

| Date              | Household fish catch (Kg/month/hh) | Mean fish Price (Riel/kg) | Mean household income (Riel) | Total village fish catch / month (Kg) |
|-------------------|------------------------------------|---------------------------|------------------------------|---------------------------------------|
| Oct.2005          | 8                                  | 3,500                     | 28,000                       | 544                                   |
| Nov.              | 8                                  | 5,000                     | 40,000                       | 544                                   |
| Dec.              | 8                                  | 5,000                     | 40,000                       | 544                                   |
| Jan.2006          | 12                                 | 3,500                     | 42,000                       | 816                                   |
| Feb.              | 12                                 | 3,500                     | 42,000                       | 816                                   |
| Mar.              | 12                                 | 3,500                     | 42,000                       | 816                                   |
| Apr.              | 12                                 | 3,500                     | 42,000                       | 816                                   |
| May               | 98                                 | 3,000                     | 294,000                      | 6,664                                 |
| June              | 100                                | 6,500                     | 650,000                      | 6,800                                 |
| July              | 100                                | 6,500                     | 650,000                      | 6,800                                 |
| Aug.              | 100                                | 6,000                     | 600,000                      | 6,800                                 |
| Sept.             | 100                                | 6,000                     | 600,000                      | 6,800                                 |
| <b>Total year</b> | <b>570</b>                         | <b>Mean: 4,625</b>        | <b>3,070,000</b>             | <b>38,760</b>                         |

Trey Riel is never count by local people





### 3.3 Livelihoods and development trend



# Current situation

## *Livelihood and occupation in the provinces*

|                    |             | 2006   | 2007   | 2008   |
|--------------------|-------------|--------|--------|--------|
| Kratie             | Agriculture | 80.62% | 81.67% | 81.95% |
|                    | Handicraft  | 0.66%  | 0.62%  | 0.67%  |
|                    | Services    | 6.38%  | 8.09%  | 7.57%  |
|                    | Others      | 12.34% | 9.62%  | 9.81%  |
| Stung Treng        | Agriculture | 82.79% | 83.86% | 84.94% |
|                    | Handicraft  | 0.36%  | 0.33%  | 0.44%  |
|                    | Services    | 3.48%  | 2.91%  | 10.13% |
|                    | Others      | 12.34% | 9.62%  | 9.81%  |
| Cambodia (WB 2009) | Agriculture |        |        | 59     |

How much if compare to national wide?

# Current situation

## *Land use planning*

| Land Use Classification  | Stung Treng | Kratie    |
|--------------------------|-------------|-----------|
|                          | Area (ha)   | Area (ha) |
| Forested land            | 928,000     | 926,349   |
| Agricultural land        | 126,836     | 88,752    |
| Residential land         | 103,217     |           |
| Road                     | 2,496       |           |
| River, stream and creeks | 41,094      |           |
| Red Soil                 |             | 5,547     |
| Fishing domain           |             | 88,752    |
| TOTAL                    | 1,201,643   | 1,109,400 |

How much if compare to national wide?

# Current situation

## *Irrigation Scheme*

| District of  | # of Irrigation Schemes | Current irrigated areas (ha) |            |
|--|-------------------------|------------------------------|------------|
| Kratie province (2009)                               |                         | Dry season                   | Wet season |
| Kratie   | 45                      | 1392.33                      | 1661.58    |
| Chhloung   | 45                      | 2297.38                      | 194.11     |
| Prek Prasab  | 40                      | 4320.30                      | 90.20      |
| Snuol  | 34                      | 0.5                          | 1231.71    |
| Sambo  | 18                      | 240.4                        | 867.55     |
| Total  | 181                     | 8,250.91                     | 4,045.15   |
| Stung Treng province (2007) Potential irrigated only |                         |                              |            |
| Siem Pang  | 10                      | 345                          | 1140       |
| Thalaboriwat   | 3                       | 241                          | 535        |
| Siem Bok   | 4                       | 180                          | 680        |
| Sesan  | 6                       | 190                          | 410        |
| Stung Treng  | 5                       | 118                          | 365        |
| Total  | 28                      | 1,074                        | 3,130      |



# List of Irrigation scheme across Cambodia

| District of  | # of Irrigation Schemes | Current irrigated areas (ha) |            |
|--|-------------------------|------------------------------|------------|
| Kratie province (2009)                               |                         | Dry season                   | Wet season |
| Total  | 181                     | 8,250.91                     | 4,045.15   |
| Stung Treng province (2007) Potential irrigated only |                         |                              |            |
| Total  | 28                      | 1,074                        | 3,130      |
| Cambodia   |                         |                              |            |
| 2007 (MOWRAM)  | 2403                    | 417,235                      | 629,028    |
| CEDAC (2009)   | 2,525                   | 321,167                      | 901,543    |

**Among 2,525 schemes only 6% function well, 32% are partially function and 62% are not function.**

# Irrigation investment 2008-2015

- By mid-October 2009 revealed **26 projects** are officially approved of which 10 projects are grants with total fund of **US\$94,480,000** and **16 projects are loan** with total budget **US\$ 1,008,200,000**. These are the projects being active from 2008 to 2015.
- Major donors include JICA, ADB, IMF, AFD, KOICA, **Kuwait, Qatar, China**, India, Australia, and Italia.

# Map of irrigation investment

**Major irrigation schemes are being proposed and developed along Mekong floodplain and Tonle Sap Great Lake as well as Tonle Basac floodplain in Cambodia**



# Trend of Land Use Allocation

## *Agro-industry and economic land concession*



| Provinces   | # of Companies                                       | Total land allocation |
|-------------|--|-----------------------|
| Kratie      | <b>46 Economic land concession</b>                   | <b>298,071 Ha</b>     |
|             | >1000 ha: 25 companies                               | 281,604 Ha            |
|             | < 1000 ha: 21 companies                              | 16,467 Ha             |
|             | <b>21 economic land concession in Sambo district</b> | <b>140,192 ha</b>     |
| Stung Treng | <b>13 Economic land concession</b>                   | <b>195,105 ha</b>     |
|             | > 1,000 ha : 12 companies                            | 194,236 ha            |
|             | <1,000 ha: 1 companies                               | 869 ha                |
|             | 13 mining companies                                  | 203,400ha             |

# Stung Treng Province Plan for 2010

| Sectoral                              | Number of projects | Estimated budget (US\$) |
|---------------------------------------|--------------------|-------------------------|
| AGRICULTURAL DEVELOPMENT              | 2                  | 63,000                  |
| COMMUNITY BASE ECOTOURISM             | 3                  | 414,575                 |
| ENVIRONMENT SECTOR                    | 1                  | 100,000                 |
| IRRIGATION RENOVATION AND DEVELOPMENT | 4                  | 394,500                 |
| HEALTH DEVELOPMENT SECTOR             | 3                  | 450,000                 |
| SMALL-SCALE HYDROPOWER SCHEME         | 4                  | 540,000                 |
| TRADE AND COMMERCIAL SECTOR           | 5                  | 575,000                 |
| INFRASTRUCTURE DEVELOPMENT SECTOR     | 13                 | 7,915,000               |
| Total                                 | 35                 | 10,452,075              |

Source: Triangle Development Cambodia, Vietnam and Lao

## Tourism Plans for Northeast Cambodia (kwon as upper Mekong in Cambodia):

- **Kratie:** Dolphin areas a cultural sites:
- **2005: 75,000** domestic and **7,612** foreigners.
- **2006:** 82,000 domestic and **10,844** foreigners.
- **Stung Treng:** Ramsar Site with domestic tourists in 2005/2006 showed **29,968** domestic tourists and **50,910** International arrivals. Most tourists visit Ramsar Site which provides potential value for both conservation and ecotourism purposes.

# Conclusions

- ❑ Changes from more relaxed lifestyle
- ❑ Fishery resources and its natural wetland habitat
- ❑ More agro-industry to be introduced ( no proper study and suitability studies, lack of local consultation)
- ❑ Hydropower development remain options for poverty alleviation and export oriented