

# **MRC SEA OF HYDROPOWER ON THE MAINSTREAM MEKONG**

## **OVERVIEW OF FINDINGS & RECOMMENDATIONS**

*1<sup>ST</sup> MEETING OF CSCAP STUDY GROUP ON WATER RESOURCES SECURITY  
HANOI, VIET NAM | 22-23 MARCH 2011*

# Presentation overview

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1. Introduction to the 12 mainstream hydropower projects
2. Scope of the SEA
3. SEA methodology
4. The “big issues” & key findings
5. Strategic options, conclusions & recommendations



# Why did LMB countries conduct the SEA?

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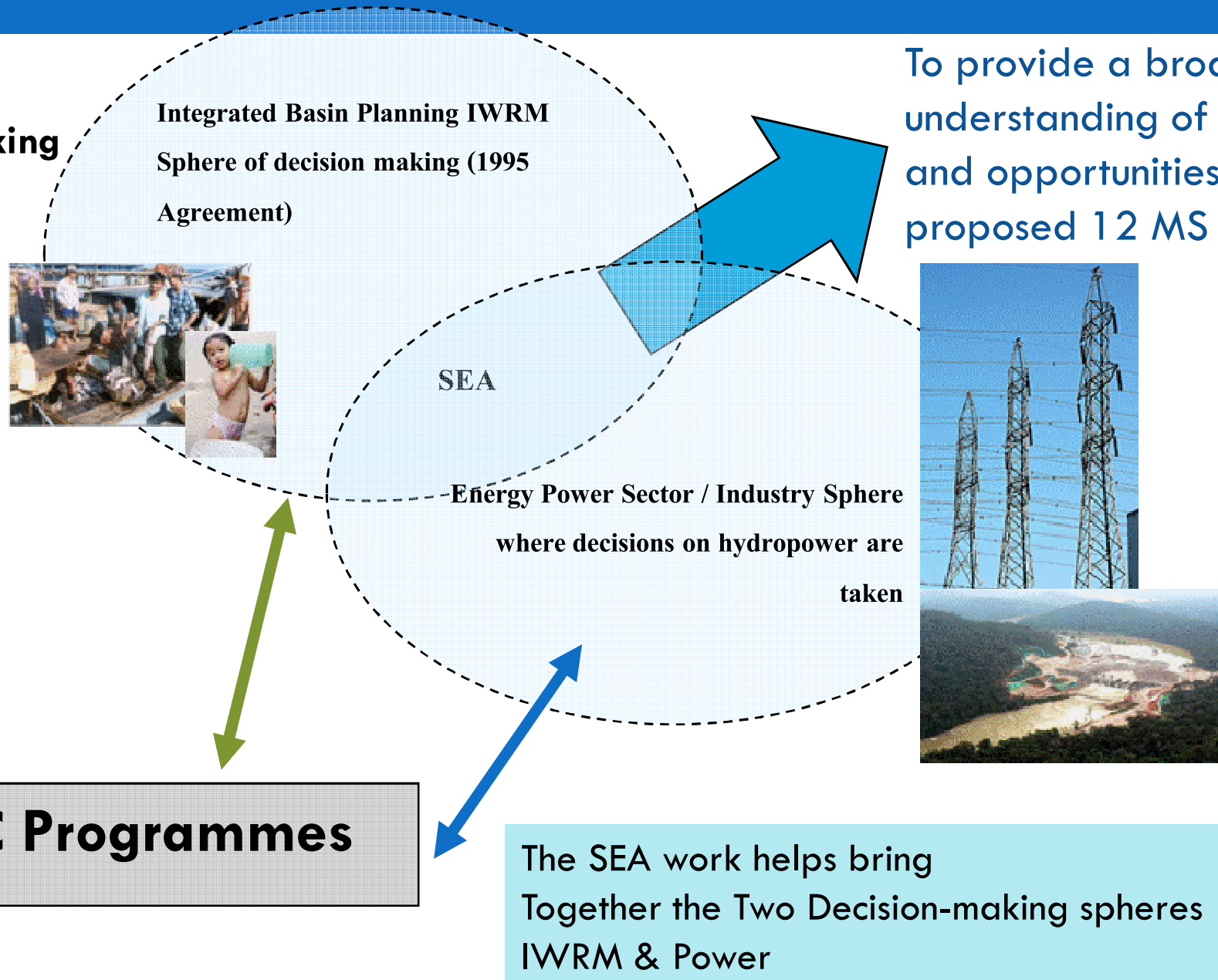
- Mainstream hydropower has been one of the strategic decisions for the Mekong Basin since the 1960s, and remains so because:
  - ▣ Large wealth of natural resources
  - ▣ Health & connectivity of natural systems
  - ▣ High dependency on natural resources for livelihoods
  - ▣ Some of the fastest economic & energy growth rates in the world



# Broad aim of the SEA

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## In Practice 2 Decision-making Spheres



# The projects

No	MAINSTREAM PROJECT	DEVELOPER
1	Pak Beng	<b>China:</b> Datang International Power Generation <i>IEE submitted</i>
2	Luang Prabang	<b>Vietnam:</b> PETROVIETNAM Power Corporation <i>Feasibility study</i>
3	Xayaburi	<b>Thailand:</b> SEAN & Ch. Karnchang Public <i>Feasibility study &amp; full ESIA submitted</i>
4	Pak Lay	<b>China:</b> CEIEC & Sino-Hydro <i>IEE submitted</i>
5	Xanakham	<b>China:</b> Datang International Power Generation
6	Pak Chom	<b>Thailand/Laos:</b> <i>Joint feasibility study</i>
7	Lat Sua	<b>Thailand:</b> Italian Thai Asia Corp. Holdings <i>Pre-feasibility study submitted</i>
8	Ban Koum	<b>Thailand:</b> Charoen Energy & Waters Asia
9	Don Sahong	<b>Malaysia:</b> Mega First <i>Full EIA submitted</i>
10	Thakho	<b>France:</b> Compagnie Nationale du Rhone and EDL <i>IEE submitted</i>
11	Stung Treng	<b>Vietnam</b>
12	Sambor	<b>China:</b> Southern Power Grid <i>Pre-feasibility study submitted</i>



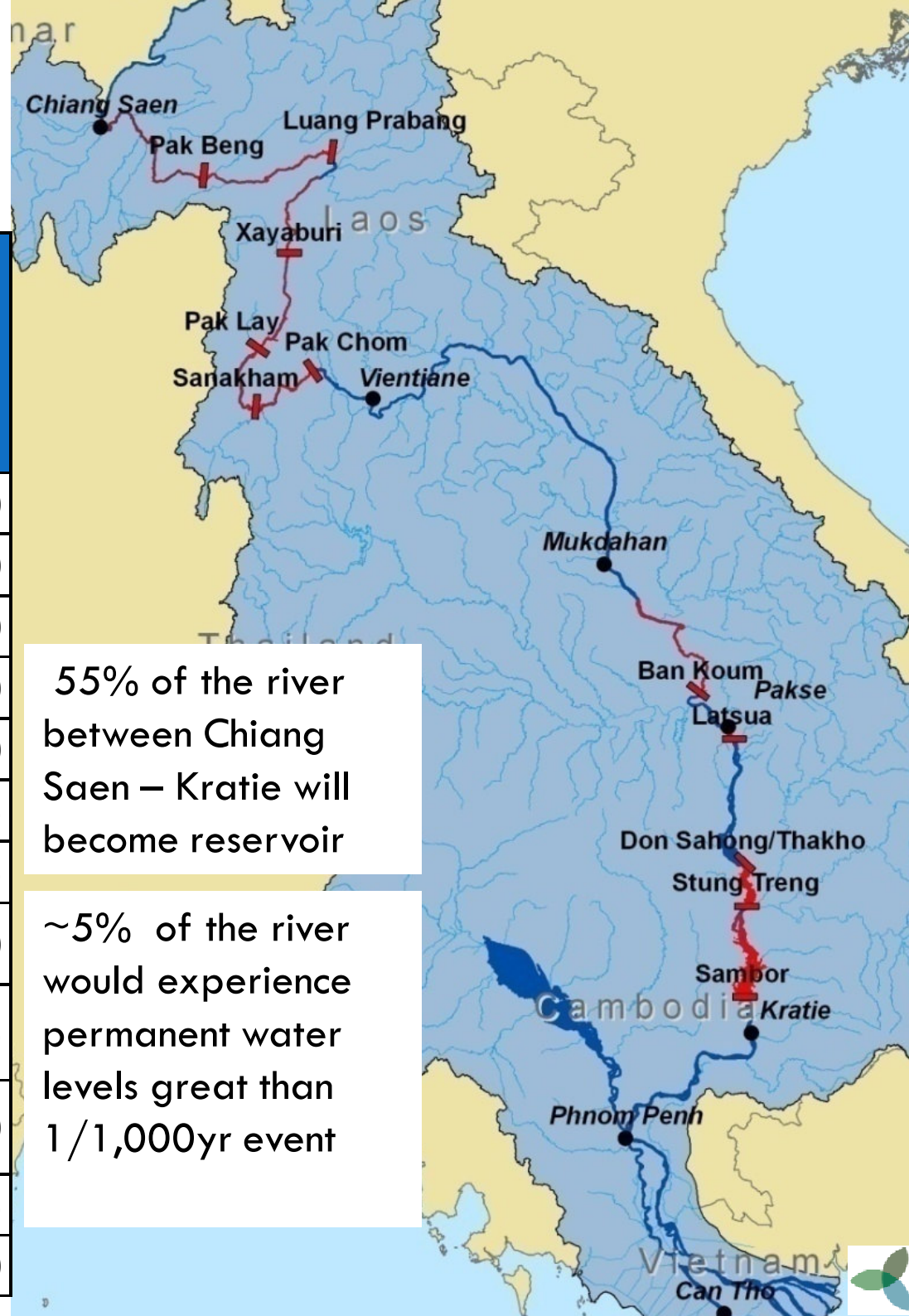


# Project footprints

MAINSTREAM DAM	Reservoir area (km2)	Reservoir Length (km)
Pak Beng	87	180
Luang Prabang	90	150
Xayaburi	49	100
Pak Lay	108	110
Sanakham	81	90
Pakchom	74	85
Ban Koum	133	155
Lat Sua	13	10
Don Sahong	290 (ha)	5
Thakho diversion	n/a	0
Stung Treng	211	45
Sambor	620	90

55% of the river between Chiang Saen – Kratie will become reservoir

~5% of the river would experience permanent water levels great than 1/1,000yr event



# This SEA...

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- ❑ was commissioned by the Mekong River Commission (MRC);
- ❑ was coordinated through its Initiative for Sustainable Hydropower (ISH) and worked with all MRC programmes
- ❑ Involved consultations with more than 60 government agencies & 40 NGOs
- ❑ Began in May 2009 and completed in Oct 2010
- ❑ Team of 24 international & national specialists



# SEA scope

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- Sectors assessed:
  1. Power systems
  2. Economics
  3. Hydrology & sediment
  4. Terrestrial systems
  5. Aquatic systems
  6. Fisheries
  7. Social systems
  8. Navigation
  9. Climate change
- Baseline: 2000 – 2010
- Future time-slice: 2010 - 2030





# The context for this SEA

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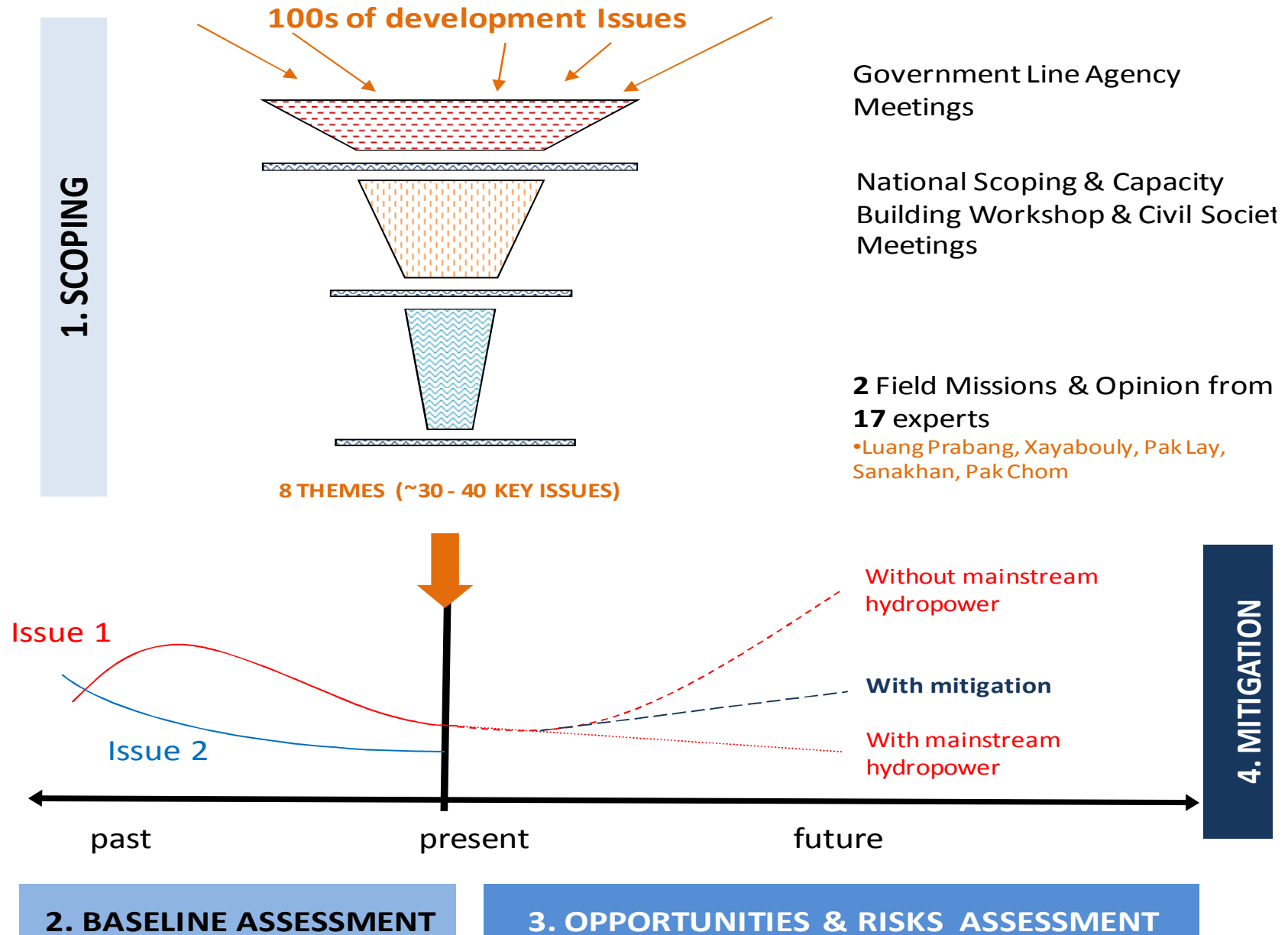
- contributing to a decision-making process relating to 12 hydropower schemes without a clear & regionally accepted planning framework
  - ▣ Each country is making sovereign decisions with transboundary implications
  - ▣ there is a commitment to notify, consult and seek to reach agreement with neighbours through the MRC PNPCA\*
- All 4 LMB countries play a role in the decision making:
  - ▣ The 12 projects are sovereign decisions of Cambodia, Lao PDR & Thailand
  - ▣ Thailand & Vietnam are targeted to purchase ~90% of the generated electricity and projects could not proceed as planned without a commitment to purchase the power
- The SEA utilises the existing scientific evidence base – there was little scope for new research
- There are many remaining gaps and uncertainties in our knowledge about the opportunities & risks

\* PNPCA = Prior Notification Prior Consultation Procedure



# Overview of the analysis...

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# The “big strategic issues”

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1. **Power security and generation** *including revenue, trade and foreign investment*
2. **Economic development and poverty alleviation**
3. **Ecosystems integrity and diversity** – *aquatic, terrestrial, hydrological dynamics and sediment/nutrient transport.*
4. **Fisheries and food security** *(including agriculture)*
5. **Social systems** - *livelihoods and the living cultures of affected communities*



# 1. Power Generation & security

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- **Large projects producing a significant quantum of power:** 14,697 MW, or 23 - 28% of the national hydropower potential of the 4 LMB countries
- **Not critical in terms of regional power sector:**
  - ▣ Mainstream projects contribute 6-8% of the projected LMB power demand for 2025, equivalent to the expected LMB energy demand growth rate experienced each year between 2015 and 2025
  - ▣ Minor impact on electricity prices at regional(<1.5%) , and national levels
- **Lao PDR gains most from the overall mainstream power benefits,** but has many alternatives for export & domestic supply
- **The mainstream proposals are most critical to power sector development in Cambodia**
  - ▣ heavily dependent on expensive imported oil and most limited range of alternative options



## 2. Economic development & poverty alleviation— export revenues

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- Export revenues ~USD3-4billion/yr for all 12 projects
  - ▣ Lao projects: USD 2.6-2.8billion/yr
  - ▣ Cambodian projects: USD 1.2-1.4 billion/yr
- During the BOT\* concession period (0-25yrs):
  - ▣ 26-31% of project benefits would accrue to national governments
  - ▣ Remainder to developers, investors and project expenses
- After handover:
  - ▣ States would accrue all benefits and all maintenance/repair obligations

\*BOT = Built, operate, transfer



## 2. Economic development & poverty alleviation – FDI & sectoral impacts

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- significant economic stimulus to the host countries and the region (FDI ~USD25billion)
- ~50% of FDI would be spent outside host countries
- Fisheries and agriculture: losses are an order of magnitude greater than the realistic benefits:
  - Fisheries losses ~USD 476 million/yr
  - Agricultural losses ~USD 33.1million/yr
  - Reservoir fishery gains ~USD 14million/yr
  - Expanded irrigation ~USD15.5million/yr
- *LMB mainstream projects would likely contribute to a growing inequality and a short to medium term worsening of poverty in LMB countries*





### 3. Ecosystem integrity – habitat & connectivity & biodiversity

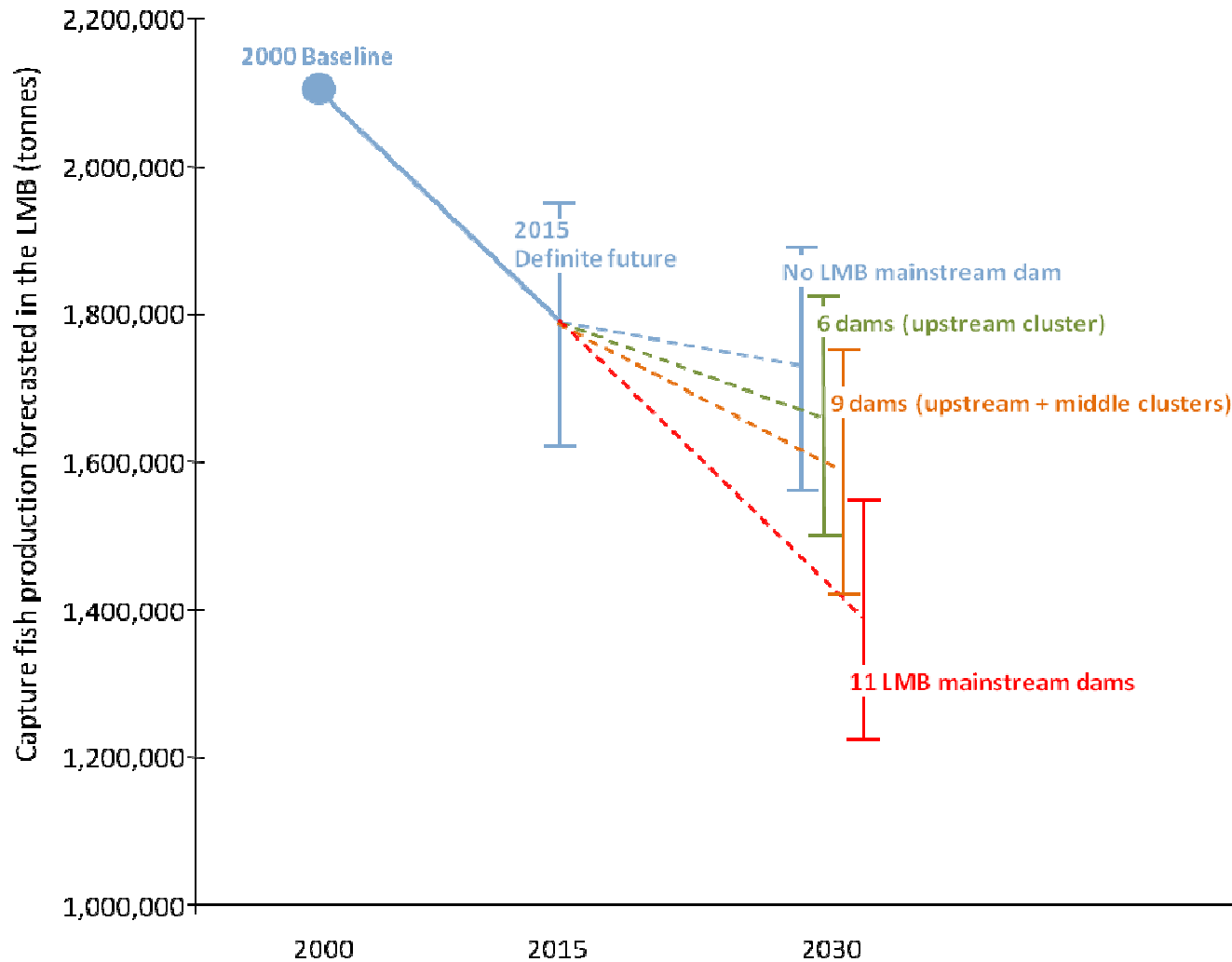
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- *Loss of longitudinal connectivity of the Mekong ecosystem, compartmentalising it into smaller and far less productive units*
- *an irreversible compromise to natural system integrity:*
  - ▣ ~40% of the Mekong River's wetlands affected (~17% permanently inundated)
  - ▣ Loss or reduction in important Mekong transition seasons
  - ▣ Sediment load drop by ~50% for 2030 *without* LMB mainstream
  - ▣ Sediment load will drop by 75% *with* LMB mainstream with major consequences for delta stability, floodplain fertilisation and coastal fishery
- **Peaking operation:** 3-6m spikes in water levels in towns 40-50km downstream of a project
  - ▣ Little time for notification (1-2hours)
  - ▣ Potentially even larger during emergency or unplanned releases
- *permanent and irreplaceable global loss of biodiversity, including the extinction of a number of globally endangered species, which cannot be compensated*



# 4. Fisheries & food security - production

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Mainstream projects:

- **Would fundamentally undermine the abundance, productivity and diversity of the Mekong fish resources,** affecting the millions of rural people who rely on it for nutrition and livelihoods
- **~340,000 tonnes/year from mainstream projects** ~110% the total annual livestock production in Cambodia & Lao PDR
- Fish passes are not a realistic mitigation option for Mekong mainstream dams

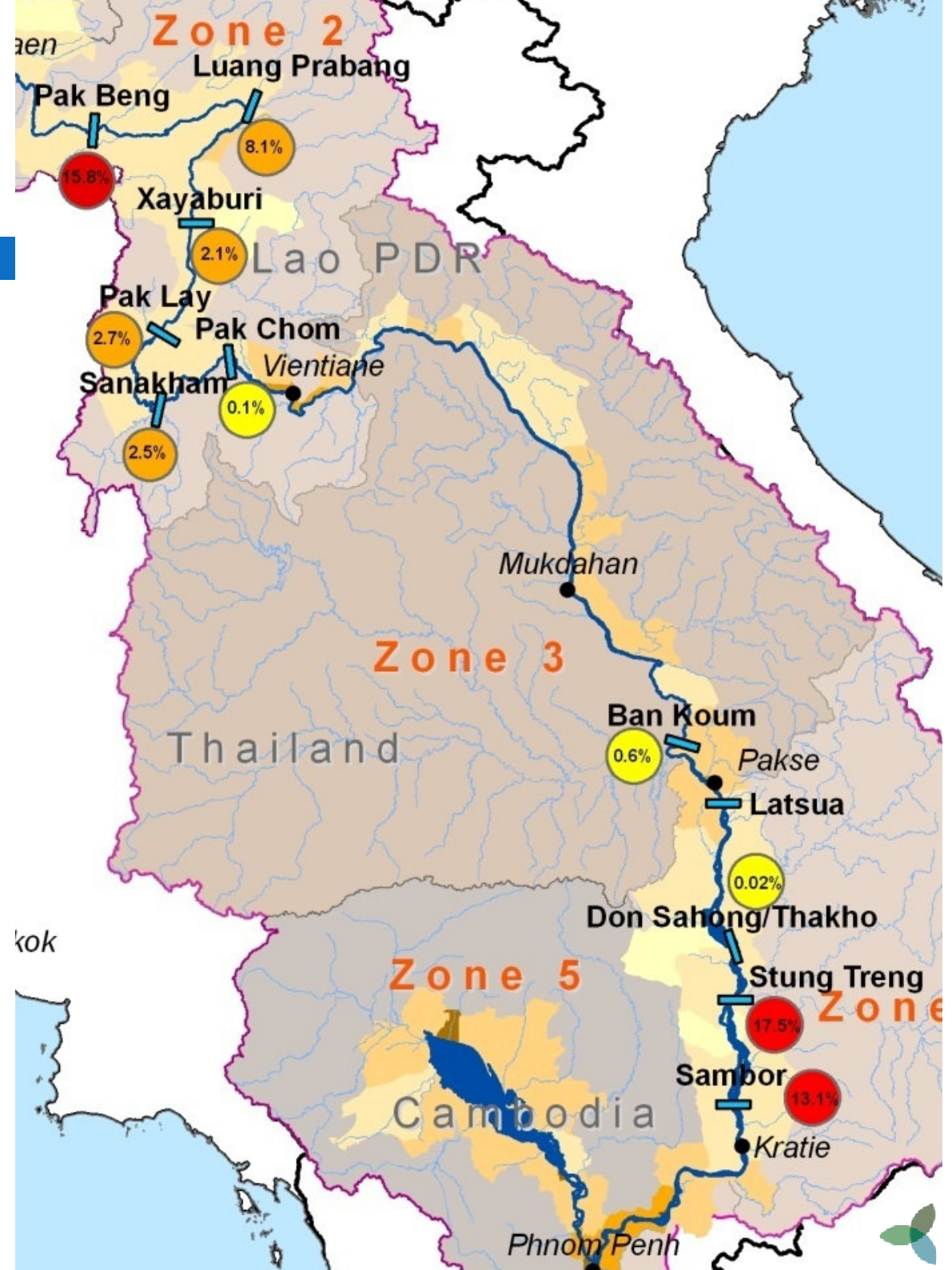
- *Rural and urban communities living within 15 km of the Mekong River would experience greater food insecurity*



# 5. Livelihoods & living cultures

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- significant effects on riparian communities by disrupting their ways of life, cultures and sense of community
- 2.1 million people, ~10% of people living & working within 5 km of the river, are expected to be most at risk:
  - ▣ Direct impacts: 106,942 people
  - ▣ Indirect impacts: 2 million people



# The SEA stakeholders concluded

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## Benefits

1	Lao PDR
2	Cambodia
3	Thailand
4	Vietnam

## Costs

1	Vietnam
2	Thailand
3	Cambodia
4	Lao PDR

All groups:

- ❑ Benefits focused on power & economic themes
- ❑ Risks focused on natural & social systems, particularly fisheries and hydrology & sediment
- ❑ concerned over potential for increased poverty from mainstream development despite recognition of high returns from power sales

Lao group:

- ❑ highest significance on the power benefit,

Viet Nam and Thai groups

- ❑ least significance to power benefit – even though they would consume most of the power



# The SEA team concludes (1/2)

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1. **Globally important river:** The Mekong is one of the few remaining international rivers undammed over most of its length;
2. **Irreversible change:** One dam across the Lower Mekong mainstream commits the river to irrevocable change;
3. **International tensions:** The proposed developments when under construction and operating have the potential to create tensions within the LMB;
4. **Impacts are unavoidable:** Many of the risks associated with the proposed mainstream developments cannot be mitigated at this time – they would represent a permanent and irreversible loss of environmental, social and economic assets;
5. **Weak institutional capacity:** There are many and substantial gaps in institutional and procedural arrangements for ensuring the effective management of construction and operation of the projects;



# The SEA team concludes (2/2)

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6. **Weak regulation:** Critical national capacities in terms of personnel and skills are not yet in place to oversee, control, monitor and enforce benefit sharing and operational rules;
7. **Weak safeguards:** The framework of regional standards and safeguards relating to trans-boundary and downstream effects and institutional arrangements for their enforcement are not fully developed and are not adequate;
8. **Big uncertainties:** There are so many remaining uncertainties and serious risks associated with the developments that more studies are needed to better inform responsible decisions making;
9. **Knowledge gaps:** The state of knowledge about the Mekong is not considered adequate for making an informed decision about mainstream dams at this time;





# Thank you!

□ For SEA documents please visit:

□ [www.icem.com.au](http://www.icem.com.au)

□ [www.mrcmekong.org/ish/SEA](http://www.mrcmekong.org/ish/SEA)

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