

# ABOUT A RIVER: PROFILING THE NAM OU

WLE Forum  
10 November 2016



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## INTRO. & AGENDA

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1. Welcome remarks
2. Overview of the Project (Presentation and film)
3. Process & Results Description
4. Sensemaking (discussion)

# WELCOME REMARKS

KATE LAZARUS

TEAM LEADER, HYDRO E&S ADVISORY, IFC



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# OVERVIEW: NAM OU RIVER BASIN CONTEXT



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## RATIONAL & PURPOSE OF NAM OU RIVER BASIN PROFILE



MONRE's mandate to produce a river basin profile to create a better understanding of the basin characteristics for the purpose of contributing to:

Planning and Management  
of River Basin

# CORE TECHNICAL TEAM (DWR/PONRE/IFC)

## Roles & Responsibilities:

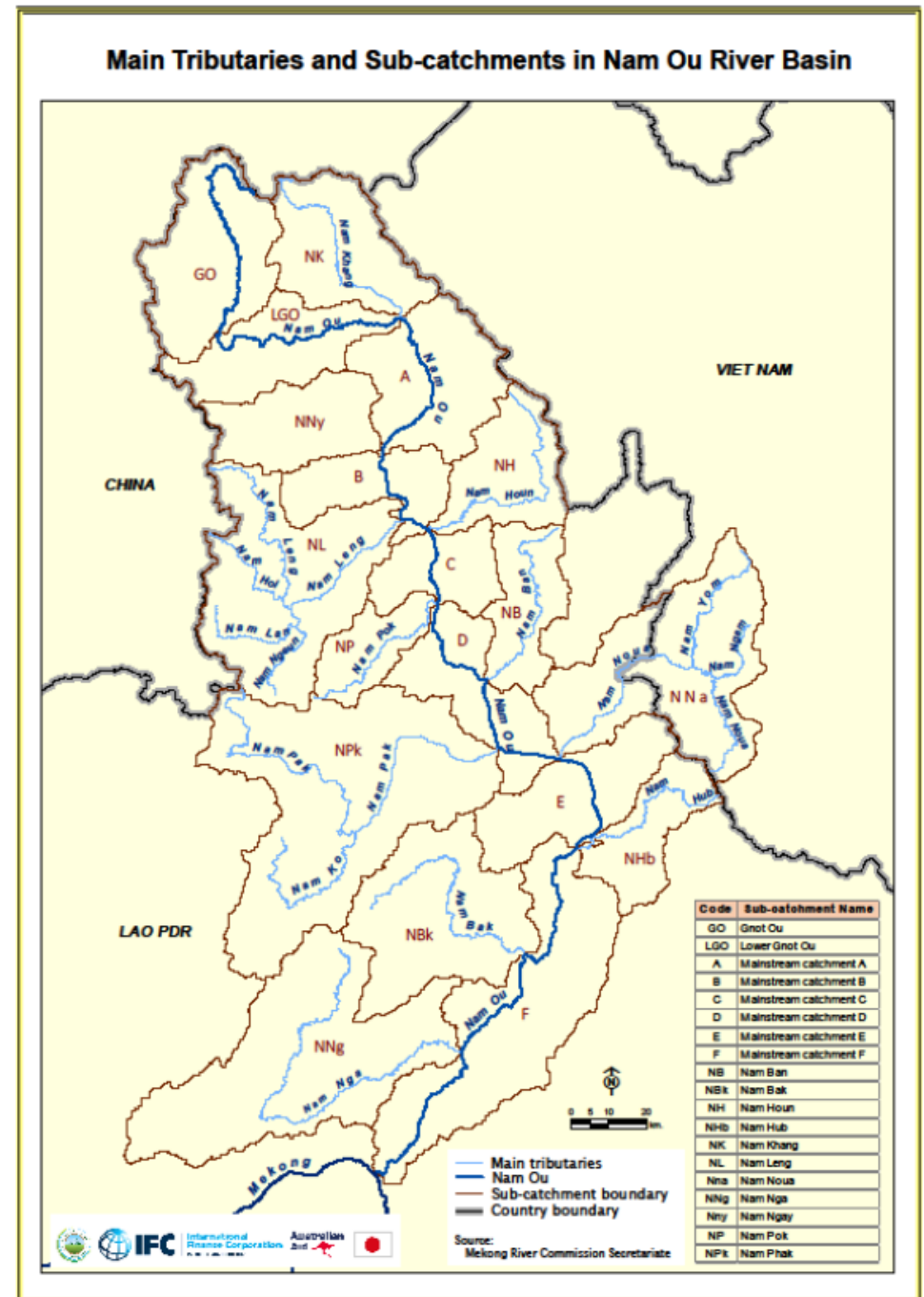
Data collection & analysis

Writing of profile



## A SIGNIFICANT MEKONG TRIBUTARY

- 485 km long from Chinese border to Mekong
- Basin area 25,910 km<sup>2</sup>
- 5.8 % of Nam Ou basin lies in Vietnam
- 7<sup>th</sup> largest tributary, contributing 3.5% of flow of Mekong
- 4.8% of the sediment transport to the Mekong
- 4<sup>th</sup> most important tributary in Lao for hydropower potential – 1,272 MW.
- Cascade of 7 large HPP, of which 3 have been constructed



## POPULATION AND ADMINISTRATION

### Three Provinces of Lao

- ✓ Phongsaly – 7 districts
- ✓ Oudomxay – 6 districts
- ✓ Luangprabang – 4 districts

And Dien Bien Phu in Vietnam

Just under half of the pop. of the three northern provinces live within the Nam Ou River Basin.

Phongsaly has the largest population, also the largest proportion.

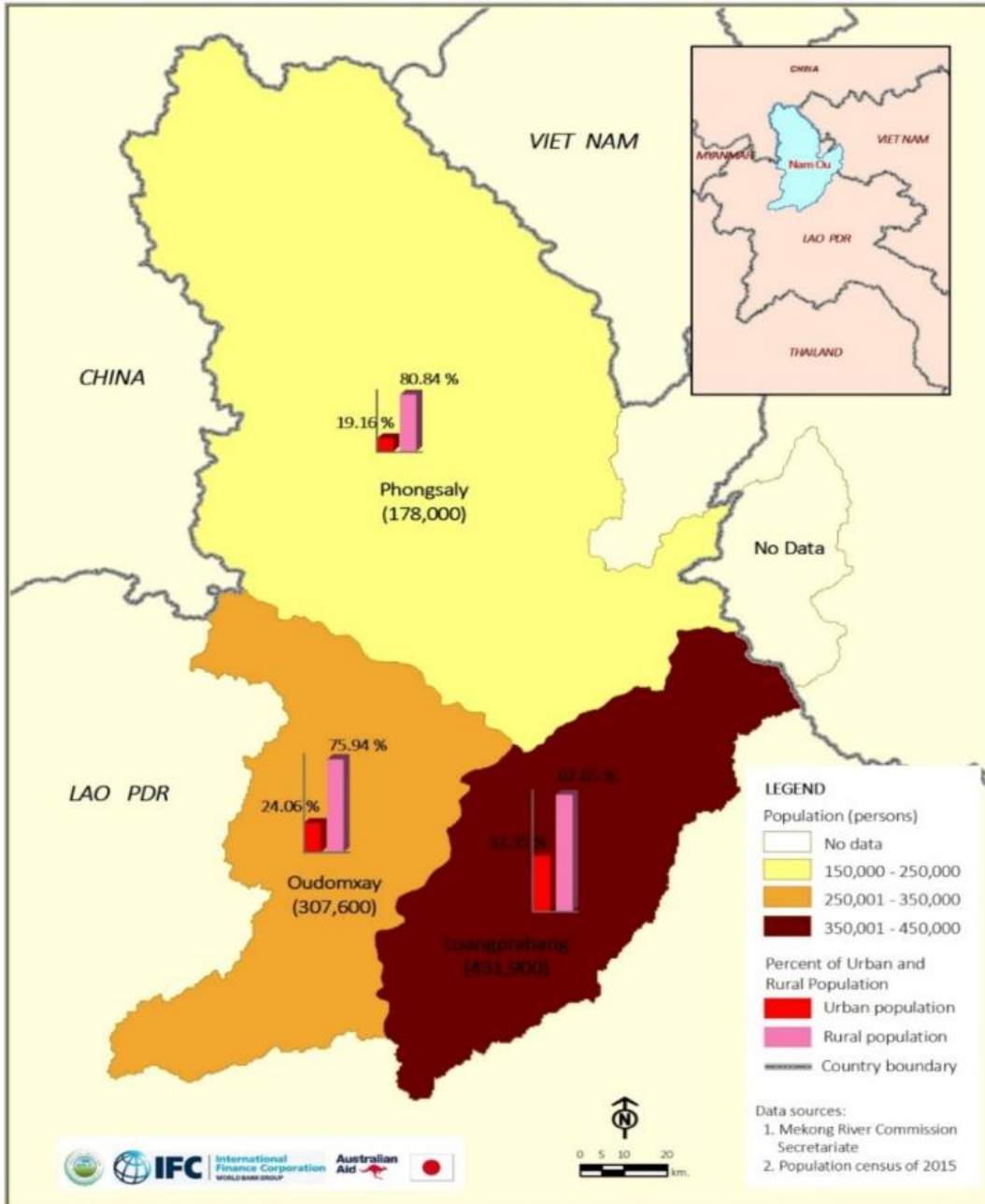
### Ethnicity: Culturally diverse:

- ✓ Akha accounted for the largest percent in Phongsaly.
- ✓ Khmu is the largest population in Oudomxay, followed by Hmong.
- ✓ Khmu is the largest population in Luangprabang followed by Lao.

Province	Population		
	Total	Within NRB	Percentage
Luangprabang	338,798	112,505	33.2%
Oudomxay	270,909	92,868	34.3%
Phongsaly	157,266	150,270	95.6%
Total	766,973	355,643	46.4%



## Population by Province



## URBAN VERSUS RURAL POPULATION

- Close to 75% of people in the three Nam Ou River Basin provinces live in rural areas.
- On average, 15% of the rural people in the Nam Ou River Basin do not have road access.
- Phongsaly has the greatest proportion of the population without road access at just over 21%.

Source: *Population and Housing Census 2015*

# OVERVIEW OF NAM OU RIVER BASIN PROFILE PROCESS & METHODOLOGY (FILM)



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# Q&A SESSION



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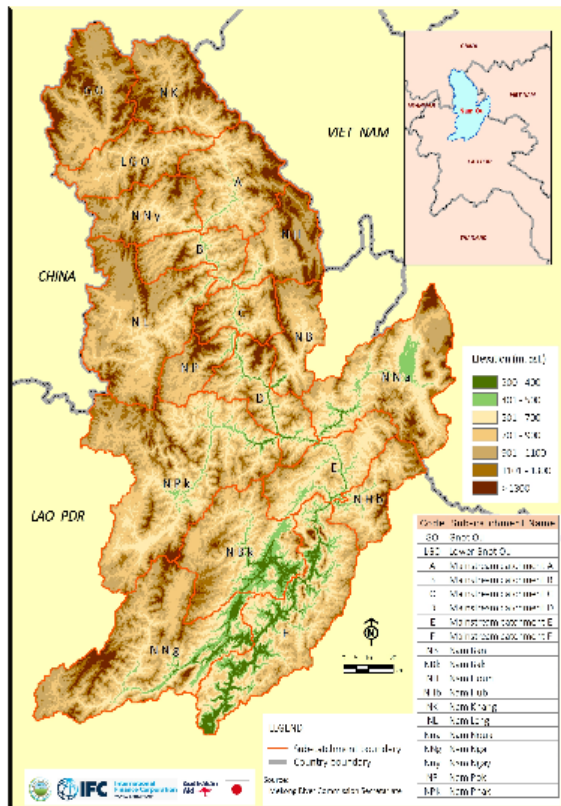
# BIOPHYSICAL PROFILE



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Elevation in Nam Ou River Basin

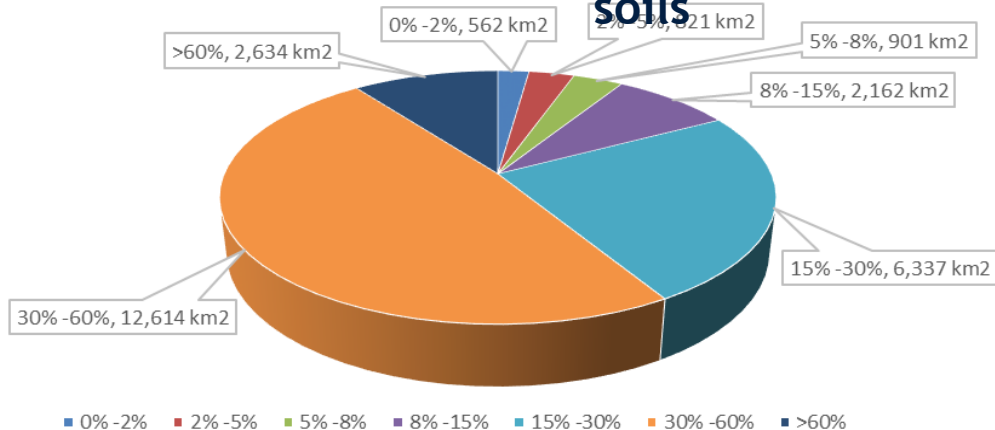


## NAM OU IS AN UPLAND RIVER WITH STEEP SLOPES AND POOR SOILS – NOT VERY PRODUCTIVE

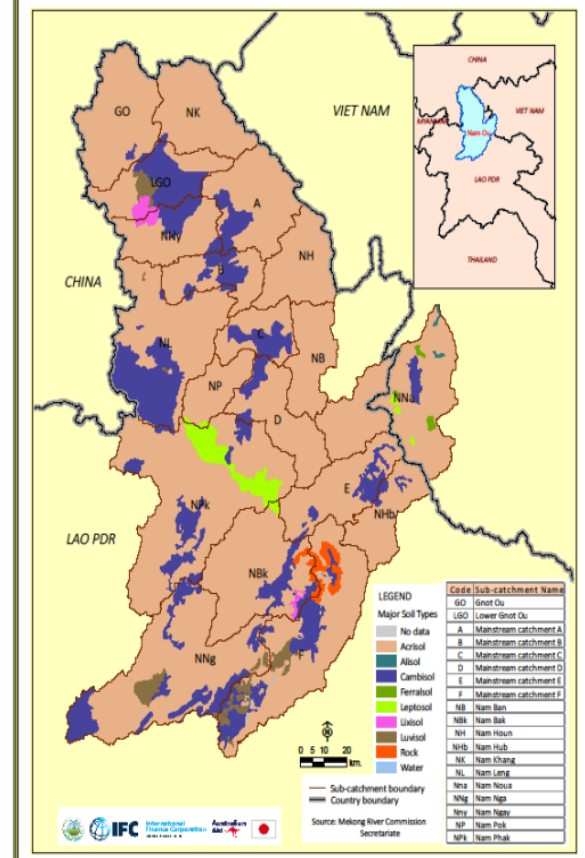
- Highest point - 2,200 masl - Nam Noua in Vietnam
- Lowest point - below 300 masl at Pak Ou
- 50% of the basin lies between 700 - 1,100 masl
- ❖ About 72% of basin is Steep or Medium steep 15 - 60 % slope
- ❖ Only 2.2% of basin is flat
- ❑ Soils predominantly Acrisols - rather poor soils

❑ Some Cambisols - richer soils

Slope classes of the Nam Ou River Basin



Major Soil Types in Nam Ou River Basin

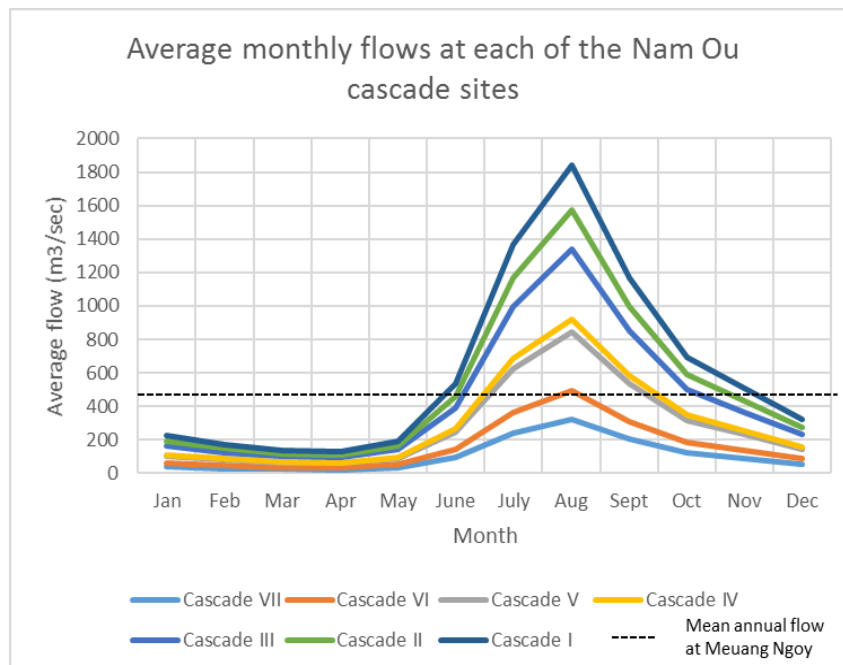
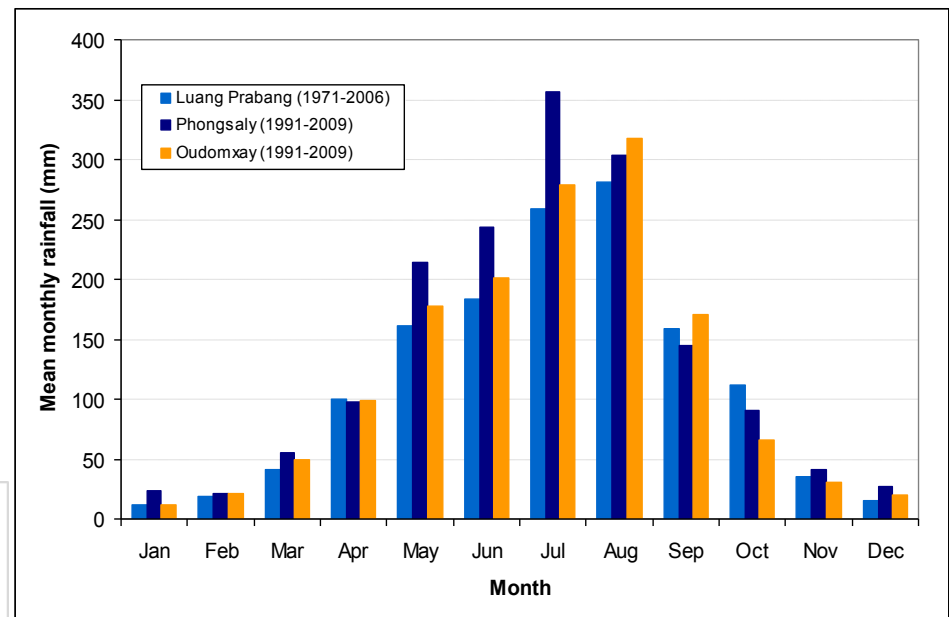


# WATER RESOURCES ARE IMPORTANT - RAINFALL AND FLOWS

## Average annual rainfall

- Louangprabang 1,377 mm/yr
- Phongsaly – 1,618 mm/yr
- Oudomxay – 1,444 mm/yr

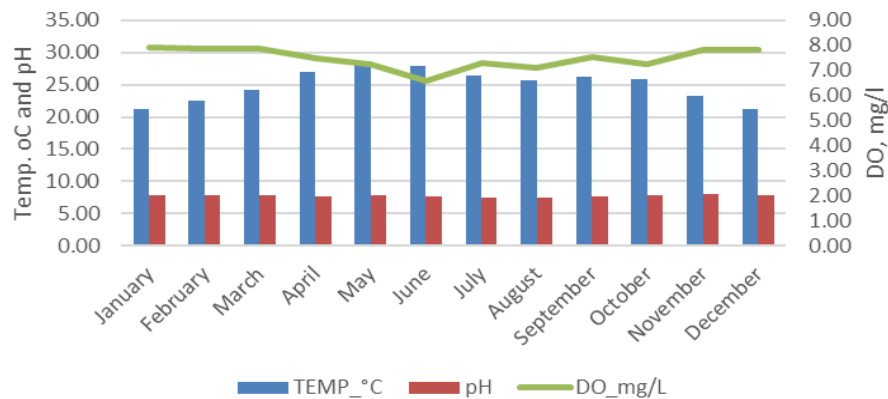
**84% of annual rainfall falls in wet season**



**Mean annual flow at Meuang Ngoy is 440 cu.m/sec.**

# WATER QUALITY – GENERALLY GOOD BUT MAYBE DECLINING

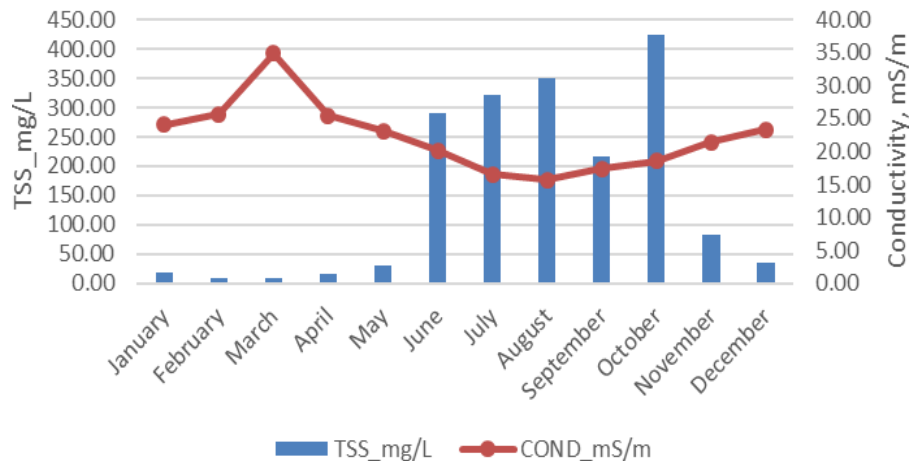
Mean monthly water quality measurements at Ban Hatkham, Pak Ou



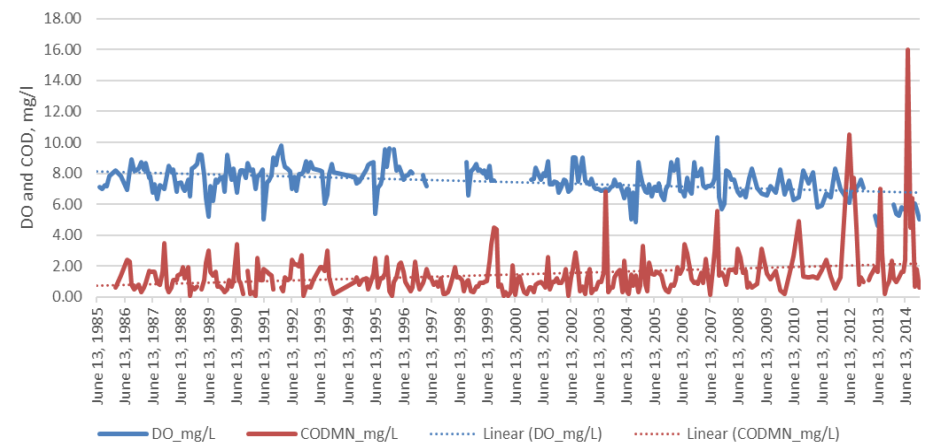
- MRC data at Ban Hatkham going back to 1985
- Trends showing slight decrease in DO and increase in COD, especially recently

❖ Sediment transport rate at Nam Ou 1 HPP site estimated at 6.69 M t/yr

Mean monthly TSS and conductivity for Ban Hatkham

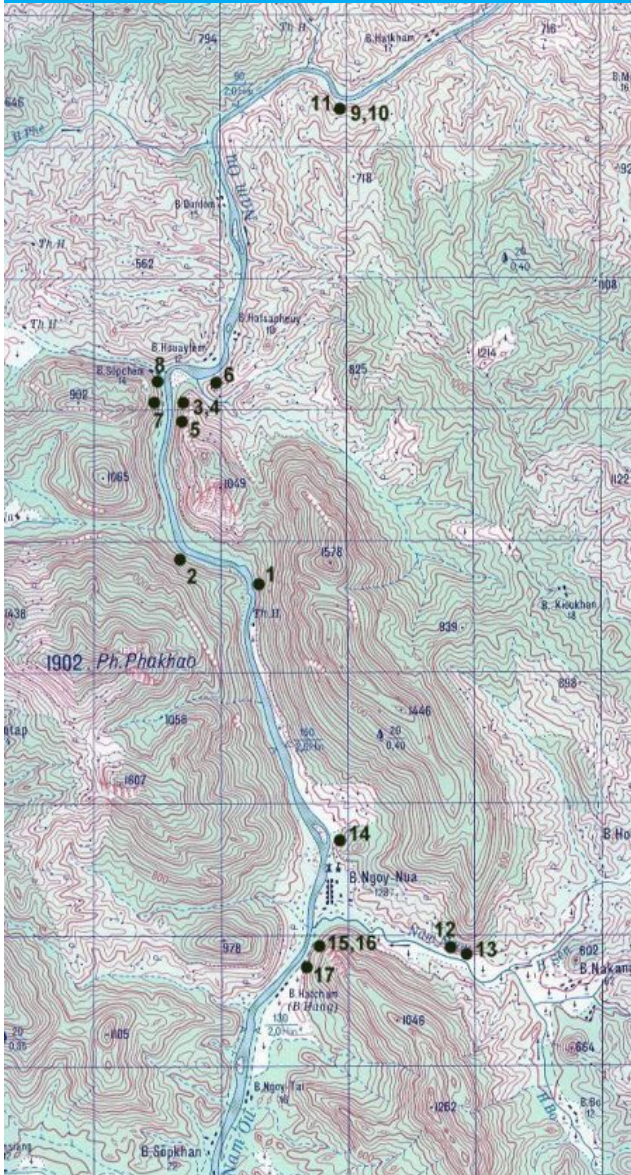


Variation in Dissolved oxygen and COD since 1985





## SWEET SPOTS – CAVES, HOT SPRINGS AND WETLANDS



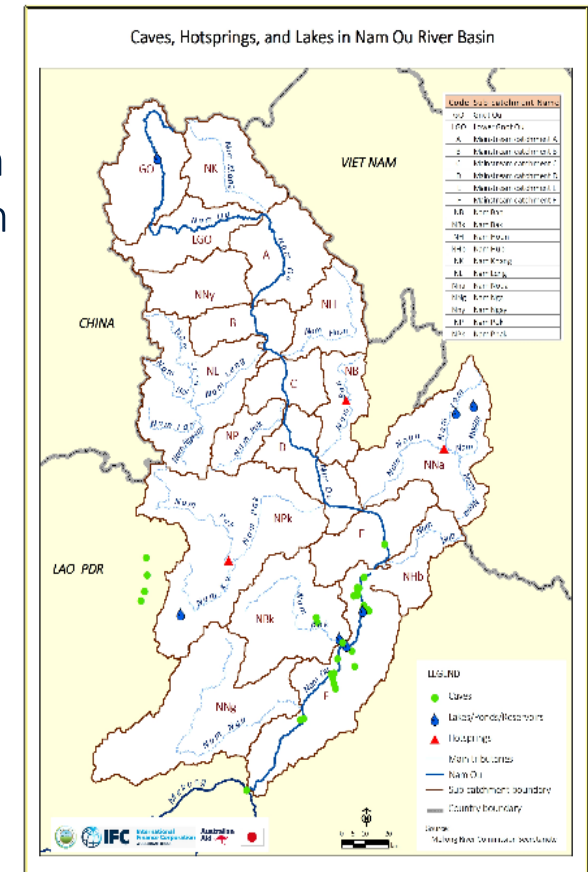
## Three areas of hotspots

- Meuang La on Nam Phak
- Ban Ta Liao on the Nam Ban
- Uva springs on Nam Noua in Vietnam

Famous Karst limestone landscape and caves especially in Meuang Ngoi

## Lakes and ponds

- Nong Ngay in Gnot Ou
- Nong Khiaw
- Nong Bia
- Pha Khoang Lake and Huoi Pha Lake in Vietnam
- Nam Hin reservoir in Oudomxay

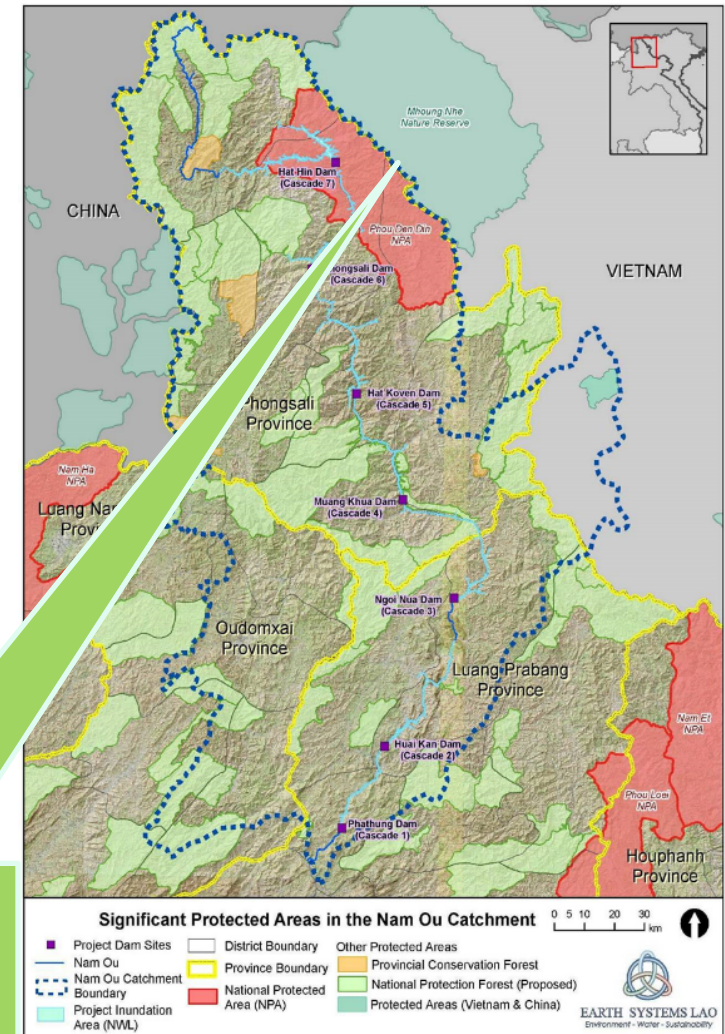
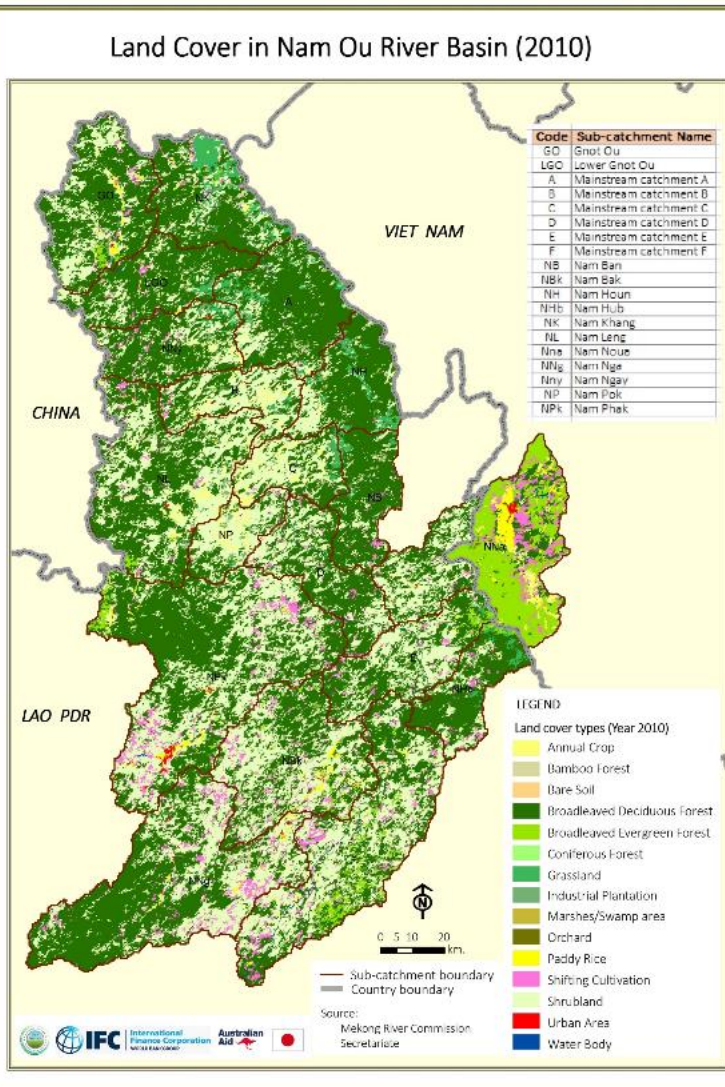




# LAND COVER AND PROTECTED AREAS – 52% BROAD LEAVED DECIDUOUS FOREST AND 34% OF SHRUBLAND

Protected areas and protection forests are important to protect forest cover to prevent soil erosion and maintain biodiversity

Phou Den Din NPA covers 222,000 ha, about 8.6% of the Nam Ou river basin



# VILLAGERS DISCUSS FISH SPECIES (**ONE OFF DISCUSSION**)



139 fish species recorded in Nam Ou

- 35 are endemic to the Mekong basin, 86 are native and 5 are exotics.
- Villagers in 8 villages recognised 125 species

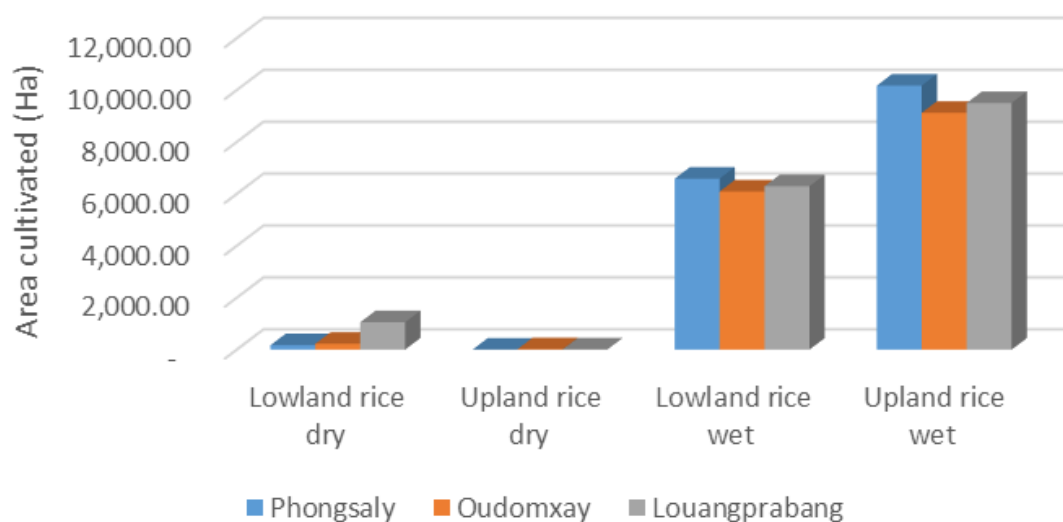
- Villagers in Ban Phoumouang previously caught about 47 species in the river
- Since moving to resettlement village, they now catch 8 species in reservoir
- Most common include exotic species, Common Carp and Tilapia.



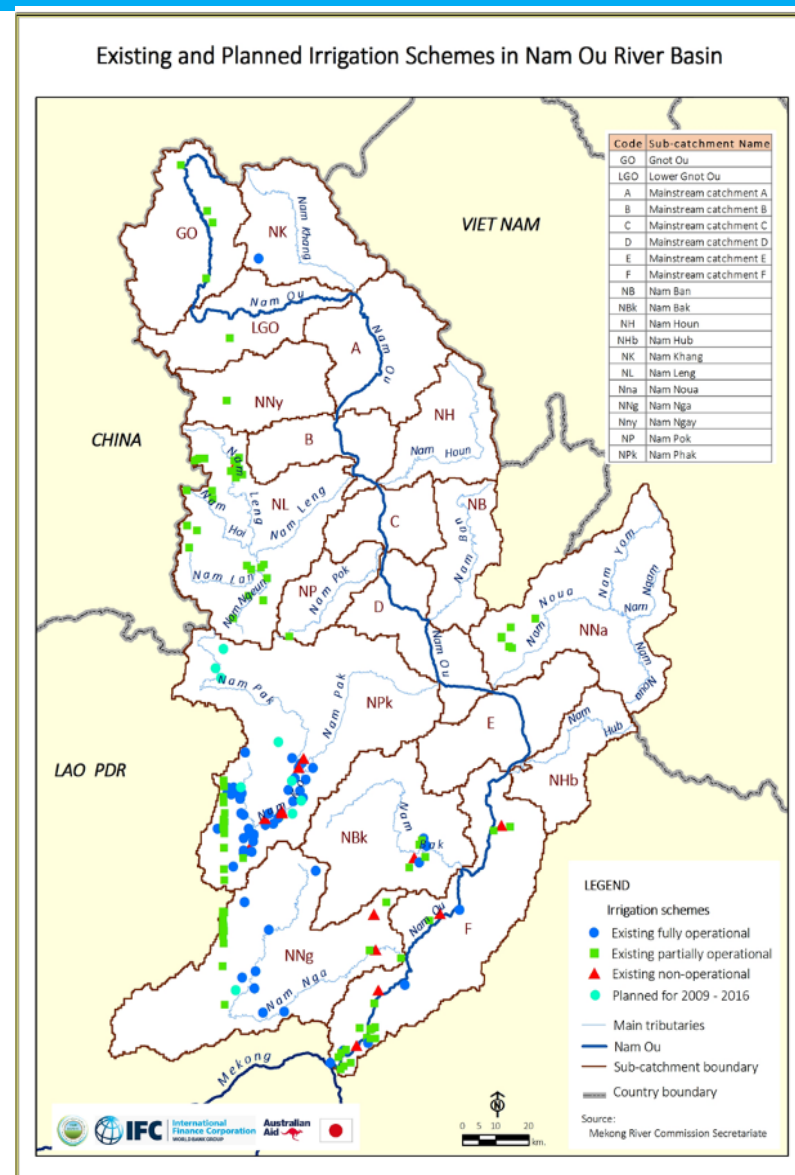


# AGRICULTURE AND IRRIGATION

Areas of lowland and upland rice cultivation in dry and wet seasons in Nam Ou River Basin



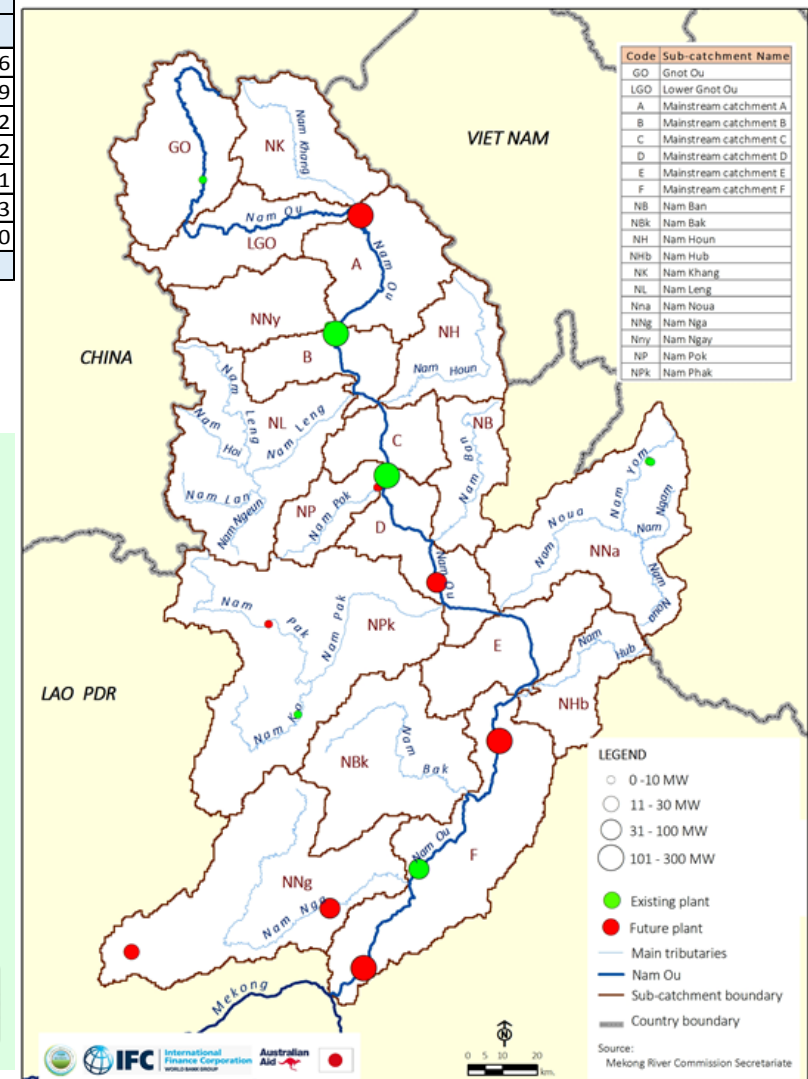
- 172 existing irrigation schemes on flatter land
- 6,339 ha of wet season irrigation
- 3,347 ha of dry season irrigation



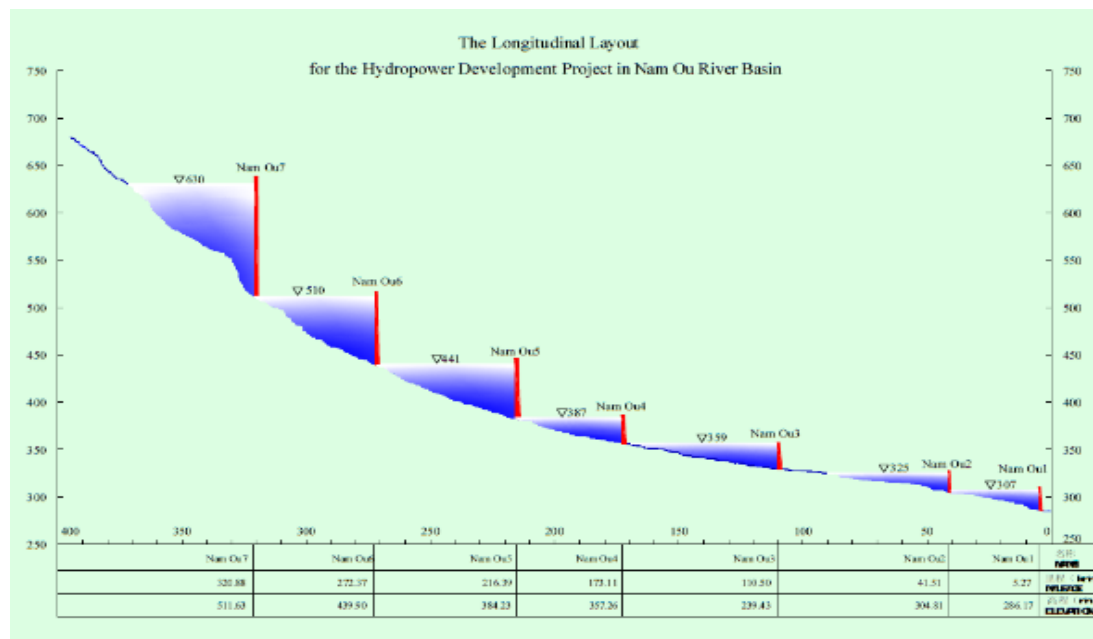
# MAINSTREAM HYDROPOWER DEVELOPMENT – 7 DAMS IN CASCADE – 1,272 MW

Cascade	Type	FSL (masl)	MOL (masl)	Regulating storage capacity (Mm <sup>3</sup> )	Installed capacity (MW)	Annual average energy (GWh)	Annual utilization hours (h)
1	Concrete Gate Dam	307	305	22	180	710	3,946
2	Concrete Gate Dam	325	323	25	120	448	4,029
3	Concrete Gate Dam	360	358	24	210	826	3,932
4	Concrete Gate Dam	386	384	16	132	519	3,932
5	Concrete Gravity Dam	441	430	142	240	977	4,071
6	Geomembrane Rock Fill Dam	510	490	246	180	726	4,033
7	Concrete Rock Fill Dam	635	600	1,060	210	838	3,990
<b>TOTAL</b>				<b>1,536</b>	<b>1,272</b>	<b>5,044</b>	

Hydropower Projects in Nam Ou River Basin

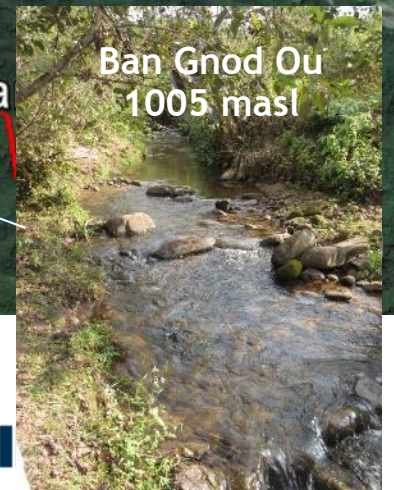
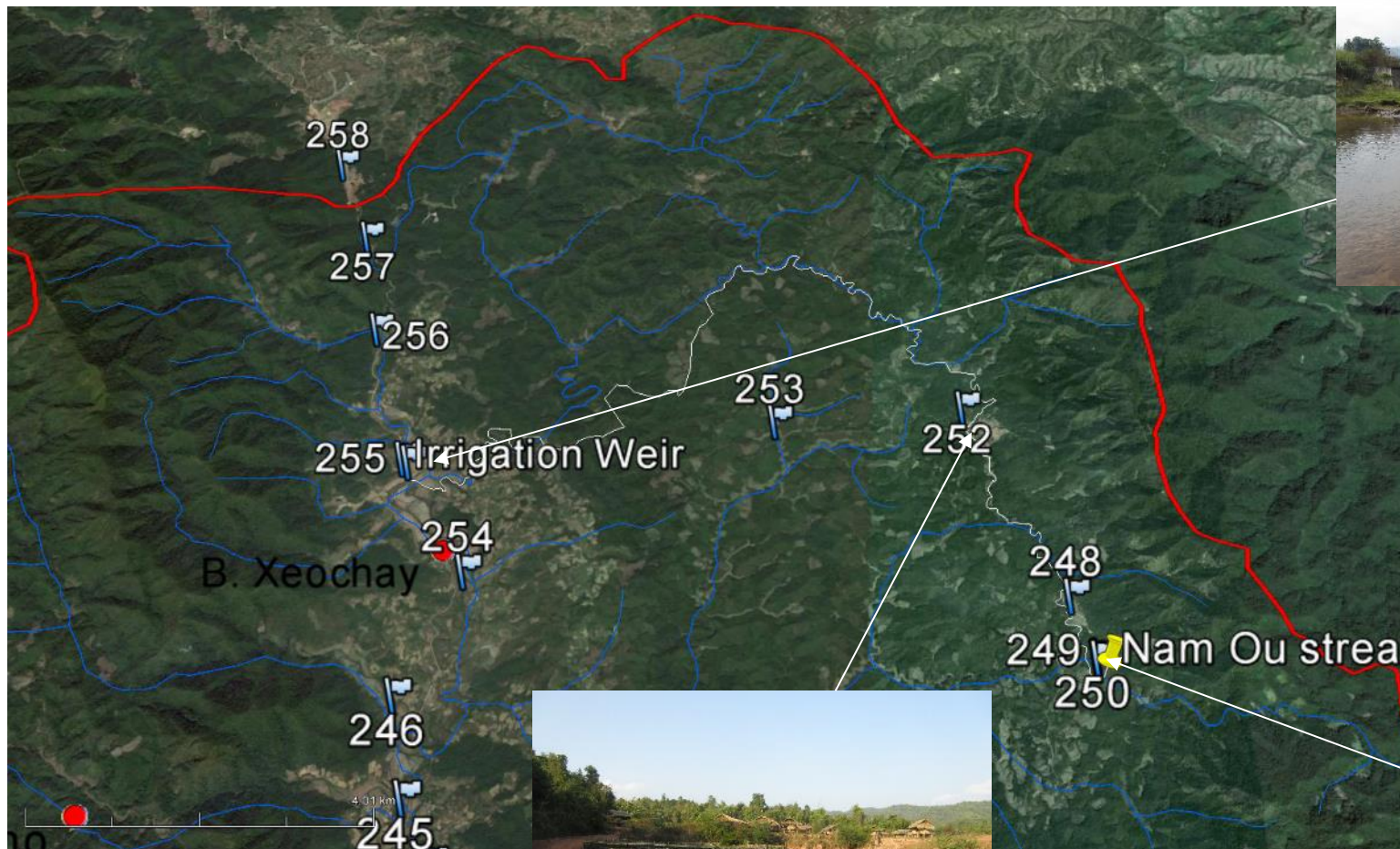


Nam Ou 2, 5 and 6 completed in 2016





## SOURCE OF NAM OU IS IN LAO PDR ON BORDER WITH CHINA



# Q&A SESSION

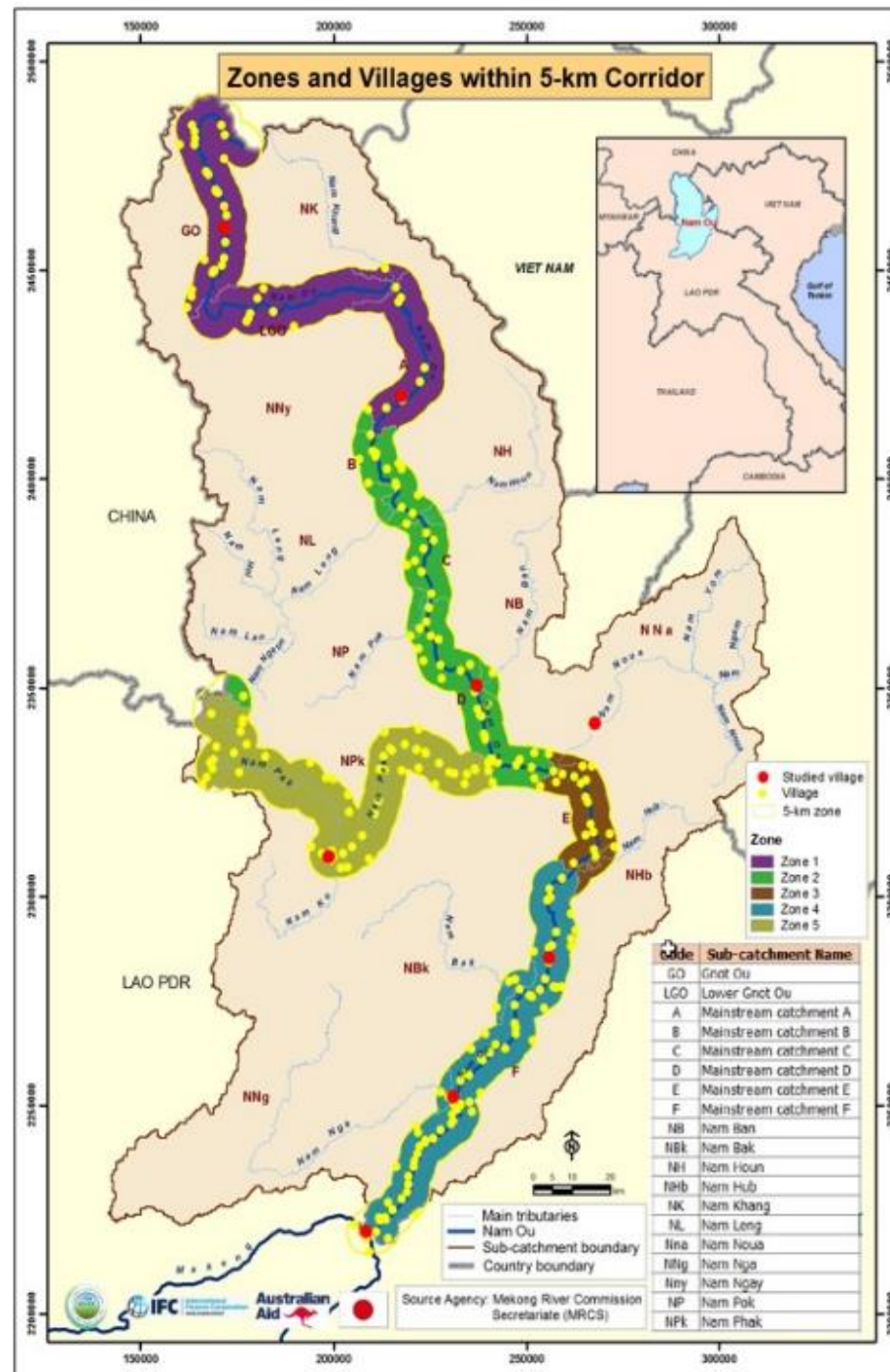


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November 11, 2016







# SOCIO-ECONOMIC PROFILE

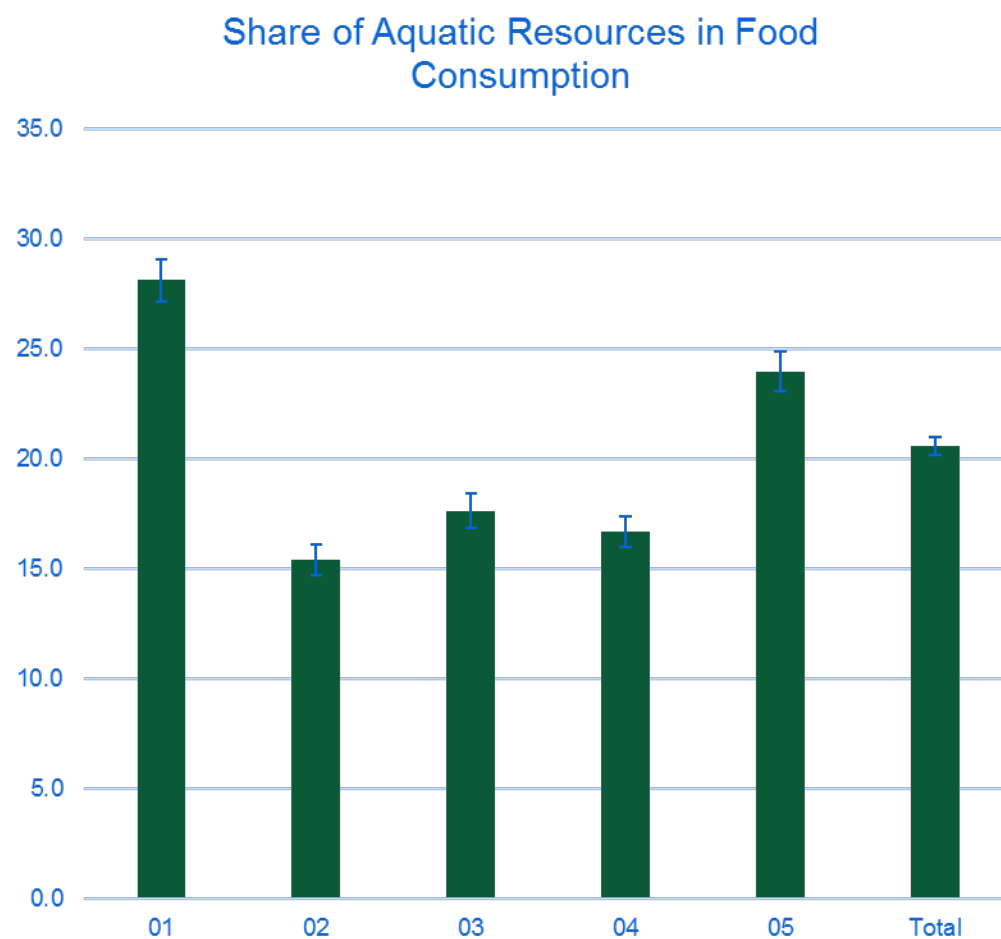


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# HIGH DEPENDENCY ON AQUATIC RESOURCES



*Source: Household Survey 2016*

## HIGH DEPENDENCY ON FISHING FOR LIVELIHOODS

Zone	%age of HHs fishing in the last 12 months
1	90.7%
2	78.5%
3	79.0%
4	55.7%
5	62.2%



*Source: Household Survey 2016*

## LOW DEPENDENCY ON WATER RESOURCES FOR CASH INCOME, WITH EXCEPTION IN CERTAIN AREAS.

Zone	Share of cash income from aquatic resources
1	13.0%
2	7.0%
3	3.4%
4	8.8%
5	24.3%
Total	6.8%

➤ Overall, share of cash income from aquatic resources is not as high as food.

➤ But by zone, changes in water resources can severely affect cash income in Zone 5, followed by Zone 1.

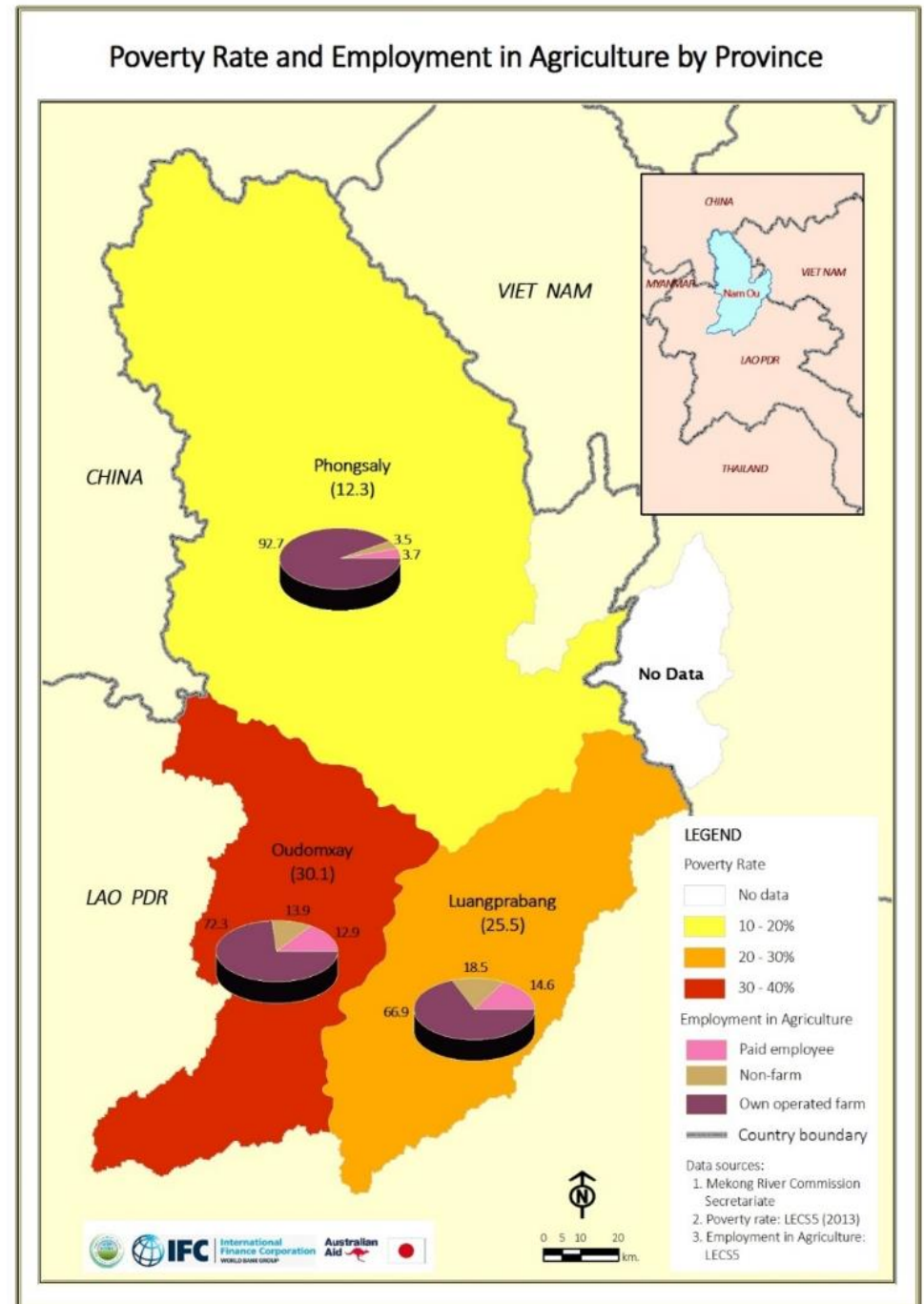


*Source: Household Survey 2016*



# POVERTY AND DEPENDENCY ON AGRICULTURE

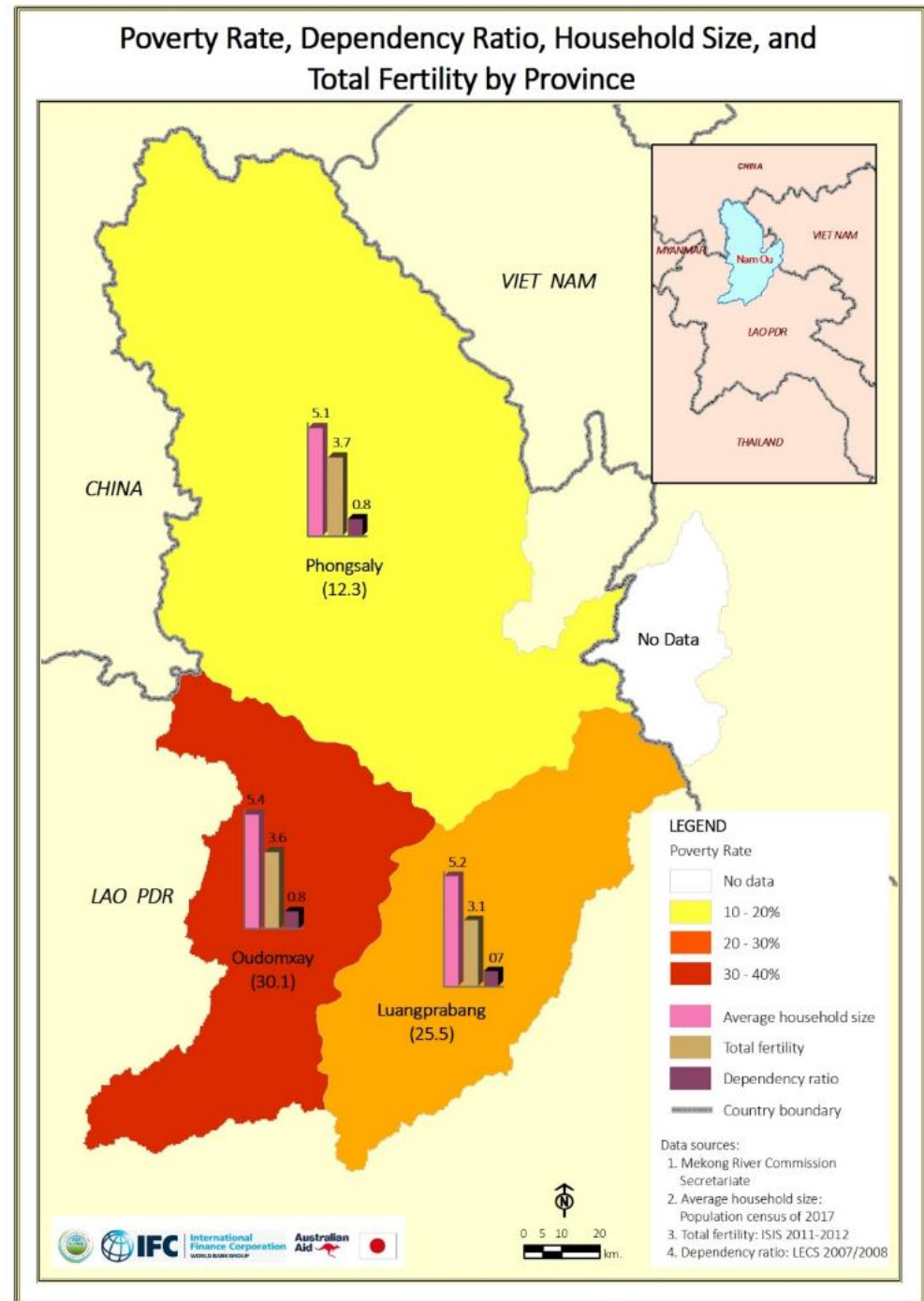
Dependency on own operated farms is high in all provinces, with the highest proportion in Phongsaly.



# FERTILITY AND DEPENDENCY RATIOS

The population in  
Phongsaly has:

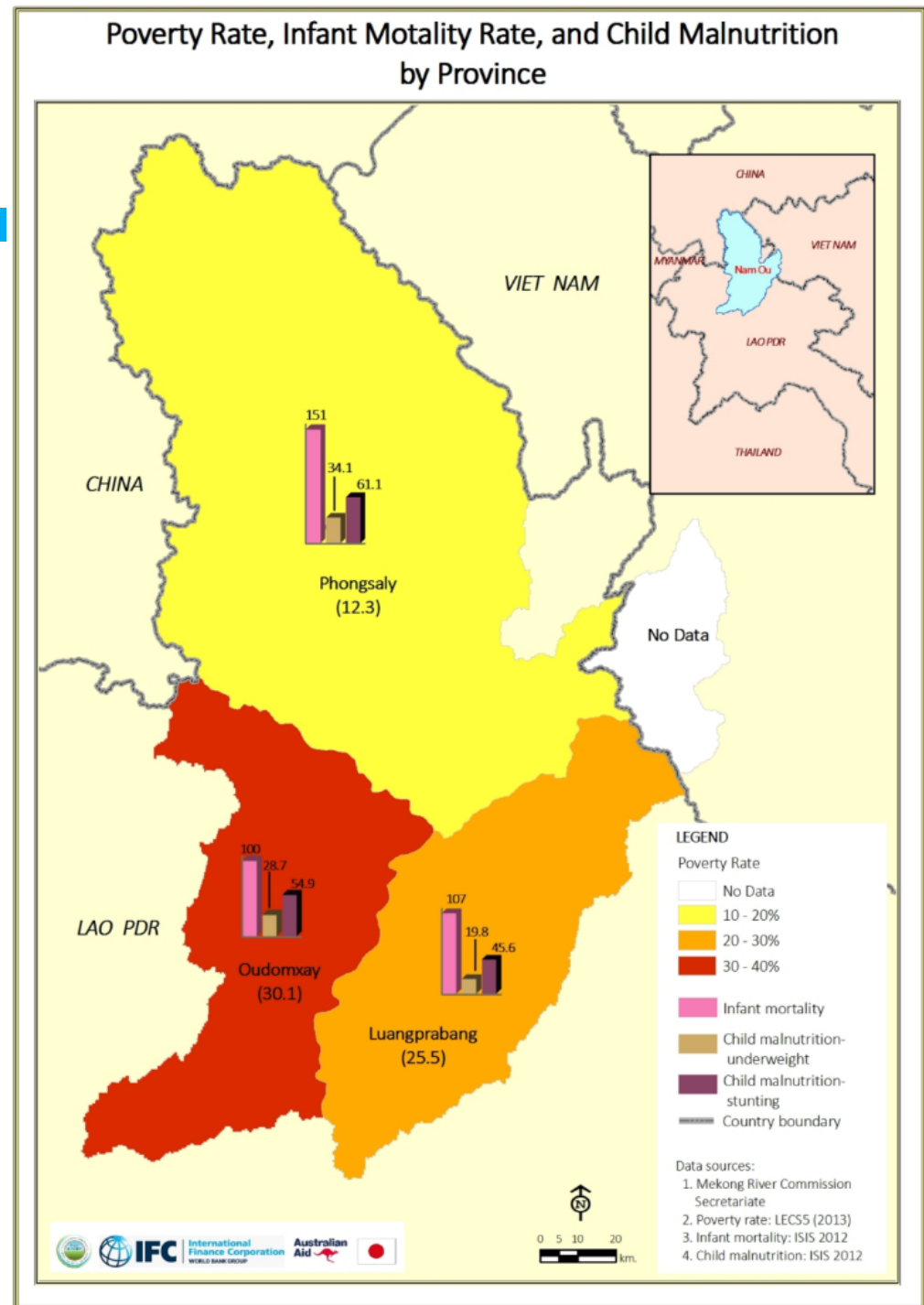
- the highest total fertility rate.
- the highest dependency ratio.



# CHILD MALNUTRITION AND INFANT MORTALITY

The population in  
Phongsaly has:

- the highest child malnutrition rate.
- the highest infant mortality rate.



# KEY MESSAGES

Certain areas are:

- Low resilient: e.g. high dependency ratio, fertility, child malnutrition, etc.
- Highly dependent on water resources for food and cash income.
- Highly vulnerable to declining in the availability of water resources.

*Such vulnerabilities should be concerned and addressed in river basin planning and management processes.*





# Q&A SESSION



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# SENSEMAKING

## Group Discussion



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## **GROUP 1: FOCUSING ON RIVER BASIN PLANNING AND MANAGEMENT**

1. How can the profile be used for River Basin Management and Planning? If not, how can this be improved?
2. How can this approach (process & methodology) be replicated in another basin?
3. How can this profile be useful for different stakeholders in the Basin?

## **GROUP 2: FOCUSING ON COMMUNITY WATER RESOURCE MANAGEMENT**

1. How can the profile be used for managing water resources at community level? If not, how can this be improved?
2. How can this approach (process & methodology) be useful for the community based water resources management, if not, what is your recommendation?

# KEY TIMELINE & NEXT STEPS



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## PROJECT TIMELINE

Time Period	Activity
Sept 2015	Concepts and sampling design agreed by Core Team
Oct-Nov 2015	Questionnaire development and improvement
Dec 2015	Training to enumerators and testing of questionnaire in Oudomxay
Jan-Feb 2016	Fieldwork in five zones (HH Survey & Case studies)
Feb-Mar 2016	Data entry and cleaning
April-Nov. 2016	Data analysis and Writing
Nov. 2016	Production of 1 <sup>st</sup> Draft Profile Report
Dec. 2016	Basin Stakeholder consultation & validation workshops on 1 <sup>st</sup> Draft Profile Report
April. 2017	Forum to launch the Profile

