



Field Observation & Analysis Work of
IIEPF in the
Nam Houm Irrigation Project

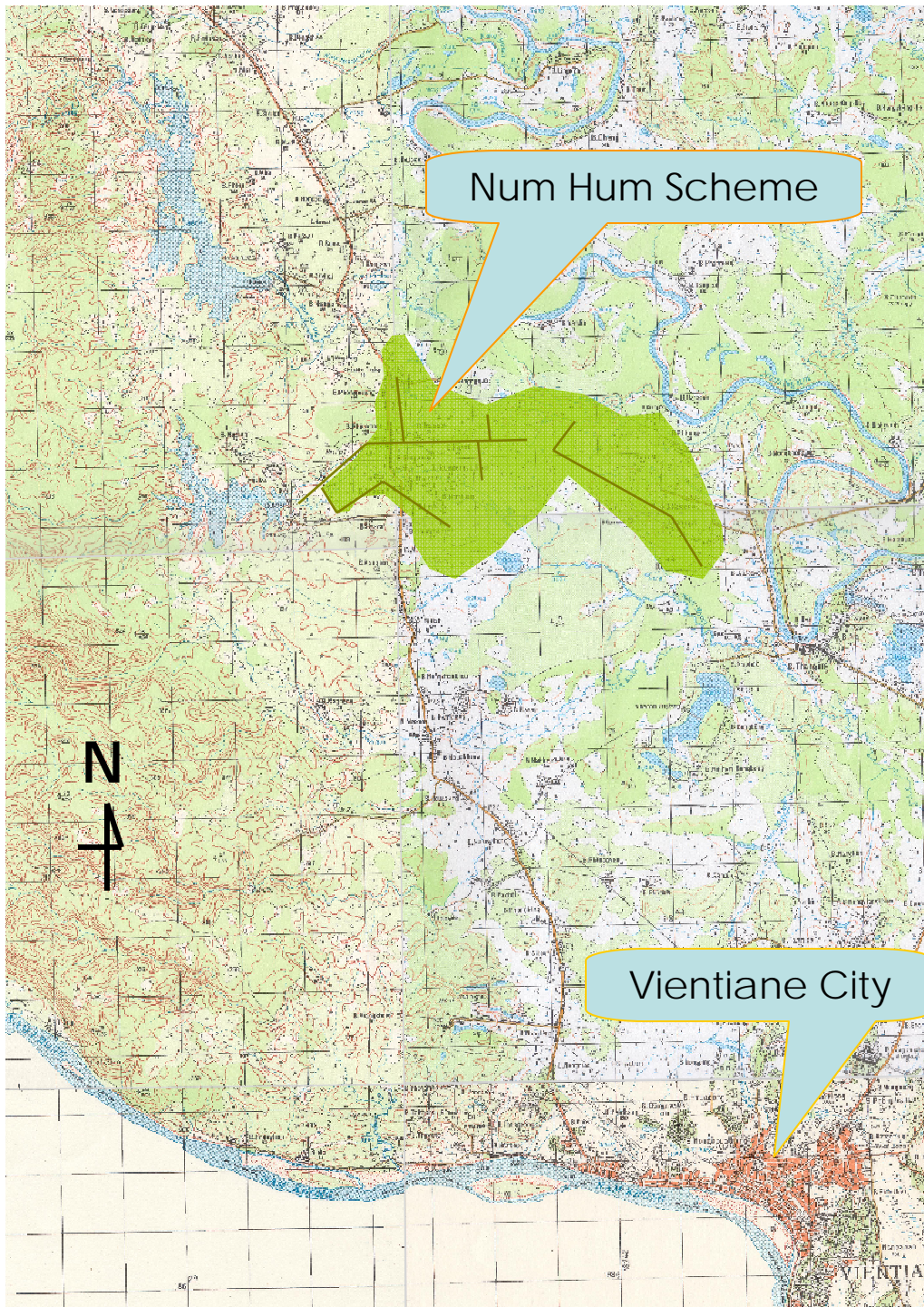
2nd IIEPF Regional Workshop
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1. Location

- Located in Vientiane Capital
- 35 Km from Vientiane Capital City by road No. 13 to the north
- Project areas cover two districts:
 - Naxaythong District
 - Xaythany District

2. Scheme Outline

Constructed in 3 phases:



Phase 1 : 1978 - 82

The construction works included: Dam, intake, spillway, main canal, and some on - farm canals (irrigated 150 ha) by govt. budget with loan from OPEC & grand aid from Japanese govt.

Phase 2 : 1990 - 93

N1 secondary canal (400 ha) with financial assistance from Italian govt. through interim Mekong Committee.

Phase 3 : 1997- 2000

Additional main canal (2.3 km) , secondary and the remaining canals (completed 3000ha) by govt budget.

2. Scheme Outline (1)

Project Type:

Gravity Basin Irrigation

Scheme Overall Objective:

Generating household income surrounding Vientiane capital and supporting & promoting agricultural industrialization with irrigation service

Scheme Specific Objective:

Mainly supply water for dry-season agricultural activities & supplementary supply water for wet-season agriculture, but not supply water for domestic & other water uses

2. Scheme Outline (2)

Project Major Duties:

- Reservoir Watershed Management
- Irrigation Infrastructure Operation and Maintenance
- Irrigation Water Delivery Service & Management

Benefit Area :

- Original Designed Command Area : 2,400 ha
- Dry Season (2006-07) : 1,525.7 ha
- Wet Season (2007) : 2,263.2 ha

Benefit People:

- 17 Villages
- 18, 879 farmers

2. Scheme Outline (3)

Storage Capacity

Maximum Storage : 60 MCM

Active storage : 54 MCM

Canals : 60.635 km

MC : 9.30 km

SC : 46.84 km

TC : 4.50 km (367 gates + check structures)



- Unstable rainfall ----> shortage water in some years (1995 & 2005, 2007)
- Strict water management needed

2 July 19, 2007

Vientiane Times

Nam Houm reservoir abnormally low

□ KHONESAVANH LATSAPHAO

THE Nam Houm reservoir in Naxaithong district, Vientiane is abnormally low this year, because there has not been the usual amount of rain.

Normally, the volume of the water is 60 million cubic metres at this time of year, the Deputy Head of Agriculture and Forestry Extension in Naxaithong district, Mr Nantha Phandavong said.

“This is the first time that the volume of water has fallen to 44

million cubic metres,” he said.

This year the rain has arrived so late that rivers and waterfalls are also affected and show lower levels of water than usual for this time of year.

However, the reservoir still supplies water to over 100 hectares of wet-season rice fields through the irrigation system.

If the level of water remains at 44 cubic metres until the dry season the reservoir will not have enough water to provide rice fields.

All farmers in the area of the

Nam Houm irrigation system will use water from these channels to supply their dry-season rice fields.

Nam Houm reservoir is about 26 km from Vientiane, and is a popular place for locals and foreigners to have picnics.

Many people like to visit this area on Saturday and Sunday, because the reservoir has a waterfall called Tad Houm. But now only a few people go there, because of the lack of water feeding the waterfall, Mr Nantha said.

3. Field Activities

Major Field Activities:

- Conducting RAP as first system performance assessment
- Identifying cropping pattern
- Monitoring ETo, ETc, Percolation, rainfall ----> water requirement
- Flow measurement in & out of system & inside system -----> water balance
- Conveyance efficiency test
- Crop production survey
- Overall command area efficiency
- Water productivity
- Identifying management appraisal

Not all activities presented

3. Field Activities & Its Results (1)

Irrigation days & Cropping Pattern

- 90 days of dry-season rice & 120 days of wet-season rice
- Cash crops mainly grown in dry season & beginning of wet season (not heavy rain period)
- Fish farming practiced throughout the year
- Irrigation in wet season mainly in Land preparation & Transplanting periods

Agriculture Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
Paddy	DS Paddy							WS Paddy					
Cash Crops	DS Cash crops						WS Cash crops						
Aquaculture	Fish farming												
Irrigation days	128 days						65 days						10

3. Field Activities & Its Results (2)

Flow Monitoring:

- Construction of Bamboo bridges at all measurement points
- Every 15 days (7 days spending for each measurement)
- 2 measurement teams
- Total 44 points (5 natural inflow streams, 4 natural outflow streams)
- 7 places of conveyance tests



3. Field Activities & Its Results (3)

Summary of Total Flows

Original Design Capacity

46.6 MCM (6 m³/s)

In flow from main canal into system

27.33 MCM

7.31 MCM

Inflow from natural stream into system

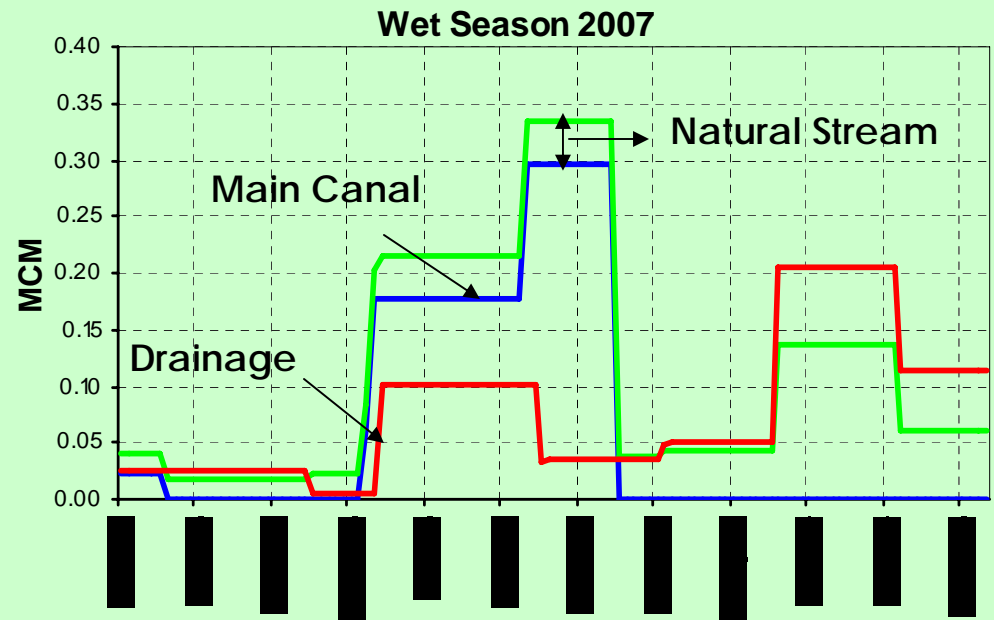
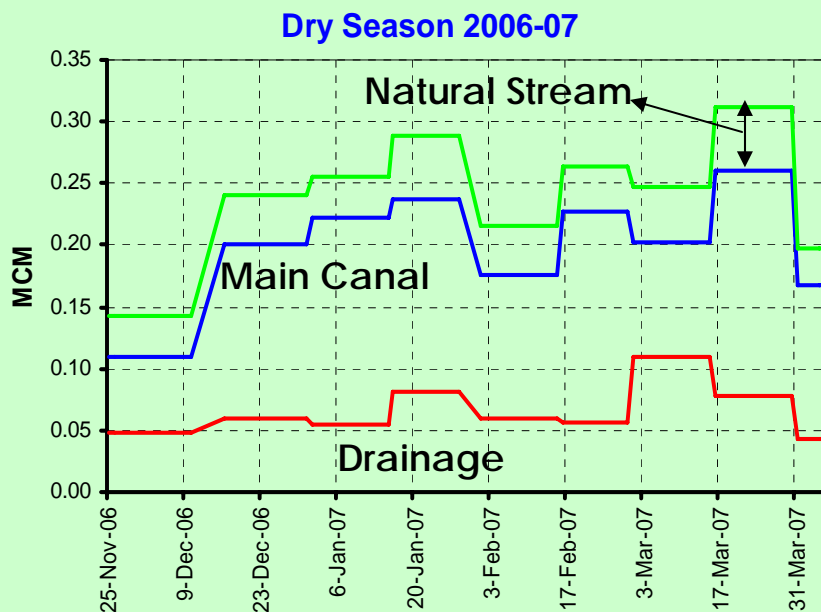
5.59 MCM

12.21 MCM

Drainage (outflows)

9.16 MCM

16.12 MCM



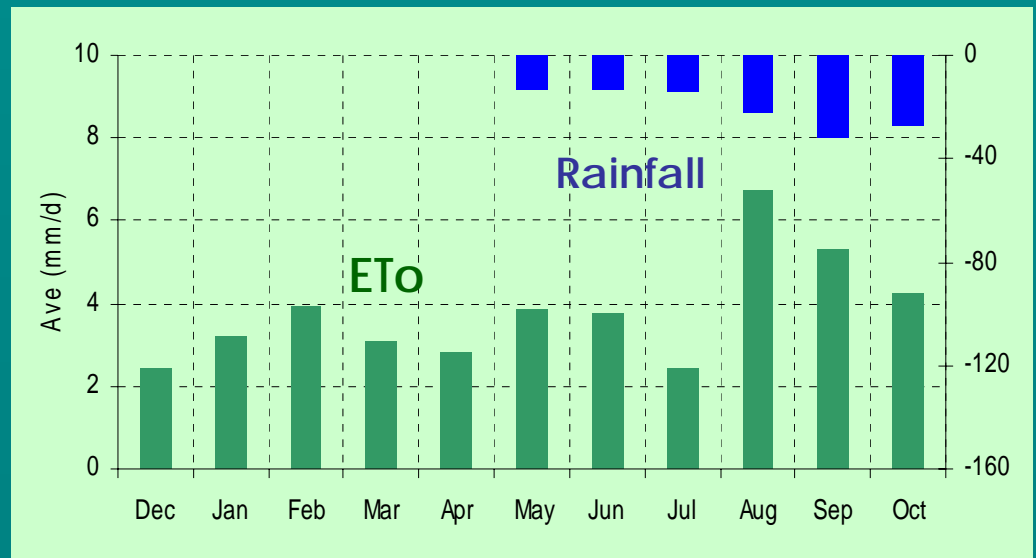
3. Field Activities & Its Results (4)

ET_o & Rainfall

- Daily measurement
- No rainfall in dry season (Dec- April)
- High rainfall in Aug & Sep
- **Dry Season:** High ET_o in Feb.
- **Wet Season:** High ET_o in Aug & Sep



	ET _o (mm/d)	Rain (mm/d)
Dry S.	3.08	0.07
Wet S.	4.04	20.36



3. Field Activities & Its Results (5)

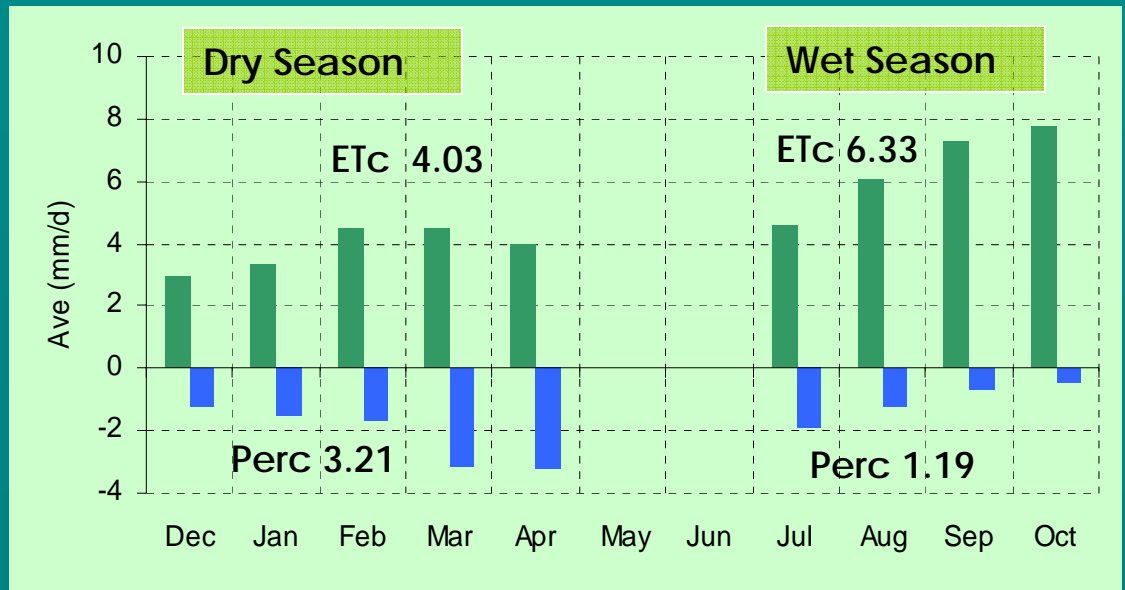
ETc

- Lesser in Dry Season
- Dry Season: high in Feb & March
- Wet Season: High in Sep & Oct



Percolation

- Higher in dry season
- Dry season: High in Mar & Apr
- Wet Season: high in July & Aug



3. Field Activities & Its Results (6)

Crops Production Survey

- Apply Unit harvested method (1 m X 1m) for collecting paddy production
- Total samples of 24 points in dry seasons & 20 points in wet seasons
- Collecting value cross checked with farmers' interview



(Price in 2006-07)

Dry Season

Wet Season

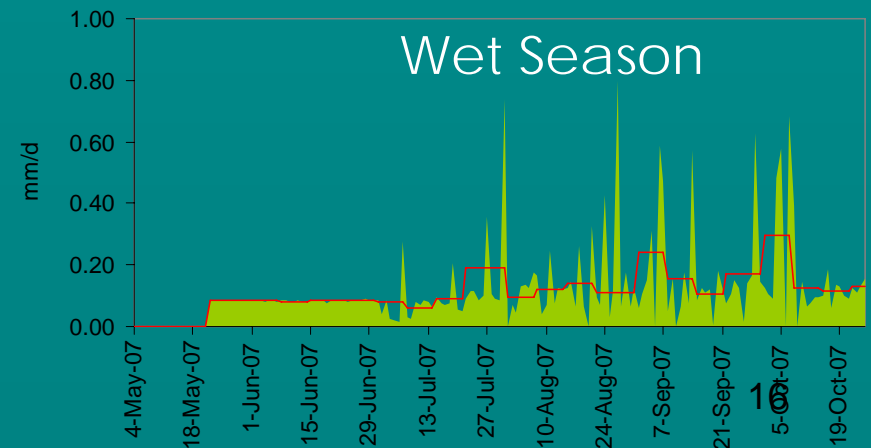
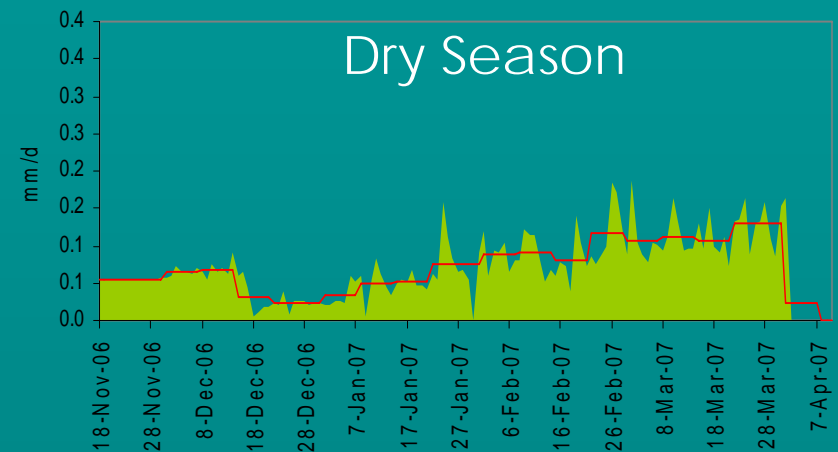
Crop Types	Area		Yield (T/ha)	Price (US\$/T)	Area		Yield (T/ha)	Price (US\$/T)
	ha	%			ha	%		
Paddy	1,485.2	97.4	3.88	239.65	2,236.48	98.8	2.85	217.86
Cash crops	18.78	1.2	8.93	167.72	5	0.2	2.15	108.93
Aquaculture	21.72	1.4	4.07	1,307.35	21.72	1	4.05	1,089.32
Total	<u>1,525.7</u>				<u>2,263.2</u>			

4. Major Findings (1)

Summary of Water Requirement (WR)

WR of each sector	Dry Season	Wet Season
Paddy (MCM)	9.817	20.370
Cash Crops (MCM)	0.078	0.006
Aquaculture (MCM)	0.234	0.296
Total (MCM)	10.129	20.672
Total (mm)	663.90	913.7

- Higher WR in wet season due to longer period & larger planted areas
- **Dry Season** : high WR in Dec. (Land Preparation stage) & in Feb. & Mar. (flowering stage)
- **Wet Season**: WR fluctuated due to rainfall, high WR in early Sep. & Oct.



4. Major Findings (2)

Efficiencies & Water Productivities

- Conveyance Efficiency: The same value used in both dry & wet seasons because the test conducted at one time
- Higher overall efficiency in wet season due to shorter irrigation days, although much more rainfall observed
- Higher water productivity in dry season due to higher yields & higher price

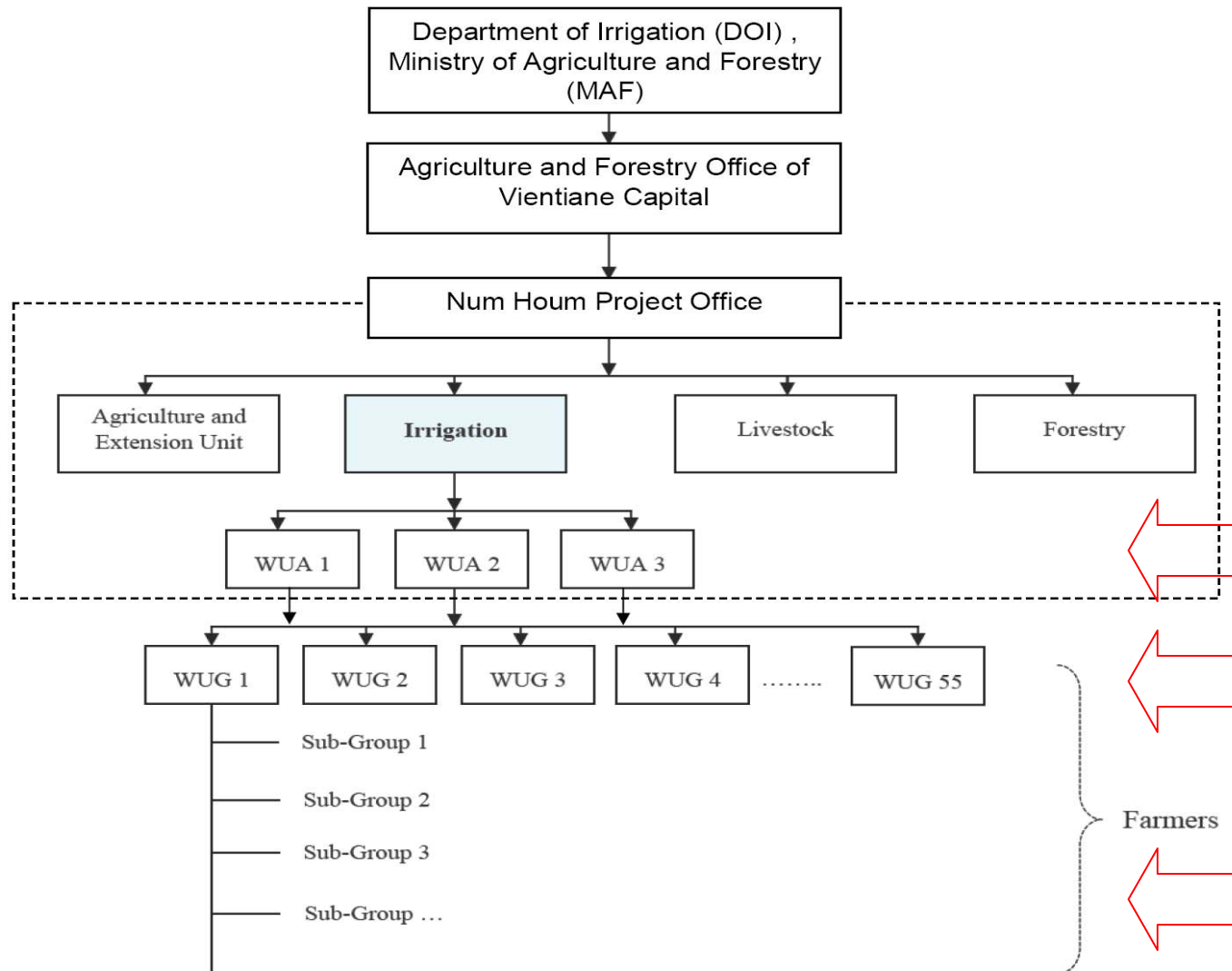
	Dry Season	Wet Season
Conveyance Efficiency (canal off takes/canal intakes)	69.06 %	
Overall Command Area Efficiency (SWR-ER)/(total inflow * Conveyance Effi.- drainage)	65.30 %	78.17 %
Water Productivities (US\$/m ³ of water use)	0.114 US\$/m ³	0.097 US\$/m ³

SWS : System Water Requirement

ER : Effective Rainfall

4. Major Findings (3)

Organization & Water Management

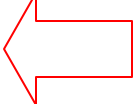
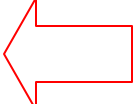
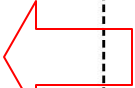


Responsibilities

Reservoir & main canal

Secondary canal

Tertiary canal

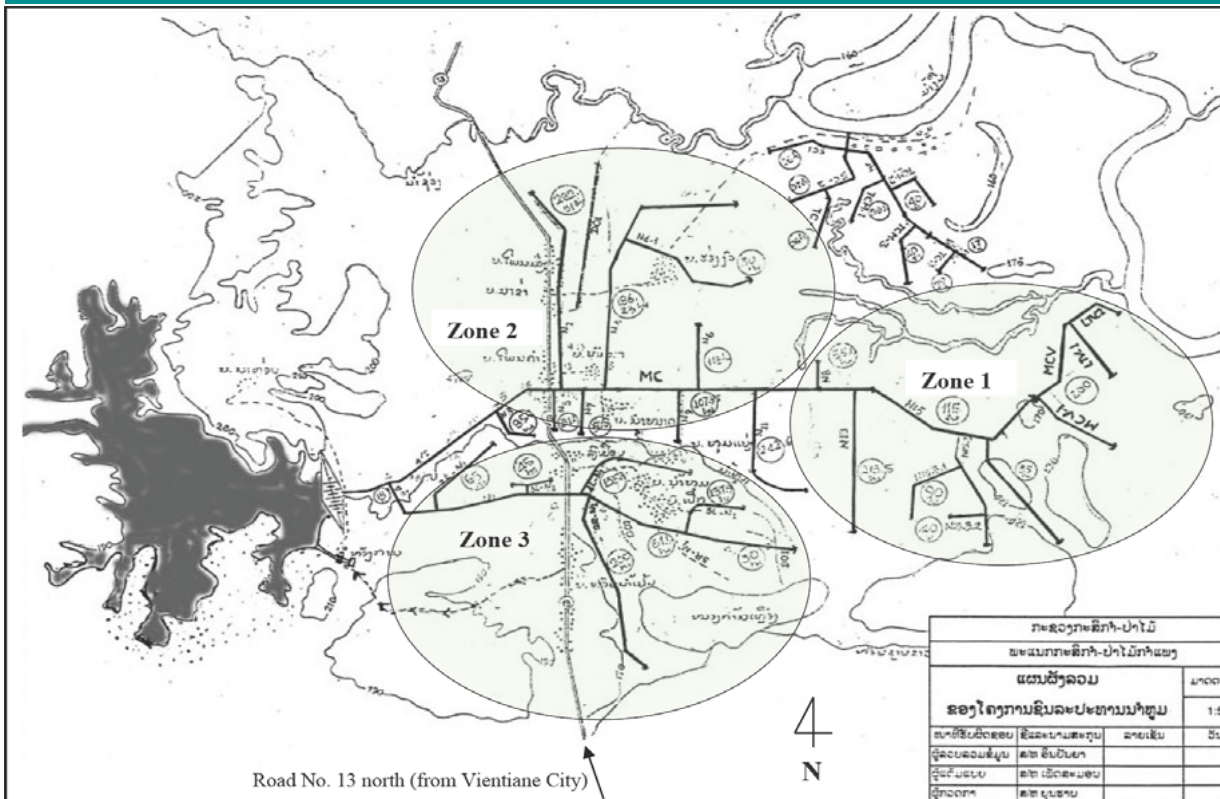


Farmers

4. Major Findings (4)

Water Allocation

- Water allocation plan for every dry- season cultivation, but not for wet season
- Continues/free water supply (no control) when full storage of reservoir
- Rotation in 3 zones when less reservoir storage (unstable rainfall)



- Water supply plan fixed (no flexibility)
- Few feedback system
- Less monitoring

4. Major Findings (5)

Irrigation Service Fee - ISF

- Water fee important for water management as covering facility maintenance & incentive for staff
- Rate of ISF: 150,000 Kip/ha
- 47 % collected in 2006-07 & 40% collected in 2007-08



Project Constraints

- Poor irrigation infrastructures
- Lack of effective water distribution plan & monitoring system
- Lax enforcement regulation in water management practice
- Low skill of staff on proper water management

5. Conclusion

- High efficiency compared with other schemes in Laos (40-50% in general)
- Outflows not observed & controlled by the project
- Water allocation plan not suitable with actual water requirement, adoption plan needed
- Higher efficiency in wet season because of shorter irrigation days (lesser irrigation water Supply)
- Water productivity in dry season higher than wet season due to higher paddy yield and higher production prices
- Good water management practice needs to be implemented to trail the best solution in order to increase water use efficiency, water productivities & farmers' income household

**Thank You for your Kind
Attention**