

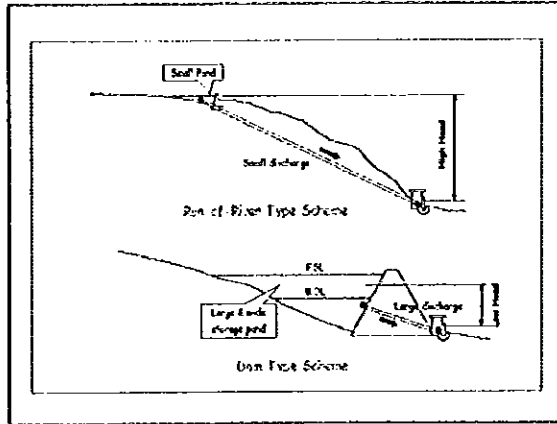
2nd PRESENTER

POWER PLANNER : H. IKEDA

STUDY OF TYPES FOR HYDROPOWER DEVELOPMENT

A. RUN-OF-RIVER TYPE SCHEME

B. DAM TYPE SCHEME

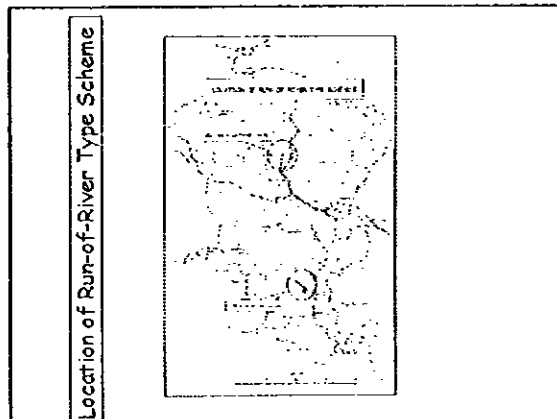


STUDY OF TYPES FOR HYDROPOWER DEVELOPMENT

RUN-OF-RIVER TYPE SCHEME

a. MAIN STREAM RUN-OF-RIVER SCHEME

b. BRANCH RUN-OF-RIVER SCHEME



STUDY OF TYPES FOR HYDROPOWER DEVELOPMENT

ECONOMIC ASPECTS OF RUN-OF-RIVER TYPE SCHEMES

Item	Run-of-River Type Scheme	Dam Type Scheme
Net Available Power (MW)	400 MW	300 MW
Minimum Discharge (liters per second)	1000 lps	1000 lps
Length of project (km)	100 km	100 km
Construction cost (Million US\$)	100	100
Net power production (Million kWh)	100,000,000	100,000,000
Construction cost (Million US\$)	100,000,000	100,000,000
Net power production (Million kWh)	100,000,000	100,000,000

Note: Dam construction cost of 100,000,000 US\$ for 100,000,000 kWh per year is based on the value of 100 US\$ per kWh. Run-of-river type schemes are therefore competitive against the dam type scheme.

STUDY ON SCALE OF DAM TYPE SCHEME

Dam type scheme was selected for development of the Nam Ngiep-I HEPP

1. EXTENT OF STUDY

a. LARGE-SCALE DAMS (FSL400 to FSL200)

The scheme, which aimed at large power output by construction of a high dam

b. MEDIUM-SCALE DAMS (FSL200-FSL100)

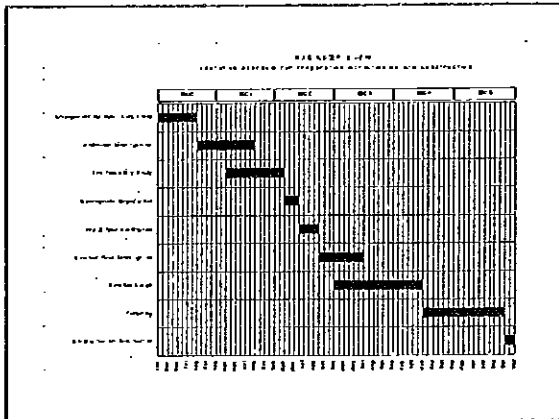
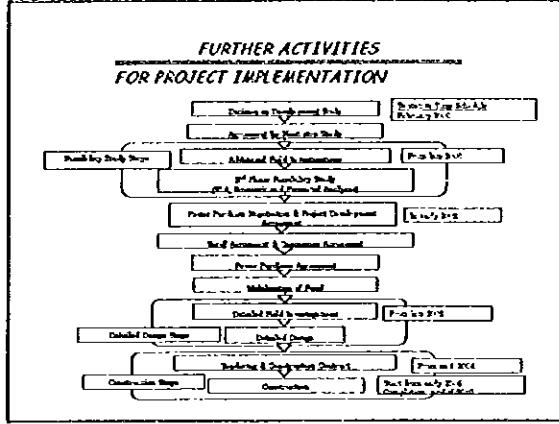
The scheme, which aimed to moderate input by dam-up

c. SMALL-SCALE DAM (FSL100)

The scheme, which aimed to develop without foundation of any village

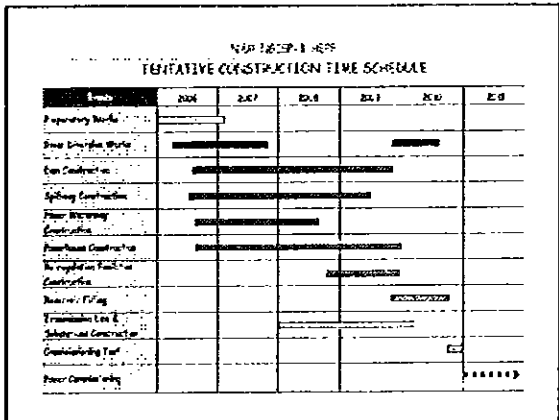
SALIENT FEATURES OF PROPOSED SCHEME

PARTICULARS	FEATURES
Concrete structure type	surface type on stored concrete structure
Waterhead	131.9 m
No. of general turbines	3 units
Type of turbine	vertical shaft Francis type
Installed capacity	845 MW (16.8 wt)
Annual energy production	1.813 GWh
Power transmission line	1200 m of Extra High Voltage Substation with 500 kV line
Serviceable Reservoir	EL 570 m
Max. mean pool level	6.7 m above spill
Storage capacity	0.818 m ³ (sq.180 pct)
Emergency discharge	



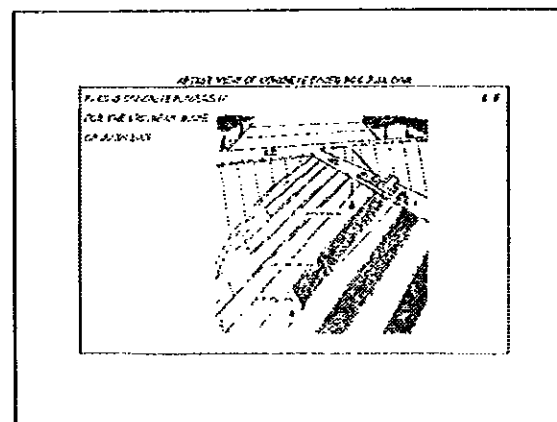
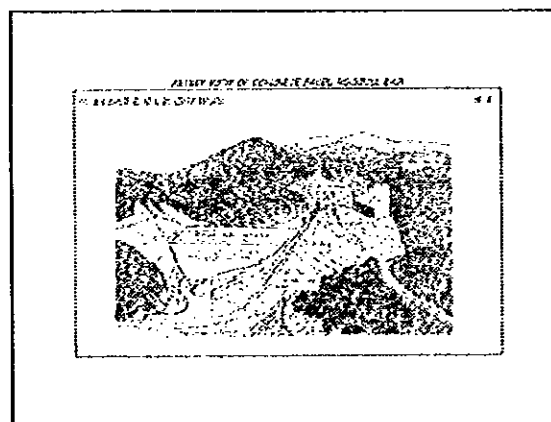
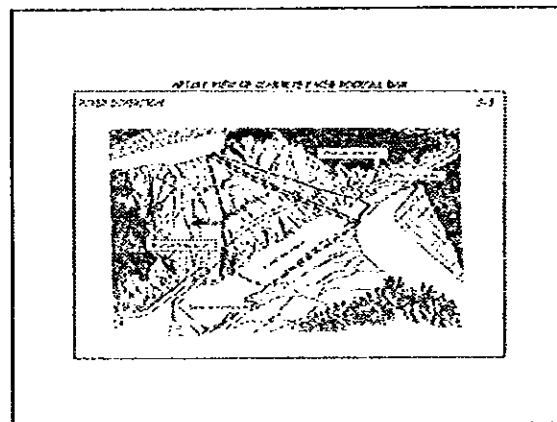
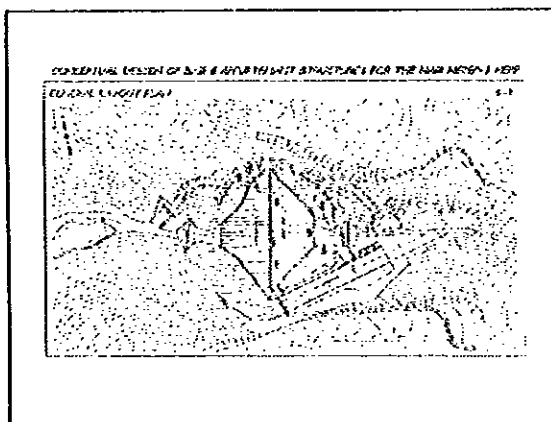
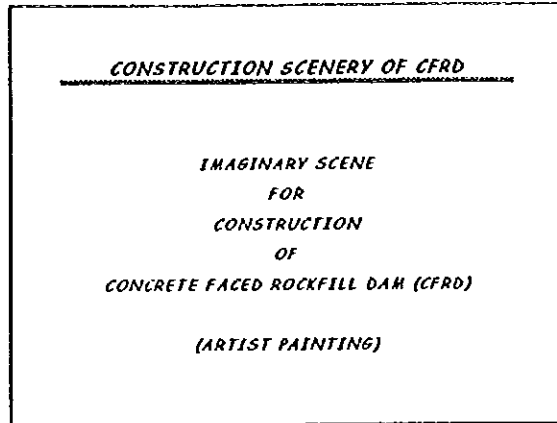
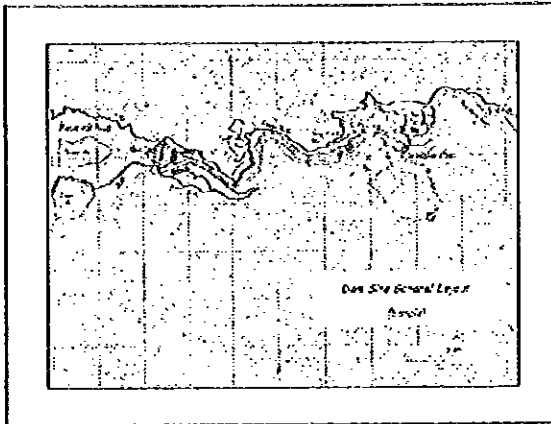
CONSTRUCTION TIME SCHEDULE

*Tentative Construction Time Schedule
Of
The Proposed Scheme
(The Scheme of FSL 320 M)*



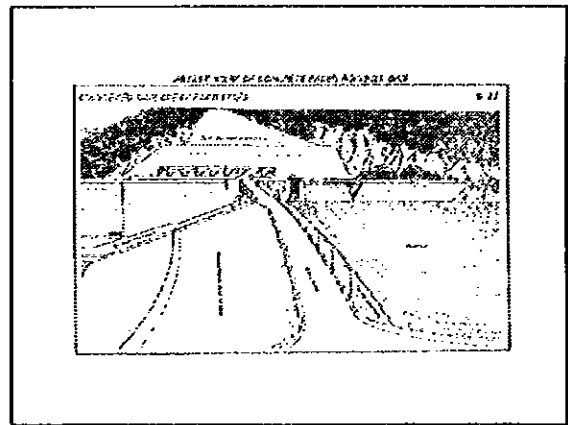
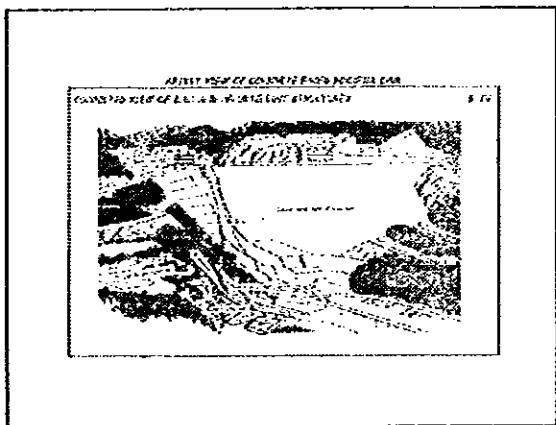
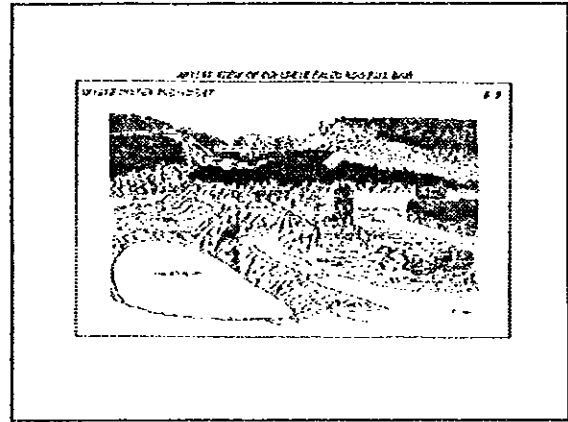
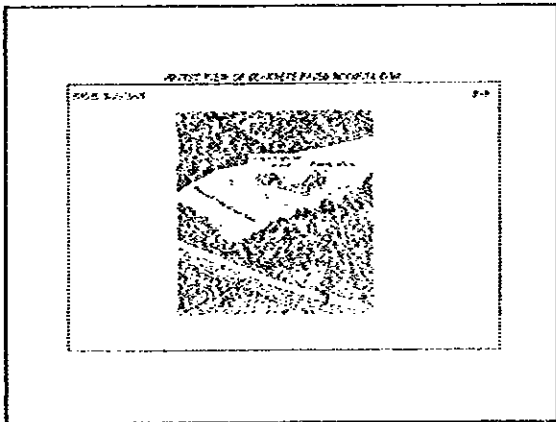
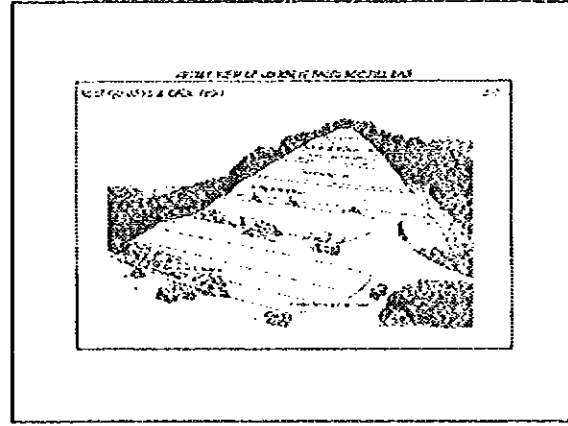
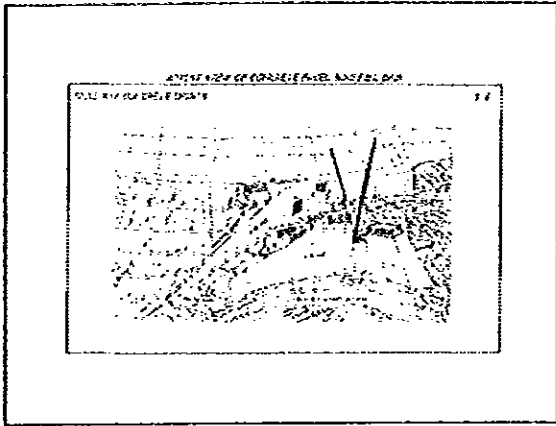
CONSTRUCTION SCENERY OF CFRD

*SITE GENERAL LAYOUT
AND
TYPICAL SECTION OF DAM*



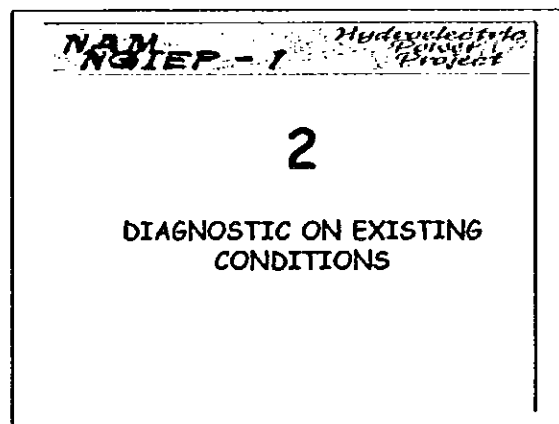
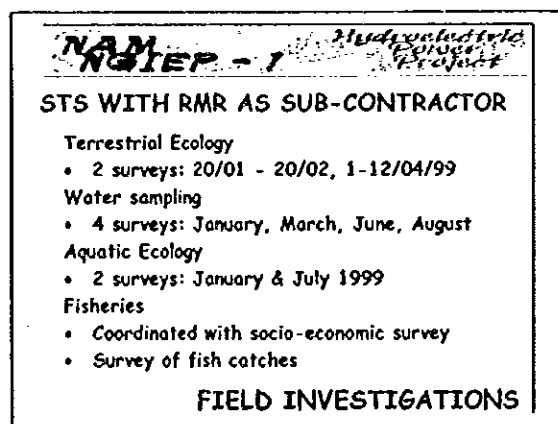
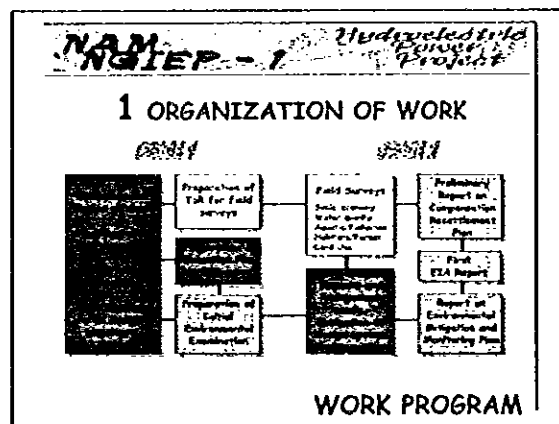
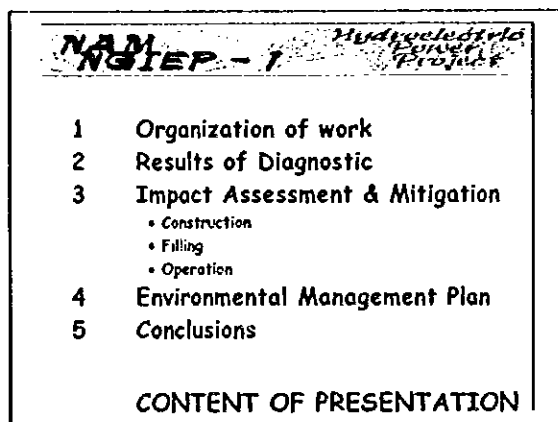
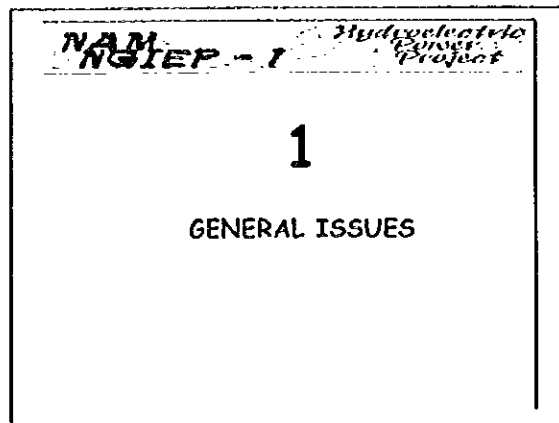
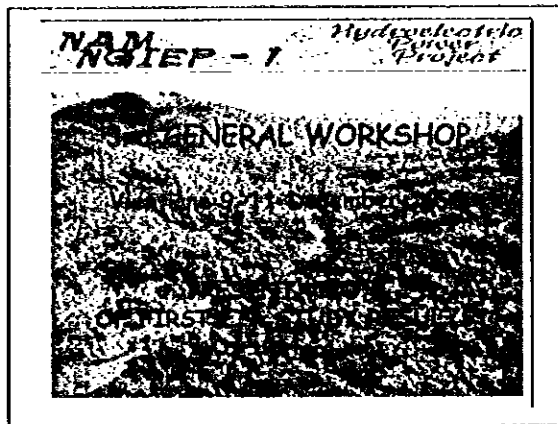
3rd General Workshop

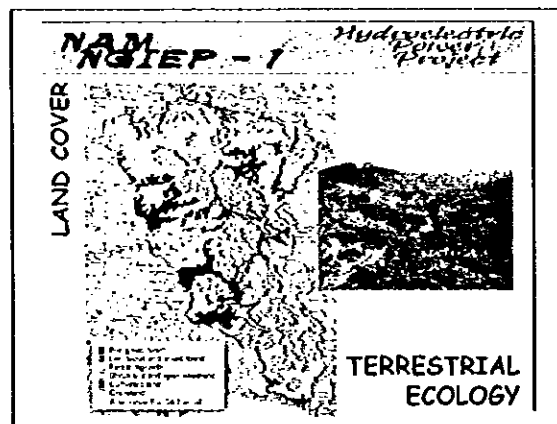
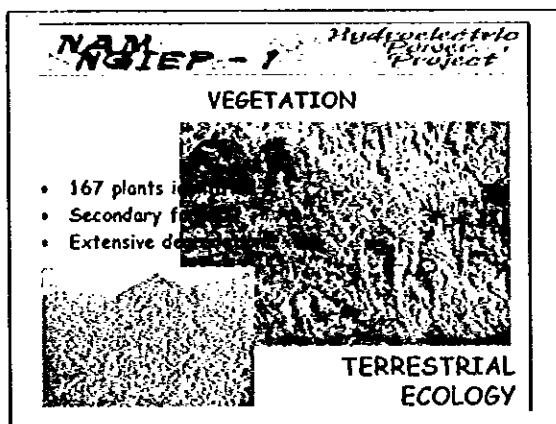
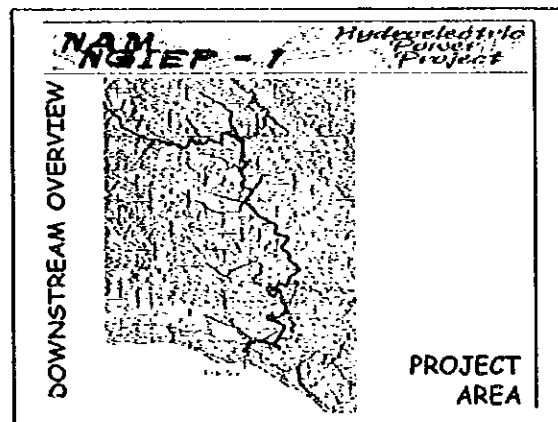
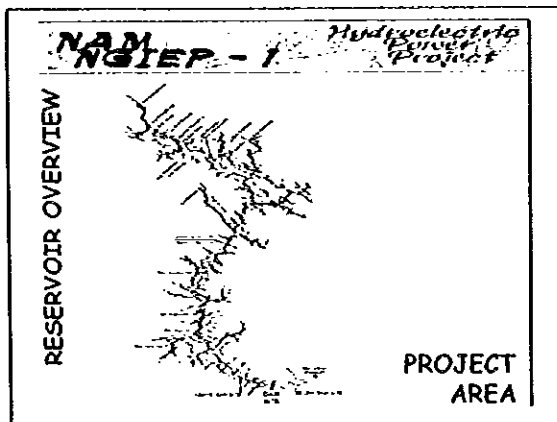
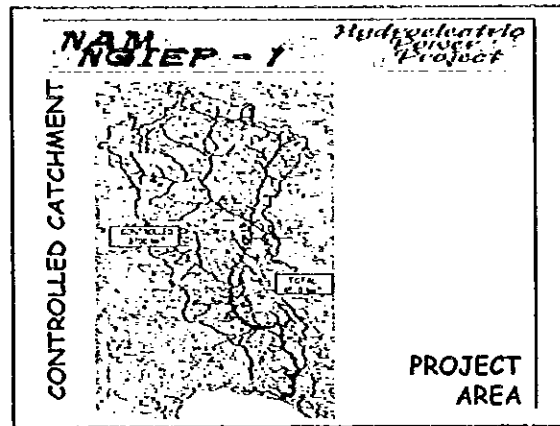
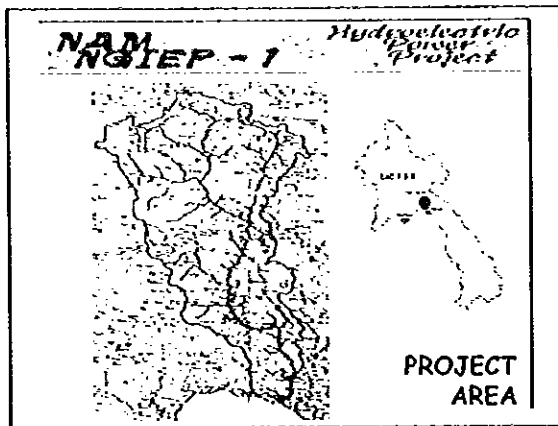
Hydropower Plan



3rd PRESENTER

NATURAL ENVIRONMENTALIST : B. YON





NAM NGIEP - I *Hydroelectric Power Project*

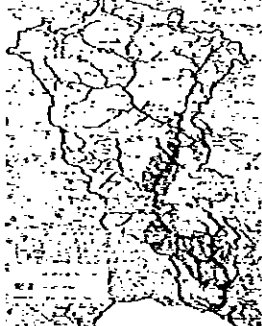
WILDLIFE

- More than 50 mammals and 100 birds
- 16 mammals, 3 reptiles have conservation status
- Elephant, tiger, bear presence downstream dam
- 2 areas of interest for biodiversity

TERRESTRIAL ECOLOGY

NAM NGIEP - I *Hydroelectric Power Project*

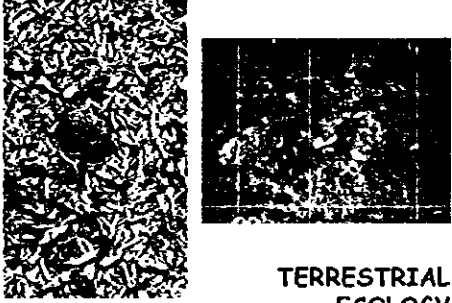
WILDLIFE



TERRESTRIAL ECOLOGY

NAM NGIEP - I *Hydroelectric Power Project*

WILDLIFE



TERRESTRIAL ECOLOGY

NAM NGIEP - I *Hydroelectric Power Project*

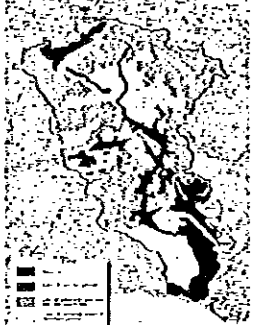
WILDLIFE



TERRESTRIAL ECOLOGY


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LAND POTENTIAL



TERRESTRIAL ECOLOGY

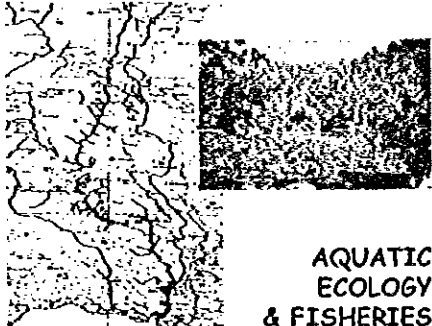
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AQUATIC ECOLOGY & FISHERIES

NAM NGIEP - I *Hydroelectric Power Project*

SAMPLING STATIONS



AQUATIC ECOLOGY & FISHERIES


NAM NGIEP - I *Hydroelectric Power Project*

A RICH BIODIVERSITY

134 species of fish, to be compared with

- Nam Leuk: 122 species
- Nam Theun: 165 species
- Pak Mun: 125 species

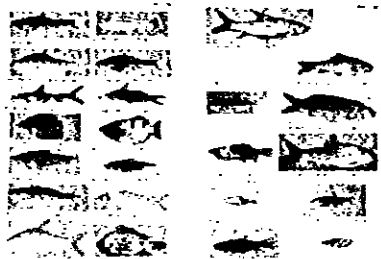
10 to 15 migratory species



AQUATIC ECOLOGY & FISHERIES

NAM NGIEP - I *Hydroelectric Power Project*

CATALOGUE OF FISHES



AQUATIC ECOLOGY & FISHERIES

NAM NGIEP - I *Hydroelectric Power Project*

DISTRIBUTION OF FISH SPECIES

NUMBER OF SPECIES	DISTRIBUTION OF FISH SPECIES		
	Upper Reservoir	Lower Reservoir	Downstream
Only in upper reservoir area			
Only in lower reservoir area		16	
In upper and lower areas			16
Only in downstream area			
Upper, lower and downstream areas		29	
Total species observed			

NAM NGIEP - I *Hydroelectric Power Project*

Fishing >3 days per week

- Upstream: 61%
- Downstream: 34%

Equipment


- Gillnet & Hook Line

Fish consumption

- 137 kg/hh/year or 60 g/capita/day to be compared with ...

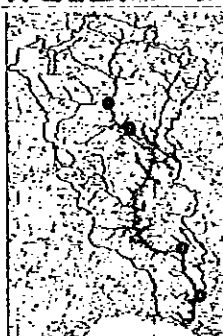
Nam Leuk (3 years monitoring)
133 kg/household/year

AQUATIC ECOLOGY & FISHERIES



NAM NGIEP - I *Hydroelectric Power Project*

SAMPLING STATIONS



4 sampling surveys
4 sampling sites

WATER QUALITY

NAM NGIEP - I *Hydroelectric Power Project*

Good water quality

- Dissolved Oxygen: 6.8 to 8 mg/l
- Mineralization: Medium to low
- Nutrients: Medium to low
- Coliforms: Slight pollution D/S
- Low to medium sediment load

WATER QUALITY

NAM NGIEP - I *Hydroelectric Power Project*

RIVER CONFLUENCE

WATER QUALITY

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MINING ACTIVITIES

MINERAL RESOURCES

NAM NGIEP - I *Hydroelectric Power Project*

3

IMPACTS AND MITIGATION MEASURES

- During Construction
- During Filling
- During Operation

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DOWNSTREAM UPSIDEAM

TYPOLGY OF AREA

NAM NGIEP - I *Hydroelectric Power Project*

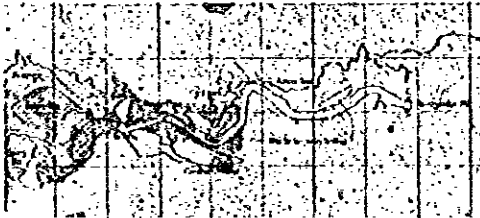
Land Acquisition at Construction Sites

- No resettlement anticipated
- Construction sites: less than 100 ha
- Quarries/Borrow areas: 100 ha minimum
- Re-regulation pond: 90 ha
- Access road: 20 ha
- T.Line: 2 ha (towers) & 550 ha ROW

CONSTRUCTION IMPACTS

NAM NGIEP - I *Hydroelectric Power Project*

CONSTRUCTION SITES



CONSTRUCTION IMPACTS

NAM NGIEP - I *Hydroelectric Power Project*

Health & Safety

- Epidemic diseases
- Road safety
- Electromagnetic field

Water pollution

- Sediment
- Chemical spill
- Pathogens release

Air pollution

CONSTRUCTION IMPACTS

NAM NGIEP - I *Hydroelectric Power Project*

Environmental specifications
 Fair compensation for land
 Water quality monitoring
 Transmission Line mainly in paddy fields
 Permanent monitoring of construction sites

CONSTRUCTION MEASURES

NAM NGIEP - I *Hydroelectric Power Project*

FILLING EVENT OF KEY IMPORTANCE

- Downstream flow abrupt changes
- Water quality alteration
- Flooding of land
- Issues: Duration of filling, velocity of flow

Duration of filling

- Hydrological year & starting month
- Target level to start turbinning: MOL/FSL
- Riparian release allocated
 No RR, 20 m³/s, 50 m³/s

FILLING IMPACTS UPSTREAM

NAM NGIEP - I *Hydroelectric Power Project*

DURATION OF FILLING (MEAN YEAR)

Duration of filling for option 360

- MOL: 4 (no RR) to 6 (RR50) months
- FSL: 15 (no RR) to 18 (RR50) months

Duration of filling for option 320

- MOL: 1.5 (no RR) to 2 (RR50) months
- FSL: 3 (no RR) to 4 (RR50) months

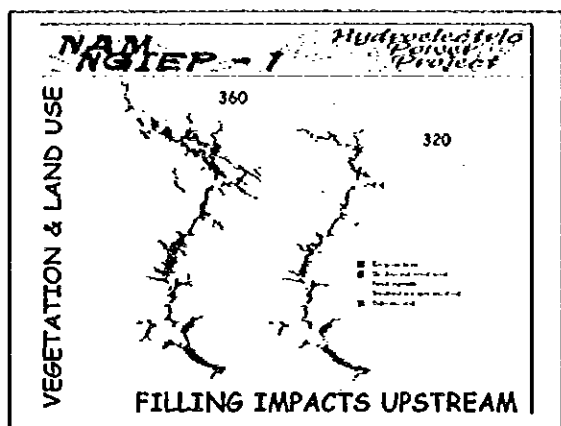
FILLING IMPACTS UPSTREAM

NAM NGIEP - I *Hydroelectric Power Project*

FLOODING IN SHORT

- 50% of FSL360 area flooded in 3 months (75 km²)
- Level raised by 145 m in 3 months, or 1.6 m/day (>2m/day 1st month), but engineering limitation
- Horizontal velocity: Average 2.5 m/hr, more than 10 m/hr in flat areas

FILLING IMPACTS UPSTREAM



NAM NGIEP - I Hydroelectric Power Project

LOSS OF FOREST TIMBER STANDS

- FSL360: 290,000 m³
- FSL320: 148,000 m³

LOSS OF FUTURE FOREST GROWTH

- FSL360: 16,500 m³/year
- FSL320: 8,000 m³/year

LOSS OF NON TIMBER PRODUCTS

FILLING IMPACTS UPSTREAM

NAM NGIEP - I Hydroelectric Power Project

IMPACTS ON WILDLIFE

Velocity of flooding
Temporary islands
Loss of habitats

EFFECTS ON ANIMALS

- Drowning & Trapped on islands & trees
- Soil fauna, non mature & weak animals
- Rapid development of insectivorous fishes and birds.

FILLING IMPACTS UPSTREAM

NAM NGIEP - I Hydroelectric Power Project

FLOODING OF VEGETATION

Severe impact on water quality

- Cause: Decay of organic matter
- Effect: Consumption of dissolved oxygen
- Water unsuitable for aquatic life and human consumption
- Implications on global warming (greenhouse effect) because
 - Production of carbon dioxide (CO₂)
 - Production of methane gas (CH₄)

VEGETATION BIOMASS

NAM NGIEP - I Hydroelectric Power Project

Flooded biomass estimate (undried)

- Preliminary survey: 278.5 tons/ha
- Nam Leuk experience: 289.8 tons/ha

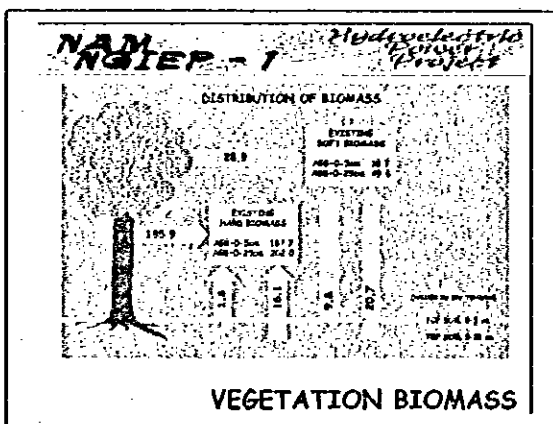
Source of biomass

- Above ground biomass (Vegetation)
- Soil biomass (0-5 cm & 5-25 cm)

Type of biomass

- Soft biomass
- Hard biomass.

VEGETATION BIOMASS



NAM NGIEP - I *Hydroelectric Power Project*

Carbon quantities in the reservoir

- Average of 165 tons C/ha
- FSL360: Soft biomass: 454,000 t
Hard biomass: 1,712,000 t
- FSL320: Soft biomass: 227,000 t
Hard biomass: 857,000 t

VEGETATION BIOMASS

NAM NGIEP - I *Hydroelectric Power Project*

THE CARBON DEGRADATION PROCESS

- 80 to 90% carbon in dry biomass (165t/ha)
- Aerobic conditions: Production CO₂
- Anaerobic conditions: Production CH₄
- 3 mg oxygen to degrade 1 mg methane

Most of carbon degraded as CH₄ (methane)
Possible reduction by clearing.

VEGETATION BIOMASS

NAM NGIEP - I *Hydroelectric Power Project*

POTENTIAL EFFECT OF CLEARING

- Above Ground biomass only
- Logging + clearing + burning:
80% reduction of soft biomass
50% reduction of hard biomass
(based on Nam Leuk experience)

CLEARING ISSUES

NAM NGIEP - I *Hydroelectric Power Project*

DISTRIBUTION OF BIOMASS

VEGETATION BIOMASS

NAM NGIEP - I *Hydroelectric Power Project*

EFFICIENCY OF CLEARING

If considering 0-5 cm soil

- Soft biomass reduction by 60%
- Hard biomass reduction by 50%

If considering 0-25 cm soil

- Soft biomass reduction by 46%
- Hard biomass reduction by 45%

CLEARING ISSUES

NAM NGIEP - I *Hydroelectric Power Project*

BIOMASS MANAGEMENT OPTIONS

- Do nothing
- Cut trees without removal
- Cut trees and remove
- Cut trees and burn

Criteria

- Clearing technology and cost
- Induced beneficial effects of clearing
- Vegetation re-growth

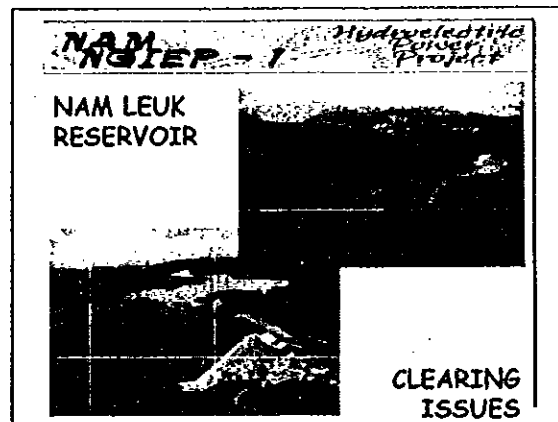
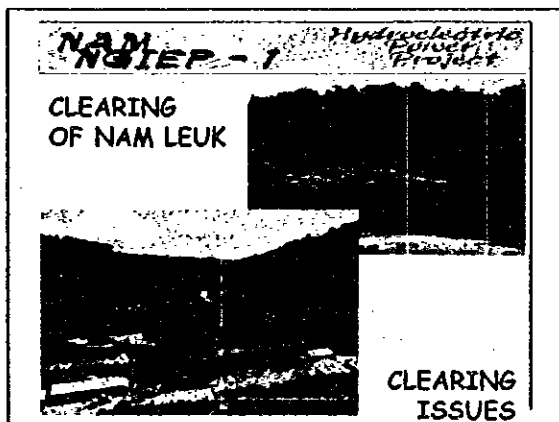
CLEARING ISSUES

NAM NGIEP - I *Hydroelectric Power Project*

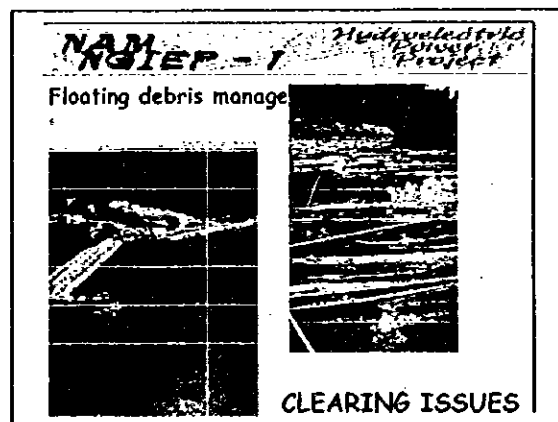
Expected results

	Biomass in '000 tons	Total soft biomass		Total hard biomass	
		FSL 360	FSL 320	FSL 360	FSL 320
Before clearing	with soil 0-5 cm	568.0	284.2	3139.8	1678.9
	With soil 0-25 cm	729.8	364.7	2351.8	1176.8
After clearing	with soil 0-5 cm	229.8	114.8	1003.3	542.1
	With soil 0-25 cm	391.3	195.3	1215.2	647.8
Biomass reduction	with soil 0-5 cm	338.2	169.4	2136.5	1136.8
(as a % of initial situation)	With soil 0-25 cm	45.37	45.45	44.93	44.94

- NAM NGIEP - I** *Hydroelectric Power Project*
- CLEARING STRATEGY**
- Maximize income from timber
 - Minimize impact on dissolved oxygen
 - Minimize nutrients & eutrophication risk
 - Minimize greenhouse gas emission
 - Create suitable area for fish
 - Allow reservoir navigation and fisheries
 - Create stable shoreline
 - Minimize risk of animal drowning.
- CLEARING ISSUES**



- NAM NGIEP - I** *Hydroelectric Power Project*
- RECOMMENDATIONS FOR CLEARING**
- Remove maximum of commercial timber
Max. pot. benefit 7 to 14 million US\$
 - Promote local transformation/floatation
 - Cut, clear & burn remaining vegetation
 - No removal of stumps
 - Haul max. of burnt vegetation residual
 - Maintain 100m buffer zone along channels
 - Preserve 100m vegetation strip on lakeshores
 - Manage floating debris when filling.
- CLEARING ISSUES**



NAM NGIEP - I *Hydroelectric Power Project*

RESERVOIR BEHAVIOR

Level variation (maximum)

- FSL360: 25 m (360-335 m)
- FSL320: 36 m (320-284 m)

Level variation (mean year)

- FSL360: 11 m
- FSL320: 20 m

Shallow waters (0-10m)

- FSL360: 1300-1600 ha
- FSL320: 1000-2200 ha

OPERATION / RESERVOIR LEVELS

NAM NGIEP - I *Hydroelectric Power Project*

DRAWDOWN AREAS

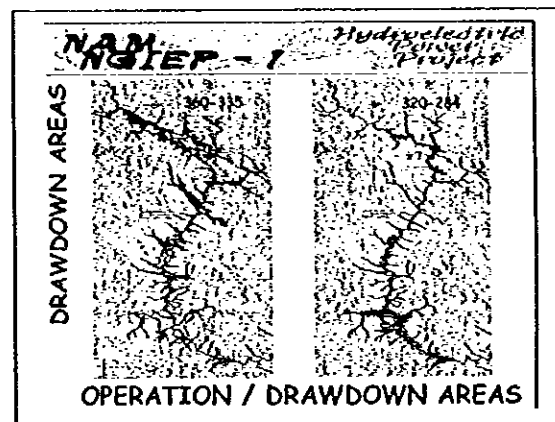
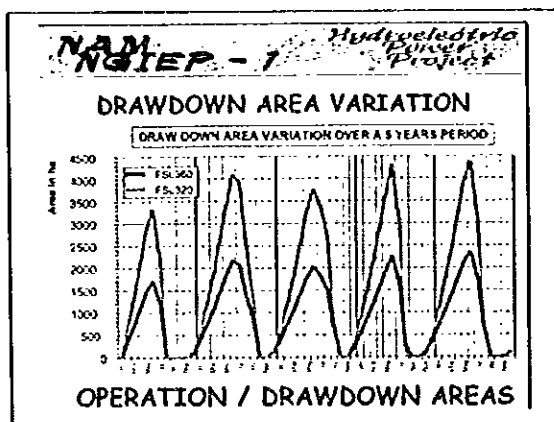
Drawdown areas (maximum)

- FSL360: 4420 ha
- FSL320: 4110 ha

Drawdown areas (average 5 years)

- FSL360: 4 months: 800-1400 ha
5 months: 500-1200 ha
- FSL320: 4 months: 1500-2500 ha
5 months: 1000-2000 ha

OPERATION / DRAWDOWN AREAS



NAM NGIEP - I *Hydroelectric Power Project*

Reservoir sedimentation

- 550,000 m³/year
- Dead storage sufficient
- Risk of critical backwater effects at reservoir tail level for FSL320 option
- Higher catchment/reservoir area ratio for 320

Seismicity risk low
Slope instability risk low.

OPERATION / SEDIMENTS

NAM NGIEP - I *Hydroelectric Power Project*

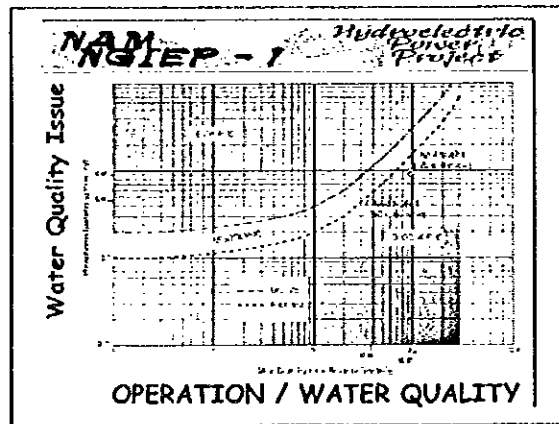
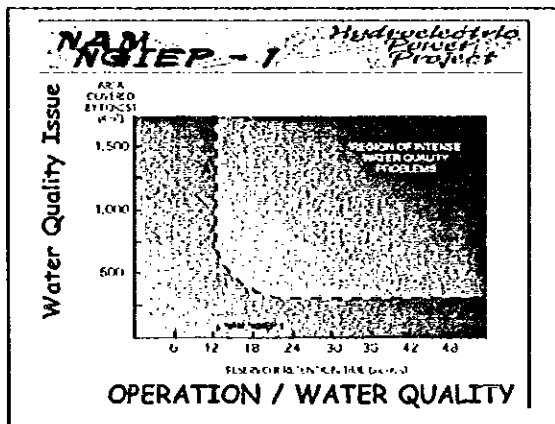
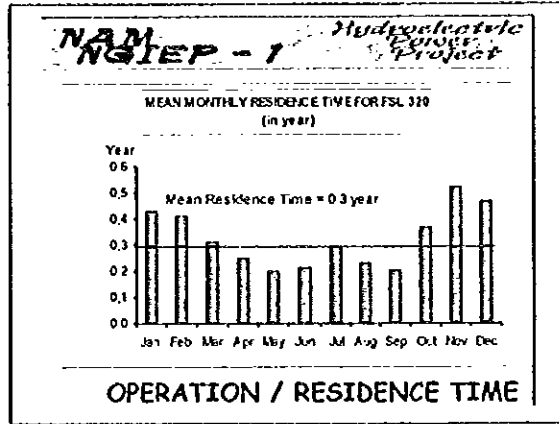
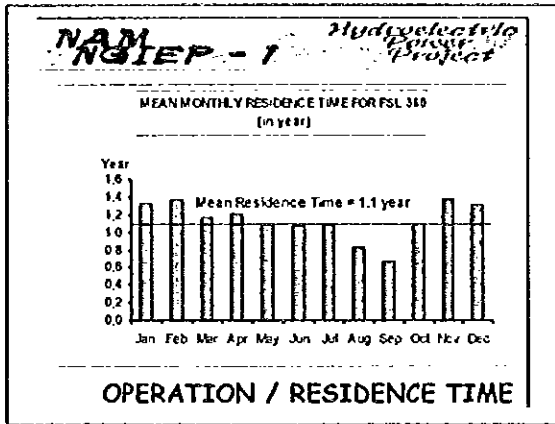
FUTURE RESERVOIR CONDITIONS FORECASTS

Hydraulic residence time

- FSL360: 13.2 months
- FSL320: 3.6 months
- to be compared with

NT2	6.7 months
Nam Leuk	3.1 months
Xe Kaman	3.3 years

OPERATION / RESIDENCE TIME



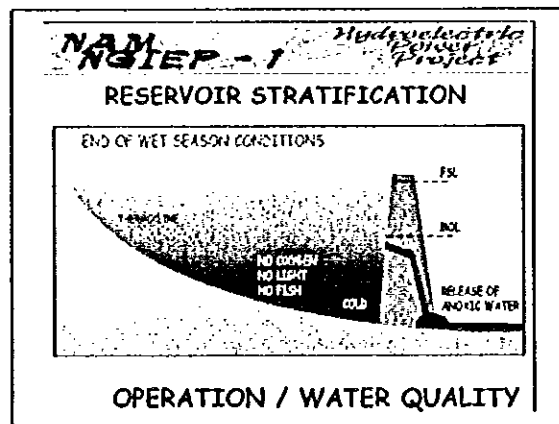
NAM NGIEP - I Hydroelectric Power Project

POSSIBLE DURATION OF WATER QUALITY PROBLEMS

- FSL360: 5-6 years
- FSL320: 2 years but...

...Probable stratification of reservoir, Possible risk of contamination by Orange Agent in Upper Reservoir ?

OPERATION / WATER QUALITY



NAM NGIEP - I *Hydroelectric Power Project*

RESERVOIR STRATIFICATION

END OF DRY SEASON CONDITIONS

OPERATION / WATER QUALITY

NAM NGIEP - I *Hydroelectric Power Project*

RESERVOIR STRATIFICATION

SEASONAL TURN OVER

OPERATION / WATER QUALITY

NAM NGIEP - I *Hydroelectric Power Project*

IMPACTS ON FISHERIES

- 53 species (40%) observed in ponds and lakes in Laos
- Migrating species to be affected
- Potential capture fisheries
 - FSL360: 160 tons/year
 - FSL320: 100 tons/year
- High potential for fish culture

Low risk for aquatic weeds

OPERATION / FISHERIES

NAM NGIEP - I *Hydroelectric Power Project*

WATER BORNE DISEASES

- Malaria: Possible development
- Schistosomiasis: No special risk
- Opistorchiasis: Possible to control

OPERATION / PUBLIC HEALTH

NAM NGIEP - I *Hydroelectric Power Project*

GLOBAL WARMING ISSUES

Importance of clearing

- No clearing (GWP in Million tons CO₂)
 - 10.9 (FSL360)
 - 5.4 (FSL320)
- Clearing (GWP in Million tons CO₂)
 - 6.9 (FSL360)
 - 3.4 (FSL320)

If ton CO₂ valued @ US\$ 10,
Benefit in Million US\$: 40 (360) & 20 (320)

GLOBAL WARMING

NAM NGIEP - I *Hydroelectric Power Project*

COMPARISON WITH THERMAL

Emission of gas in million tons	CO ₂		CH ₄ (CO ₂ eq)		N ₂ O (CO ₂ eq)		Total CO ₂ eq	
	FSL320	FSL360	FSL320	FSL360	FSL320	FSL360	FSL320	FSL360
for a 20 years period								
NG1 No clearing	47	23	62	31	ns	ns	109	54
NG1 clearing	39	19	30	15	ns	ns	69	34
Fuel Oil	41	30	23	18	3.9	2.8	47.2	34.4
Coal	50	36	0.4	0.3	23	16	73.4	52.3
Natural gas	23	18	23.4	18.8	0.2	0.17	46.6	33.0

NAM NGIEP - I *Hydroelectric Project*

LOSS OF CARBON CREDITS FOR LAO PDR

If valued @ US\$ 10/ ton CO2
 FSL360: 50 to 75,000 US\$/year
 FSL320: 24 to 36,000 US\$/year

To be considered during tariff negotiation with Thailand?

GLOBAL WARMING

NAM NGIEP - I *Hydroelectric Project*

DOWNSTREAM IMPACTS DURING FILLING AND OPERATION

FILLING IMPACTS DOWNSTREAM

NAM NGIEP - I *Hydroelectric Project*

ALTERATION OF RIVER FLOW

- 15% of initial flow at Muangmai
- Insufficient in dry season
- Need to provide riparian release
 2 options: 20 m³/s
 50 m³/s

FILLING IMPACTS DOWNSTREAM

NAM NGIEP - I *Hydroelectric Project*

FLOW DURING FILLING (m³/s)

FILLING IMPACTS DOWNSTREAM

NAM NGIEP - I *Hydroelectric Project*

FLOW DURING FILLING (%)

FILLING IMPACTS DOWNSTREAM

NAM NGIEP - I *Hydroelectric Project*

Water quality alteration

- Anoxic water (no dissolved Oxygen)
- Unsuitable for drinking
- Unsuitable for fish life

Proposed measures

- Re-aeration device at tail race
- Alternative water supply
- Alternative fish production systems

FILLING IMPACTS DOWNSTREAM

NAM NGIEP - 1 *Hydroelectric Power Project*

LOSS OF CARBON CREDITS FOR LAO PDR

If valued @ US\$ 10/ ton CO2
 FSL360: 50 to 75,000 US\$/year
 FSL320: 24 to 36,000 US\$/year

To be considered during tariff negotiation with Thailand?

GLOBAL WARMING

NAM NGIEP - 1 *Hydroelectric Power Project*

DOWNSTREAM IMPACTS DURING FILLING AND OPERATION

FILLING IMPACTS DOWNSTREAM

NAM NGIEP - 1 *Hydroelectric Power Project*

ALTERATION OF RIVER FLOW

- 15% of initial flow at Muangmai
- Insufficient in dry season
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 2 options: 20 m3/s
 50 m3/s

FILLING IMPACTS DOWNSTREAM

NAM NGIEP - 1 *Hydroelectric Power Project*

FLOW DURING FILLING (m³/s)

FILLING IMPACTS DOWNSTREAM

NAM NGIEP - 1 *Hydroelectric Power Project*

FLOW DURING FILLING (%)

FILLING IMPACTS DOWNSTREAM

NAM NGIEP - 1 *Hydroelectric Power Project*

Water quality alteration

- Anoxic water (no dissolved Oxygen)
- Unsuitable for drinking
- Unsuitable for fish life

Proposed measures

- Re-aeration device at tail race
- Alternative water supply
- Alternative fish production systems

FILLING IMPACTS DOWNSTREAM

NAM NGIEP - I *Hydroelectric Power Project*

DURATION OF FILLING

Hydrological year	Rainfall Release	Time to reach (months)			
		Alternative FSL399		Alternative FSL329	
		FSL	MOJ	FSL	MOJ
	No Regulation	9	7	1	1
	20% Reg. Pond	10	7	2	1
	40% Reg. Pond	11	7	2	1
	No Regulation	11	10	1	2
On Year	20% Reg. Pond	25	18	12	2
	40% Reg. Pond	27	19	14	2

NAM NGIEP - I *Hydroelectric Power Project*

VELOCITY OF FLOODING

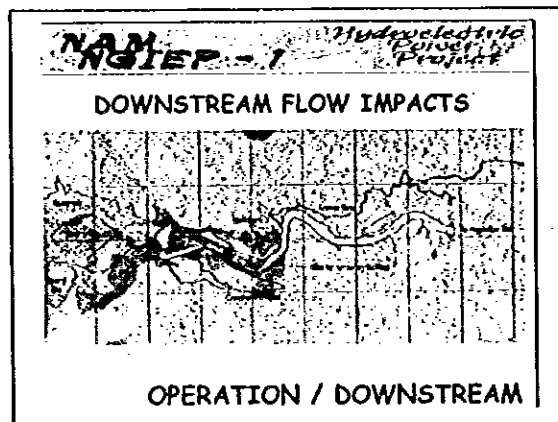
Reach	Length (m)	Alternative FSL399		Alternative FSL329	
		Time (hrs)	Velocity (m/s)	Time (hrs)	Velocity (m/s)
100	100	1	1	1	1
101	250	2	1	1	1
102	250	2	1	1	1
103	250	2	1	1	1
104	250	2	1	1	1
105	250	2	1	1	1
106	250	2	1	1	1
107	250	2	1	1	1
108	250	2	1	1	1
109	250	2	1	1	1
110	250	2	1	1	1
111	250	2	1	1	1
112	250	2	1	1	1
113	250	2	1	1	1
114	250	2	1	1	1
115	250	2	1	1	1
116	250	2	1	1	1
117	250	2	1	1	1
118	250	2	1	1	1
119	250	2	1	1	1
120	250	2	1	1	1

NAM NGIEP - I *Hydroelectric Power Project*

DOWNSTREAM FLOW IMPACTS

- Unstable daily flow
 - No regulation
 - 0 m3/s for 8 hrs/day
 - 220 m3/s for 16 hrs/day
 - Re-regulation pond
 - 140 m3/s for 24 hrs/day
 - Adjusted on Sundays/Holidays.

OPERATION / DOWNSTREAM

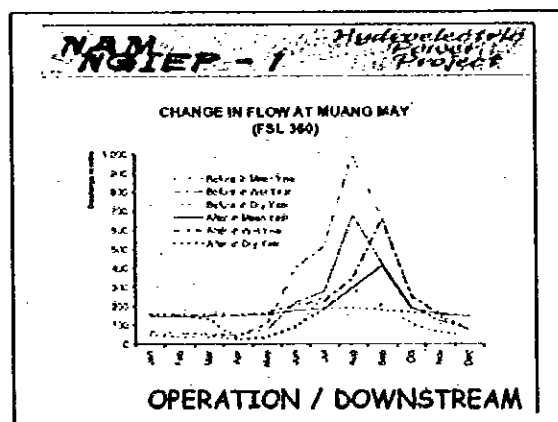


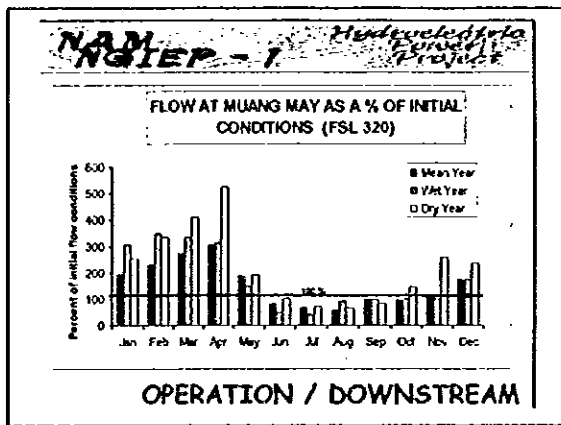
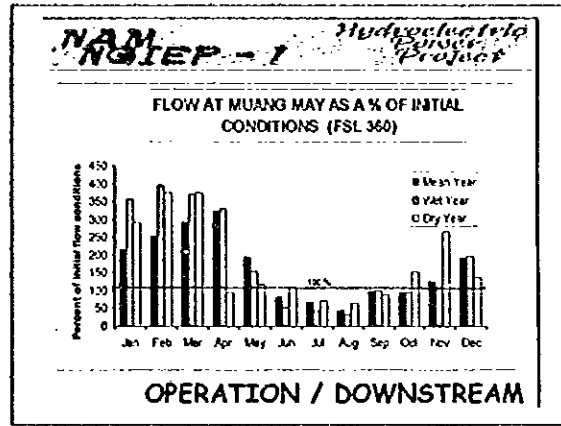
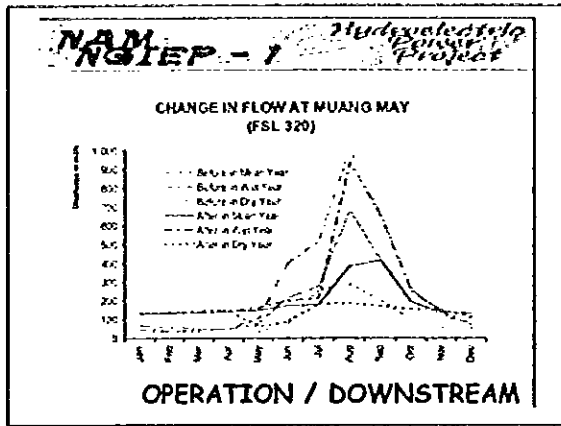
NAM NGIEP - I *Hydroelectric Power Project*

DOWNSTREAM FLOW IMPACTS

- Unstable daily flow
 - No regulation
 - 0 m3/s for 8 hrs/day
 - 220 m3/s for 16 hrs/day
 - Re-regulation pond
 - 140 m3/s for 24 hrs/day
 - 25.7 m3/s on Sunday & Holidays
- More stable seasonal flow

OPERATION / DOWNSTREAM





NAM NGIEP - I *Hydroelectric Power Project*

DOWNSTREAM FLOW IMPACTS

- Flood risk & effects
- River bed erosion
- Mekong: Floodplain & sedimentation

OPERATION / DOWNSTREAM

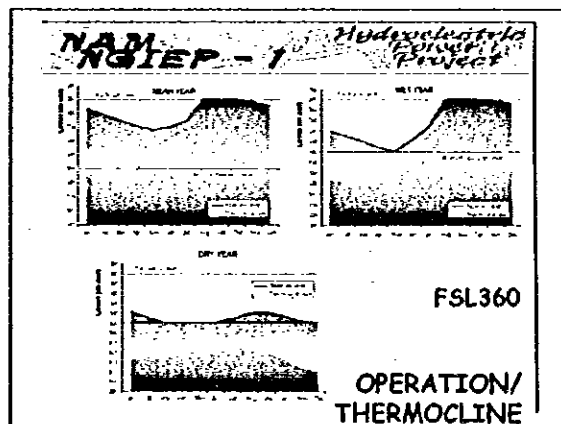
NAM NGIEP - I *Hydroelectric Power Project*

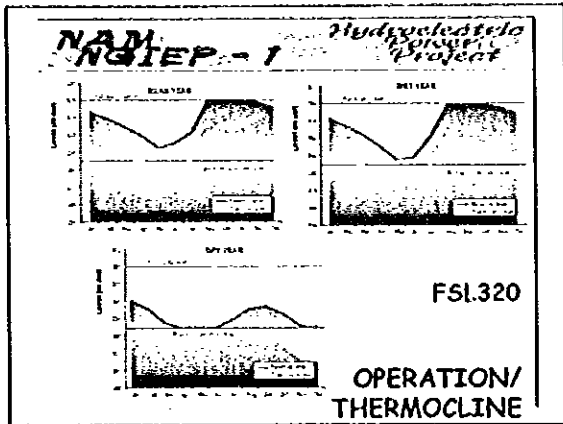
DOWNSTREAM WATER QUALITY

Effects from reservoir stratification:

- 15-25 m depth epilimnion with seasonal changes
- Thermocline probably unstable, with probable seasonal turn-over
- Downstream effects depend on hydrological year.

OPERATION / DOWNSTREAM





NAM NGIEP - I *Hydroelectric Power Project*

DOWNSTREAM WATER QUALITY

Release of anoxic & methane rich water

- FSL360
 - 10 months/year if mean year
 - 4 months/year in wet year
- FSL320
 - 9 months/year if mean or wet year

Effects on fisheries and water use because limited turbulence and dilution

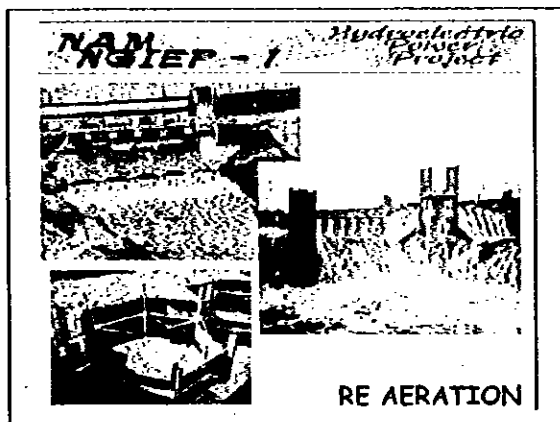
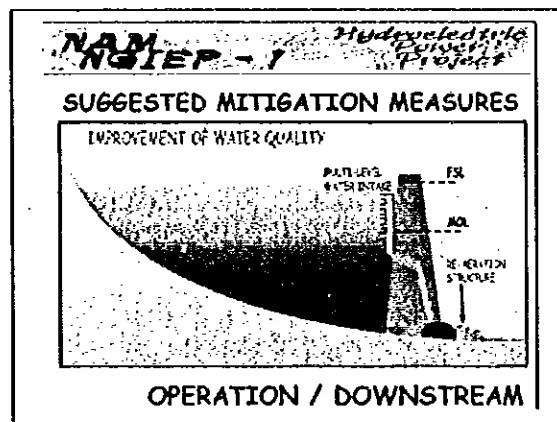
OPERATION / DOWNSTREAM

NAM NGIEP - I *Hydroelectric Power Project*

SUGGESTED MITIGATION MEASURES

Multi-level intake
Re-aeration structure.

OPERATION / DOWNSTREAM



NAM NGIEP - I *Hydroelectric Power Project*

SUGGESTED MITIGATION MEASURES

Multi-level intake
Re-aeration structure

Alternative water supply for villages
Intensification program for fisheries

Promotion of irrigation potential.

OPERATION / DOWNSTREAM

NAM NGIEP - I *Hydroelectric Project*

4

ENVIRONMENTAL MANAGEMENT PLAN

Objectives

- Framework for implementation
- Measures
- Roles and responsibilities

EMP

NAM NGIEP - I *Hydroelectric Project*

COMPLETION OF EIA STUDIES (1)

A1	Monitoring of fisheries	JCAMPO	Dept. Fishery
A2	Aquatic Ecology surveys	JCAMPO	Consulting
A3	Study on characteristics of fisheries in reservoir area and in downstream villages	JCAMPO	Consulting
A4	Water quality monitoring	JCAMPO	Consulting
A5	Water quality forecast study with reservoir modeling	JCAMPO	Consulting
A6	Study of sedimentation and silt entry effects	JCAMPO	Consulting
A7	Study and design of water re-aeration structures	JCAMPO	Consulting
A8	Study for application of riparian release	JCAMPO	Consulting
A9	Study for Downstream villages water supply	JCAMPO	Consulting
A10	Land use study based on recent aerial photos for reservoir, access road and TL	JCAMPO	Consulting

NAM NGIEP - I *Hydroelectric Project*

COMPLETION OF EIA STUDIES (2)

A11	Land use study of village streams along river banks in downstream area	JCAMPO	Consulting
A12	Study on wildlife and biodiversity with preparation of a rescue plan	JCAMPO	Consulting
A13	Survey of reservoir timber and vegetation biomass	JCAMPO	NGIP Consulting
A14	Preparation of a logging and clearing plans	JCAMPO	Consulting
A15	Strategic study for biodiversity conservation and support (participation to trust fund?)	JCAMPO	CPAWM Consulting
A16	Preliminary watershed management plan	JCAMPO	Consulting
A17	EIA for resettlement sites (Provisional budget)	JCAMPO	JCAMPO
A18	Preparation of release Environmental Management and Monitoring Plan	JCAMPO	Consulting
A19	Coordination reporting presentation	JCAMPO	Consulting

NAM NGIEP - I *Hydroelectric Project*

ESTIMATED BUDGET FOR PROPOSED MEASURES

Measures for completion of EIA

- 19 specific studies or activities
- Budget: FSL360 ('000 US\$): 1,040
- FSL320 ('000 US\$): 1,006

EMP

NAM NGIEP - I *Hydroelectric Project*

MEASURES DURING DETAILED DESIGN

B1	Constitution of EMU	GOLDEV	STENO HPOFDL
B2	Capacity building of EMU (1 year Technical Assistance) & Creation of Committees	STEMOKE V	EMP Consulting
B3	Preparation of detailed working program for EMU	GOLDEV	STENO Consulting
B4	Appointment of Independent Panel of Experts (IPE)	GOLDEV	STENO
B5	Preparation of detailed environmental specifications for Contractors	DEVHPO	Consulting

NAM NGIEP - I *Hydroelectric Project*

ESTIMATED BUDGET FOR PROPOSED MEASURES

Measures during Detailed Design

- Organization & Training of EMU
- Budget: FSL360 ('000 US\$): 410
- FSL320 ('000 US\$): 410

EMP

NAM NGIEP - 1 *Hydroelectric Power Project*

4

ENVIRONMENTAL MANAGEMENT PLAN

Objectives

- Framework for implementation
- Measures
- Roles and responsibilities

EMP

NAM NGIEP - 1 *Hydroelectric Power Project*

COMPLETION OF EIA STUDIES (1)

A1	Monitoring of fisheries	JCANPO	Consulting
A2	Aquatic Ecology surveys	JCANPO	Consulting
A3	Study on the collection of fishes in reservoir and in downstream valleys	JCANPO	Consulting
A4	Water quality monitoring	JCANPO	Consulting
A5	Water quality forecast (study with reservoir modeling)	JCANPO	Consulting
A6	Study of sedimentation and its broader effects	JCANPO	Consulting
A7	Study and design of water re-creation structures	JCANPO	Consulting
A8	Study for optimization of riparian forests	JCANPO	Consulting
A9	Study for downstream villages water supply	JCANPO	Consulting
A10	Land use study based on river bed plan for reservoir, access road and TL	JCANPO	Consulting

EMP

NAM NGIEP - 1 *Hydroelectric Power Project*

COMPLETION OF EIA STUDIES (2)

A11	Land use study of village projects along river banks in construction area	JCANPO	Consulting
A12	Study on wildlife and biodiversity with preparation of a rescue plan	JCANPO	Consulting
A13	Survey of reservoir fishes and vegetation biomass	JCANPO	NOFA, Consulting
A14	Preparation of a logging and clearing plan	JCANPO	Consulting
A15	Structure study for monitoring transportation and access (air/road to lake head)	JCANPO	SPANN, Consulting
A16	Provisionary watershed management plan	JCANPO	JCANPO
A17	EIA for resettlement area (provisional budget)	JCANPO	JCANPO
A18	Preparation of detailed Environmental Management and Monitoring Plan	JCANPO	Consulting
A19	Coordination, reports, presentation	JCANPO	Consulting

EMP

NAM NGIEP - 1 *Hydroelectric Power Project*

ESTIMATED BUDGET FOR PROPOSED MEASURES

Measures for completion of EIA

- 19 specific studies or activities
- Budget: FSL360 ('000 US\$): 1,040
- FSL320 ('000 US\$): 1,006

EMP

NAM NGIEP - 1 *Hydroelectric Power Project*

MEASURES DURING DETAILED DESIGN

B1	Constitution of EMU	GOLDEV	STENO/PROECL
B2	Capacity building of EMU (1 year Technical Assistance) & Creation of Committees	STENO/DEV	EMU Consulting
B3	Preparation of detailed working program for EMU	GOLDEV	STENO/Consulting
B4	Appointment of Independent Panel of Experts (IPE)	GOLDEV	STENO
B5	Preparation of detailed environmental specifications for Contractors	DEV/PO	Consulting

EMP

NAM NGIEP - 1 *Hydroelectric Power Project*

ESTIMATED BUDGET FOR PROPOSED MEASURES

Measures during Detailed Design

- Organization & Training of EMU
- Budget: FSL360 ('000 US\$): 410
- FSL320 ('000 US\$): 410

EMP

NAM NGIEP - I Hydroelectric Power Project

MEASURES DURING CONSTRUCTION

C1	Provide operation budget for EMU	GOLDEV	STENO
C2	Provide budget for Independent Panel of Experts (IPE)	GOLDEV	EMU
C3	Monitoring of contractors' construction sites and camps	GOLDEV	EMU
C4	Partners for compensation for accidental spill or downstream pollution	STENO	EMU
C5	Partners for independent monitoring bids and protection of impacts from firewood	EMU	Consulting
C6	Monitoring of fisheries in reservoir & downstream villages	EMU	Fishery Dept.
C7	Construction of water supply facilities for downstream villages (over 10 years of construction)	EMU	Contractor
C8	Water quality monitoring (incl. fish availability)	EMU	Vietnam Laboratory

NAM NGIEP - I Hydroelectric Power Project

MEASURES DURING CONSTRUCTION

C9	Study for detailed rehabilitation of quarries, benches and spoil areas	EMU	Contracting
C10	Preparation of specifications for logging and clearing tender documents, evaluation of tenders	STENO Dept. of Forestry	EMU Consulting
C11	Technical Assistance to EMU for supervision and monitoring of logging and clearing	EMU	Consulting D. Forestry
C12	Clearing of reservoir	EMU	Contractor
C13	Preparation of a detailed watershed development and management plan	STENO CPAFU	Consulting
C14	Study for creation of wildlife reserve	STENO	EMU Consulting
C15	Study for land acquisition and compensation along access road and transmission line	STENO/DCV	EMU

NAM NGIEP - I Hydroelectric Power Project

ESTIMATED BUDGET FOR PROPOSED MEASURES

Measures during construction

- 15 measures
- Budget: FSL360 ('000 US\$): 8,080
- FSL320 ('000 US\$): 5,230

EMP

NAM NGIEP - I Hydroelectric Power Project

MEASURES DURING FILLING

D1	Provide operation budget for EMU	GOLDEV	STENO
D2	Water quality monitoring	EMU	Vietnam Laboratory
D3	Specific monitoring of released water quality	STENO	EMU Consulting
D4	Monitoring of downstream fisheries	EMU	Fishery Dept.
D5	Implementation of the animal rescue plan and management of the filling event (2 years)	EMU	Consulting Contractor
D6	Removal of floating limbs and branches and debris on ground landings	EMU	Contractor
D7	Implementation of the fisheries intensification program in downstream villages	MOAF	Fishery Dept. Contractor

NAM NGIEP - I Hydroelectric Power Project

ESTIMATED BUDGET FOR PROPOSED MEASURES

Measures during Filling

- 7 measures
- Budget: FSL360 ('000 US\$): 599
- FSL320 ('000 US\$): 499

EMP

NAM NGIEP - I Hydroelectric Power Project

MEASURES DURING OPERATION (years 1-5)

E1	Provide operation budget for EMU	GOLDEV	
E2	Water quality monitoring	EMU	Vietnam Laboratory
E3	Specific monitoring of released water quality	STENO	EMU Consulting
E4	Management of the filling event (2nd year)	EMU	Consulting Contractor
E5	Evaluation of compensation for loss of river bank address of existing irrigation facilities	STENO	EMU

NAM NGIEP - 1 *Hydroelectric Power Project*

MEASURES DURING CONSTRUCTION

C1	Provide operating budget for EMU	GOLOEV	STENO
C2	Provide budget for independent Panel of Experts (P)	GOLOEV	EMU
C3	Rendering of contractor's construction sites and dams	GOLOEV	EMU
C4	Provide the design/plan for scheduled land reclamation activities	STENO	EMU
C5	Provide for independent investigations and monitoring of impact event frequency	EMU	Consulting
C6	Monitoring of siltation in reservoir & downstream villages	EMU	Fishery Dept.
C7	Construction of water supply facilities for downstream villages over 1-2 years of construction	EMU	Contractor
C8	Water quality monitoring (incl. fish assistance)	EMU	Vietnam Laboratory

NAM NGIEP - 1 *Hydroelectric Power Project*

MEASURES DURING CONSTRUCTION

C9	Study for detailed rehabilitation of pioneer, better and poor areas	EMU	Consulting
C10	Preparation of specifications for logging and clearing (include documents, estimates of forest's)	STENO Dept. of Forestry	EMU Consulting
C11	Technical Assistance to EMU for supervision and monitoring of logging and clearing	EMU	Consulting S. P. 011977
C12	Clearing of reservoir	EMU	Contractor
C13	Preparation of a detailed watershed development and management plan	STENO CF/WWF	Consulting
C14	Study for creation of wildlife reserve	STENO	EMU, Consulting
C15	Survey for land acquisition and compensation along access road and transmission line	STENO/DOE V	EMU

NAM NGIEP - 1 *Hydroelectric Power Project*

ESTIMATED BUDGET FOR PROPOSED MEASURES

Measures during construction

- 15 measures
- Budget: FSL360 ('000 US\$): 8,080
- FSL320 ('000 US\$): 5,230

EMP

NAM NGIEP - 1 *Hydroelectric Power Project*

MEASURES DURING FILLING

D1	Provide operation budget for EMU	GOLOEV	STENO
D2	Water quality monitoring	EMU	Vietnam Laboratory
D3	Specific monitoring of released water quality	STENO	EMU, Consulting
D4	Monitoring of downstream fisheries	EMU	Fishery Dept.
D5	Implementation of the animal rescue plan and management of the filling event (2 years)	EMU	Consulting, Contractor
D6	Removal of floating trash and branches and release on ground landings	EMU	Contractor
D7	Implementation of the fisheries rehabilitation program in downstream villages	MOF	Fishery Dept. Contractor

NAM NGIEP - 1 *Hydroelectric Power Project*

ESTIMATED BUDGET FOR PROPOSED MEASURES

Measures during Filling

- 7 measures
- Budget: FSL360 ('000 US\$): 599
- FSL320 ('000 US\$): 499

EMP

NAM NGIEP - 1 *Hydroelectric Power Project*

MEASURES DURING OPERATION (years 1-5)

E1	Provide operation budget for EMU	GOLOEV	STENO
E2	Water quality monitoring	EMU	Vietnam Laboratory
E3	Specific monitoring of released water quality	STENO	EMU Consulting
E4	Management of the filling event (2nd year)	EMU	Consulting Contractor
E5	Evaluation of compensation for loss of river bank gardens, of existing irrigation facilities	STENO	EMU

NAM NGIEP - I *Hydroelectric Power Project*

MEASURES DURING OPERATION (years 1-5)

E5	Provision for compensation for loss of river bank gardens & existing irrigation facilities	OOL	EMU
E7	Monitoring of downstream fisheries	EMU	Fishery Dept.
E9	Development of irrigation in the downstream area	MOAF	Irri. Dept. Contractor
E9	Compensate for lost biodiversity by annual contribution to environmental trust fund 7	OOL	EDL or DEV
E10	Implementation of watershed management plan for aspects related to Project	OOL	EDL or DEV

NAM NGIEP - I *Hydroelectric Power Project*

MEASURES DURING OPERATION (years 6+)

F1	Water quality monitoring	EMU	Water Lab.
F2	Compensate for lost biodiversity by annual contribution to environmental trust fund 7	OOL	EDL or DEV
F3	Implementation of watershed management plan	OOL	MOAF
F4	Implementation of commercial fisheries program in the reservoir	OOL/DEV	MOAF
F5	Implementation of fish culture in the reservoir	OOL/DEV	MOAF, Private sector

NAM NGIEP - I *Hydroelectric Power Project*

ESTIMATED BUDGET FOR PROPOSED MEASURES

Measures during Operation

- 15 long term measures
- Budget: FSL360 ('000 US\$): 549
- FSL320 ('000 US\$): 519

EMP

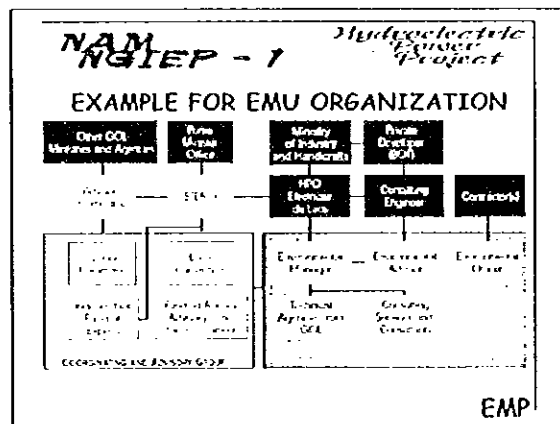
NAM NGIEP - I *Hydroelectric Power Project*

TOTAL ESTIMATED BUDGET FOR ENVIRONMENTAL MANAGEMENT PLAN (including first 5 years operation)

FSL360: Million US\$ 10.6

FSL320: Million US\$ 7.7

EMP



NAM NGIEP - I *Hydroelectric Power Project*

5

CONCLUSIONS

NAM NGIEP - I *Hydroelectric Power Project*

BEST ALTERNATIVE FROM THE ENVIRONMENTAL POINT OF VIEW...

IMPACTS OR EFFECTS (IZ)	360	320
Land area affected		
Forest area affected		
Forest production loss		
Carbon sequestration loss		
Agricultural area flooded		
Wildlife & Biodiversity		

NAM NGIEP - I *Hydroelectric Power Project*

BEST ALTERNATIVE FROM THE ENVIRONMENTAL POINT OF VIEW...

IMPACTS OR EFFECTS (IZ)	360	320
Drawdown area potential	■	■■
Residence time of water		
Reservoir stratification risk		
Short term water quality		
Medium term water quality		
Long term water quality		

NAM NGIEP - I *Hydroelectric Power Project*

BEST ALTERNATIVE FROM THE ENVIRONMENTAL POINT OF VIEW...

IMPACTS OR EFFECTS (IZ)	360	320
Long Term fisheries potential	■■	■
Sensitivity to sedimentation		
Sensitivity to backwater effects		
Cost of mitigation measures		

NAM NGIEP - I *Hydroelectric Power Project*

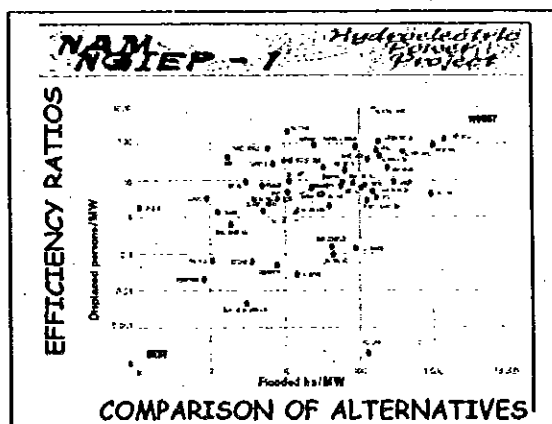
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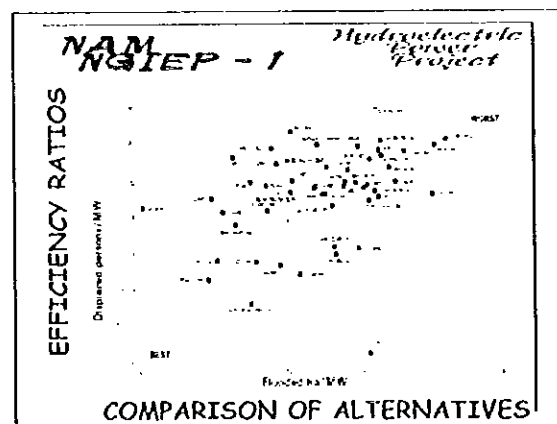
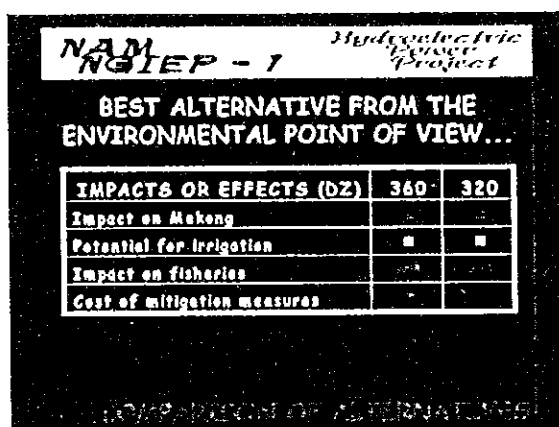
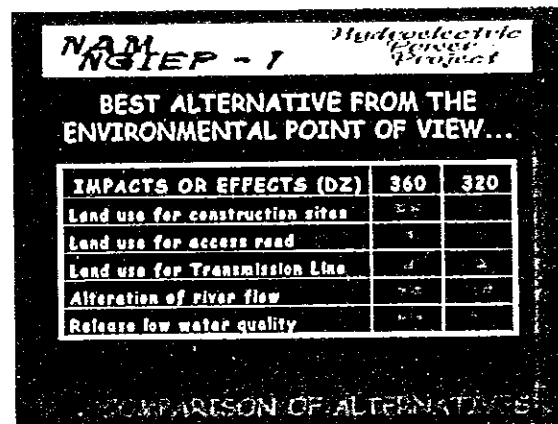
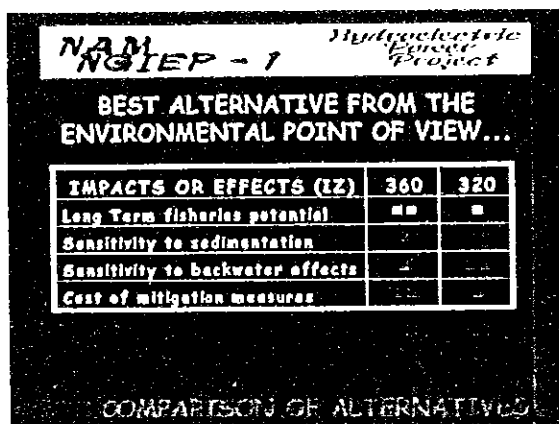
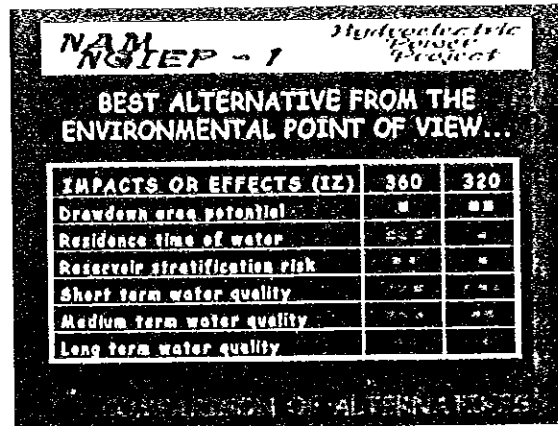
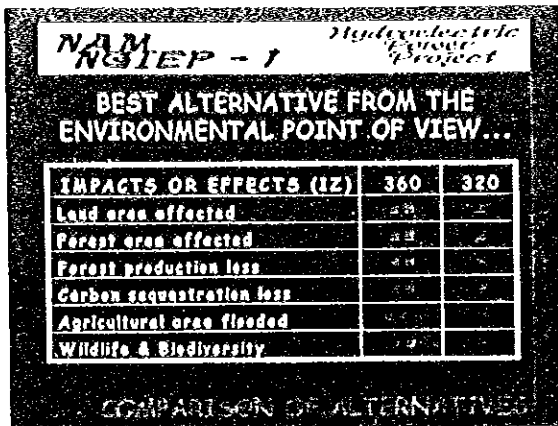
IMPACTS OR EFFECTS (DZ)	360	320
Land use for construction sites		
Land use for access road		
Land use for Transmission Line		
Alteration of river flow		
Release low water quality		

NAM NGIEP - I *Hydroelectric Power Project*

BEST ALTERNATIVE FROM THE ENVIRONMENTAL POINT OF VIEW...

IMPACTS OR EFFECTS (DZ)	360	320
Impact on Mekong		
Potential for irrigation	■	■
Impact on fisheries		
Cost of mitigation measures		





NAM NGIEP - I *Hydroelectric Power Project*

FROM THE ENVIRONMENTAL POINT OF VIEW, BOTH ALTERNATIVES ARE ACCEPTABLE
but

FSL 320 MINIMIZES IMPACTS AND MUST BE PREFERRED IF ECONOMICALLY VIABLE

NAM NGIEP - I *Hydroelectric Power Project*

THANK YOU FOR YOUR ATTENTION

END OF THE PRESENTATION

NAM NGIEP - I Hydroelectric Project

FROM THE ENVIRONMENTAL POINT
OF VIEW, BOTH ALTERNATIVES ARE
ACCEPTABLE
but

FSL 320 MINIMIZES IMPACTS
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NAM NGIEP - I Hydroelectric Project

THANK YOU
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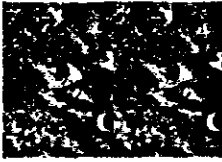
END OF THE PRESENTATION

4th PRESENTER

SOCIAL ENVIRONMENTALIST : T. RAGSDALE

HEPP - I *Hydro-Electric Power Project*

3RD GENERAL WORKSHOP



1. PRESENTATION
2. REVIEW OF PROJECT AREA
3. RESETTLEMENT SITES
4. RESETTLEMENT PLANNING
5. WHAT IS NEXT?
6. CONCLUSION

HEPP - I *Hydro-Electric Power Project*

PRESENTATION

1. WHAT WE HAVE DONE
2. REVIEW OF PROJECT AREA
3. RESETTLEMENT SITES
4. RESETTLEMENT PLANNING
5. WHAT IS NEXT?
6. CONCLUSION

HEPP - I *Hydro-Electric Power Project*

1. WHAT WE HAVE DONE

MILESTONE EVENTS IN JICA NINHP 1 FEASIBILITY STUDY

- RECONNAISSANCE FIELD VISIT AUGUST 25-28, 1998
 - ◊ Inception & Initial Environmental Examination (IEE)
 - ◊ Reservoir Area Population More Built Up Than Anticipated
- FIRST GENERAL WORKSHOP, VIENTIANE NOVEMBER 26 AND 27, 1998
 - ◊ Presented the Inception and IEE Reports
 - ◊ All Major Stakeholders, 89 Persons

HEPP - I *Hydro-Electric Power Project*

MILESTONE EVENTS IN JICA NINHP 1 FEASIBILITY STUDY

- UPPER & LOWER RESERVOIR AREAS SITE WORKSHOPS MARCH 16 AND 17, 1999
 - ◊ B. Dong 48 villagers from 13 villages - Wished for the lower dam alternative (318-320 meters)
 - ◊ B. Sayyuk 23 villagers - Want the Conditions of Resettlement to Conform Documents with Official Signatures
- Primary Message
 - ◊ Project in Early Study Phase
 - ◊ Could Possibly Not Be Built
 - ◊ Or If Built Not Until About A Decade

HEPP - I *Hydro-Electric Power Project*

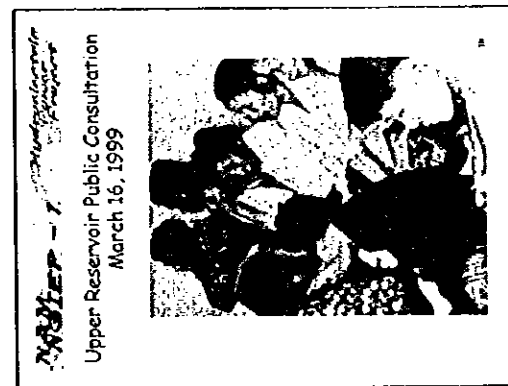
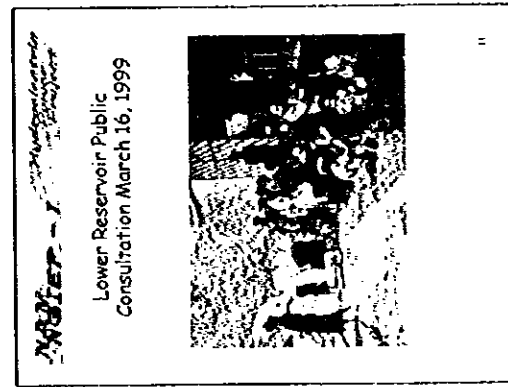
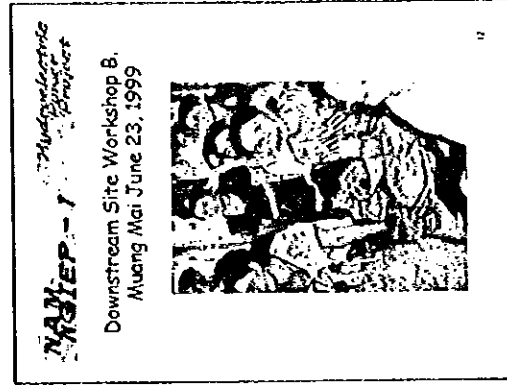
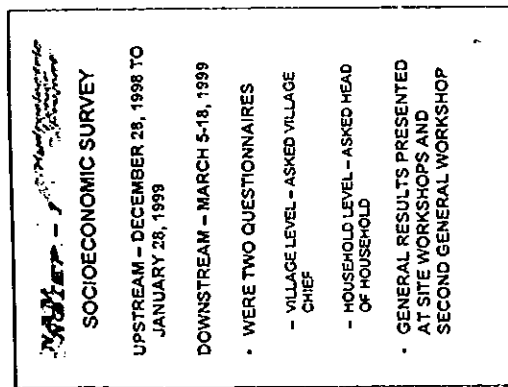
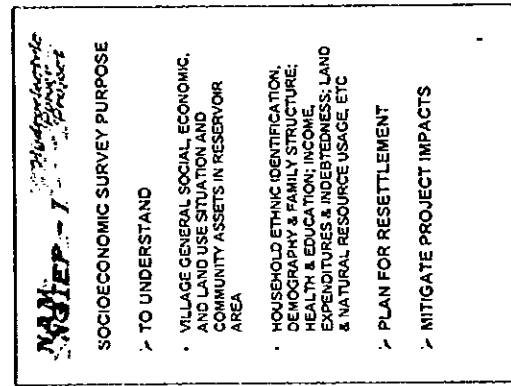
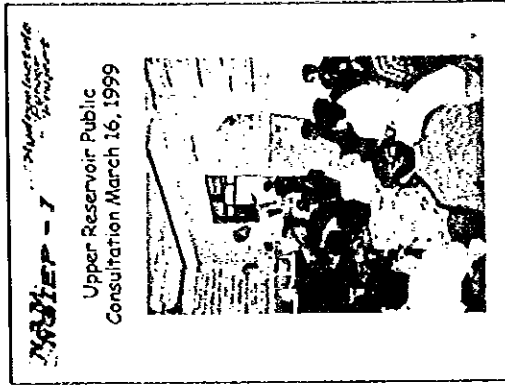
MILESTONE EVENTS IN JICA NINHP 1 FEASIBILITY STUDY

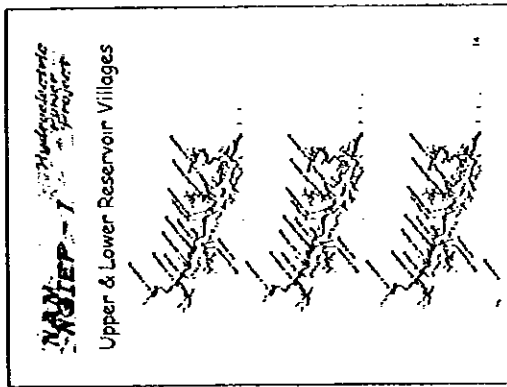
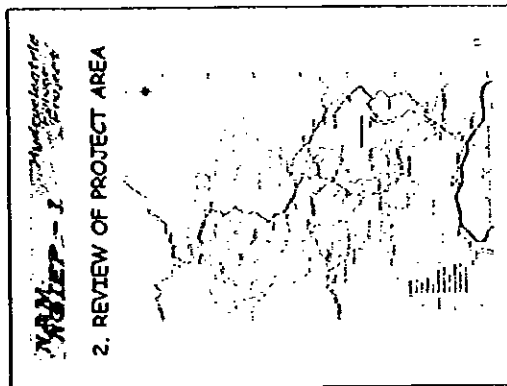
- SECOND GENERAL WORKSHOP PAKKAN JUNE 9-11, 1999
 - ◊ Draft EIA, Socioeconomic Survey Findings, Initial PPP
 - ◊ About 100 Stakeholder Attendees, Including from Reservoir Area

HEPP - I *Hydro-Electric Power Project*

MILESTONE EVENTS IN JICA NINHP 1 FEASIBILITY STUDY

- DOWNSTREAM SITE WORKSHOP 8. MAUNG MAI - JUNE 23-24, 1999
- PRELIMINARY INVENTORY OF 16 POTENTIAL RESETTLEMENT SITES JULY - AUGUST 1999
- HELICOPTER OVERVIEW OCTOBER 2 1999
- THIRD GENERAL WORKSHOP DECEMBER 9-11th





Upper Reservoir

Village	Households	Population	Cum. (m)
B. Phouaboum	67	375	346
B. Namlong	17	107	344
B. Xangphong	29	247	342
B. Nakhong	25	132	335
B. Nakhong	75	444	342
B. Vangphong	44	273	339
B. Nakhong	22	125	332
B. Namlong	81	522	350
B. Phouyong	63	349	328
B. Dong	82	509	327
B. Phouaboum	27	174	326
B. Phongsavath	49	322	323
B. Phou	44	414	319
Sub Total	689	3,997	

Lower Reservoir

B. Housayphann	16	127	275
B. Namphouk	86	940	271
B. Sengphouk	23	132	261
B. Sengphouk	67	408	246
Sub Total	194	1,207	
360 m TOTAL	883	5,204	393,345,000
350 m TOTAL	740	3,623	97,000,000

Total Project Affected People (PAPs)

UPSTREAM OF DAM

Upper Reservoir
13 Villages
659 Households
3,997 Persons

Lower Reservoir
4 Villages
194 Households
1,207 Persons

Reservoir Total
17 Villages
853 Households
5,204 Persons

Total Project Affected People (PAPs)

DOWNSTREAM OF DAM
Boikhan District

5 Villages
680 Households
3,980 Persons

Pakxan District
10 Villages
599 Households
2,856 Persons

Total Downstream
15 Villages
1,279 Households
6,836 Persons

Total Project Affected People (PAPs)

Total for Project
32 Villages
2,132 Households
12,040 Persons

Transmission Lines
Access Road
To be determined

NRIET - 1 *Thailand-Vietnam*
ADMINISTRATIVE AREAS
 ENTIRE RESERVOIR AREA WITHIN
 KHETZISET (SPECIAL ZONE)
 XAYSOMBOON

18

NRIET - 1 *Thailand-Vietnam*
XAYSOMBOON

- Was Part Of Vientiane And Xieng Khouang Provinces, Xaysomboon
- Set Up July 23, 1994 for Special Preference For Community Development
- Population 57,300 Mostly Lao Sung National Minority, 137 Villages, 8,264 HH
- Geography 7,105 Sq Km Very Rough And Mountainous
- Lowest Population Density In The Lao PDR, 8 Persons Per Square Kilometer Compared To 20 Persons For Lao PDR

20

NRIET - 1 *Thailand-Vietnam*
XAYSOMBOON

LOWEST OR SECOND TO LOWEST ON MOST SOCIAL INDICATORS

- Total Fertility
- Birth Rate
- Death Rate
- Infant Mortality
- 3% Rate of Natural Population Increase, Compared to Lao 2.5 %
- Lowest Distribution of Population in Urban Areas

21

NRIET - 1 *Thailand-Vietnam*
UPPER RESERVOIR AREA WITHIN
THATHOM DISTRICT,
XAYSOMBOON

- 7,500 People In 33 Villages. Second Lowest Population In Xaysomboon
- Targeted 'Priority District For Development'
- Population Increasing Due To The Relocation Of People From Xieng Khouang And Houaphan Provinces
- Present National Route 4 (NR4) To Be Upgraded To 1,000km National Road 1 from China to Cambodia

22

NRIET - 1 *Thailand-Vietnam*
THAVIANG SUB-DISTRICT OF
THATHOM DISTRICT

- Junction Of Planned NRI And NR5, Linking Thailand & Vietnam
- ADB-Financed Power Transmission And Distribution Project Along NR4, Completion Date December 31st, 2001
- National Focal Area For Rural Development (FARD), Making It A Resettlement Receiving Area For Highland Populations
- 130-200 Ha Of Irrigated Rice Paddy, With 75 Ha More Planned

23

NRIET - 1 *Thailand-Vietnam*
NATIONAL HIGHWAY PLAN

24

HEPP-1 Hydropower Development Project

RURAL ELECTRIFICATION

MAP ILLUSTRATION OF RURAL ELECTRIFICATION

HEPP-1 Hydropower Development Project

B. DONG, ADMINISTRATIVE HEADQUARTERS, TAVZIANG

HEPP-1 Hydropower Development Project

B. Pou and Naphang Looking Upstream

HEPP-1 Hydropower Development Project

LOWER RESERVOIR AREA WITHIN HOM DISTRICT, XAYSOMBOON

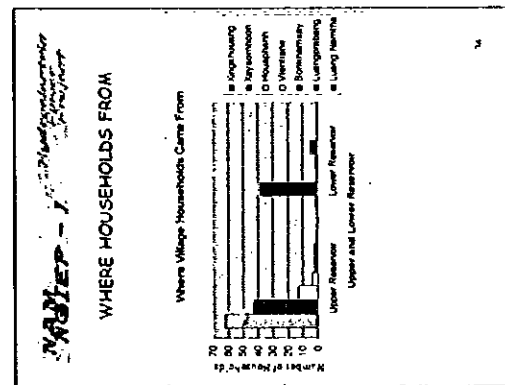
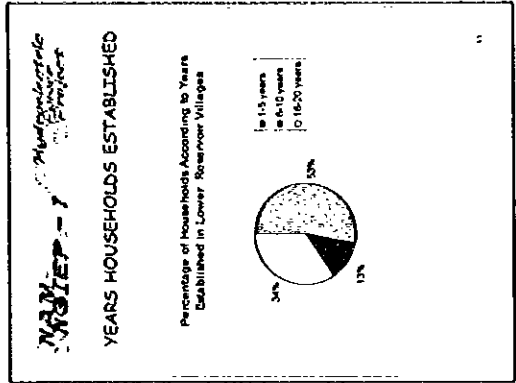
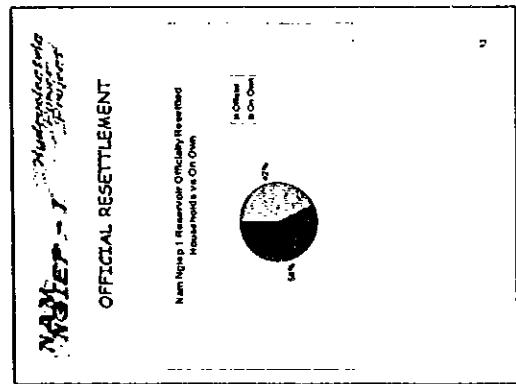
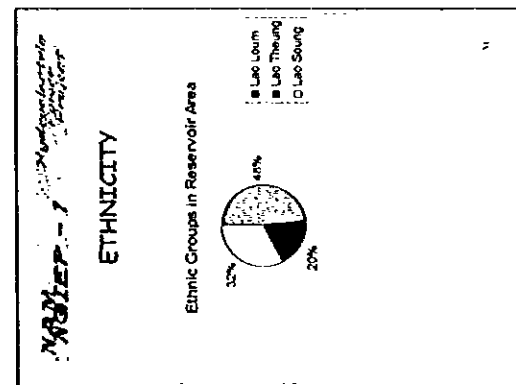
- 6,600 People, 31 Villages, Least Populated District In Xaysomboon
- 90 % Lao Savng
- Road to B. Hom Often Washed Away During The Wet Season And Unsafe To Travel Due To Security Problems
- UNDP Muang Hom Integrated Agricultural Development Project 1980s to 1994
- Japan donated Primary Schools in 2 villages of Lower Reservoir

HEPP-1 Hydropower Development Project

B. Sop Youk Looking Upstream

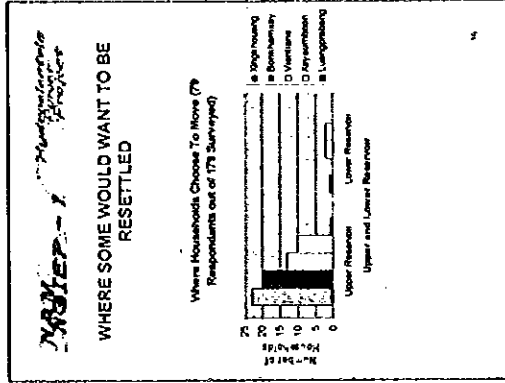
HEPP-1 Hydropower Development Project

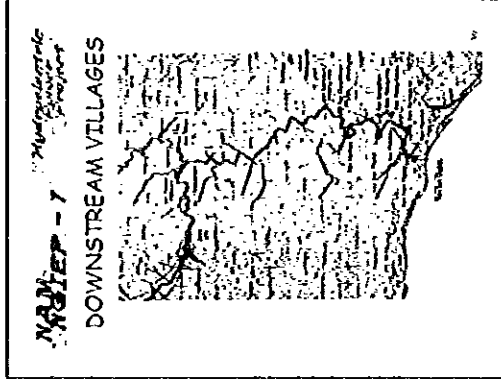
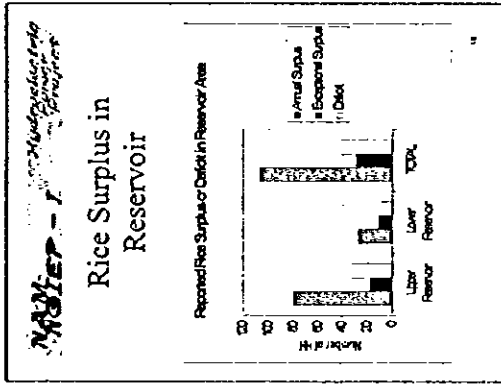
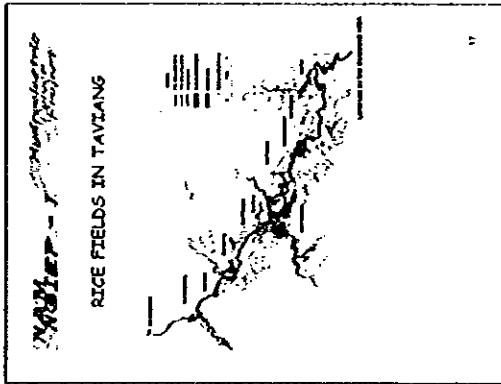
B. Soppouh



INMIGRATION

- HOUSEHOLDS FROM 23 DIFFERENT DISTRICTS IN THE 7 NORTHERN PROVINCES
 - Xiang Khouang, Xaysonboum, Houaphanh, Bolikhamsay, Viengthay, Luang Namtha, and Luang Prabang
- MOST UPPER RESERVOIR HOUSEHOLDS FROM XIENKOUANG
- MOST LOWER RESERVOIR HOUSEHOLDS FROM XAYSONBOON

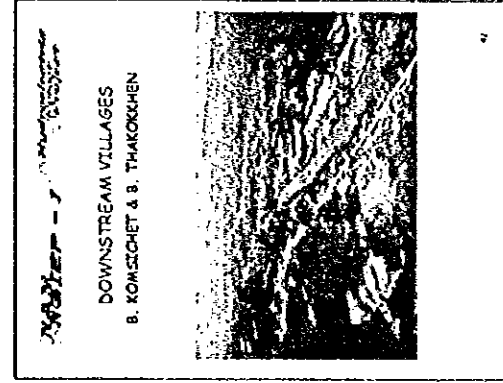
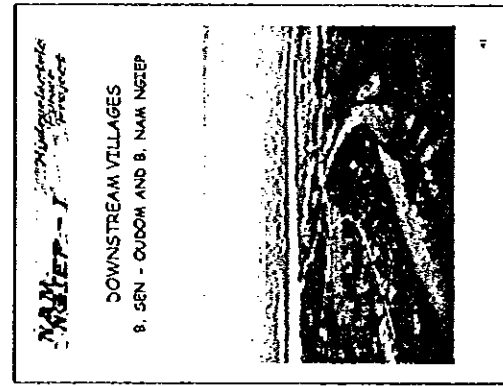




NGIEP - I *Nam Ngiep-I Project*


DOWNSTREAM VILLAGES

Baithan District	Households	Population
Jet Cham	88	533
Tihsa	99	252
Sensum	185	1,134
Nam Pa	71	427
Heavy Kam	281	1,632
Sub Total /	680	3,980
Palae District		
Nang - Dang	19	312
Thang - Hai	50	329
Thang - Gai	62	340
Song Cham	42	239
Phay Jiam	44	276
Thakabhae	36	349
Nam Pa	39	203
Nam Nang	67	311
Sak Oudom	67	314
Samkhan	147	543
Sub Total /	599	2,856
TOTAL	1,279	6,836



HEPP - 3

DOWNSTREAM VILLAGES
8. AVUANG MAI & RESETTLEMENT SITE D3 (130 HH)



41

HEPP - 3

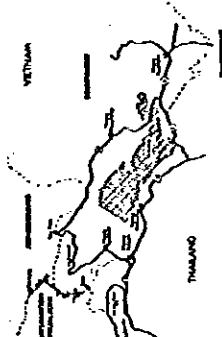
DOWNSTREAM VILLAGES

- 91% LAO LOUM
- 1% LAO SOUNG
- PAIXAN PROVINCIAL HEADQUARTERS
- HIGHWAY 13 FROM VIENTIANE ALONG MEKONG
- ECONOMIC DEVELOPMENT & GROWING POPULATION

42

HEPP - 3


BOLIXHAMXAY ROADS



43

HEPP - 3

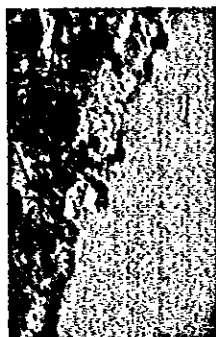
BOLIXHAMXAY PLANNING



44

HEPP - 3

IRRIGATION PUMP ON NAM NGIEP



45

HEPP - 3

3. RESETTLEMENT SITES

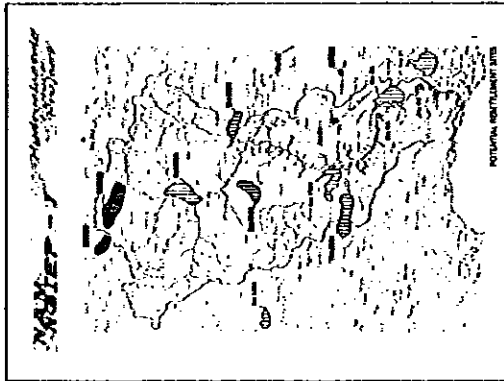
PRELIMINARY INVENTORY OF POTENTIAL RESETTLEMENT SITES

- Mid July to mid August 1999 by STS Consultants
- Identified 16 Potential Sites

46

PRELIMINARY INVENTORY OF POTENTIAL RESETTLEMENT SITES

- Interviews with Provincial & District Officials
- Aerial Photos (1:30,000 taken in 1998)
- Topographic Maps at a 1:100,000, 1:50,000 and 1:25,000 Scale
- Desk Study of this Time, No Ground Truthing
- Helicopter overview of Southern Sites October 99



RESETTLEMENT SITES INITIAL ASSUMPTIONS

- Initial Prioritizing based on Cultural Preference for Irrigated Rice
- 1 hectare of paddy field and 0.5 hectares for housing, garden and other facilities
- Grazing lands not taken into account at this stage
- 50% of relatively flat land classified as 'unspoiled' forest would be suitable for paddy development
- Water Sources for Irrigation Identified at each Site

RESETTLEMENT SITE FINDINGS

- These Potential Sites Most Attractive
 - D1 on Nam Xan near Bolikhon District Headquarters (1,500 Households)
 - D2 some 45 km near NR 4 to East of Bolikhon District Headquarters (450 Households)
 - XX3 North East 40 km or so along NR 4 from Xieng Khuang Provincial Headquarters (1,300 Households)
- Potential for 3,500 Households at these 3 Sites

OTHER CRITERIA FOR RESETTLEMENT SITES

- Greater potential for Paddy Development
- Close to Administration Center near Populated Areas that could provide other earning opportunities
- Within the Focal Area for Rural Development (FARD) of either the concerned District or Province
- Were Suggested by Local Authorities

OTHER CRITERIA FOR RESETTLEMENT SITES

- Greater potential for Paddy Development
- Close to Administration Center near Populated Areas that could provide other earning opportunities
- Within the Focal Area for Rural Development (FARD) of either the concerned District or Province
- Were Suggested by Local Authorities

RESETTLEMENT SITES

- Overall around 3,900 Household Potential at 16 Sites based Saliety on Irrigated Rice Potential
- 9 Sites in South Visited by Helicopter Overview October 2, 1999
- Future Field Studies to Include
 - Technical investigation of soil suitability and water availability for agricultural development, particularly of irrigation development, Cattle, etc
 - The prevailing socio-economic, tenure and cultural conditions of the proposed sites
 - Feasibility Studies of Other Livelihood Packages at the Sites

**VISITED BY HELICOPTER
OCTOBER 2, 1999**

RESETTLEMENT SITES TOPO MAP

RESETTLEMENT SITES LAND USE

RESETTLEMENT SITE D1

RESETTLEMENT SITE D1

- Proposed by District authorities as Fossil Area for Rural Development (FRD)
- On Nam Xan River
- 5 Lao Loun villages
- Good road
- Flat to gently undulated terrain with several swamps and natural ponds, 130-160 MSL
- Unprotected forests (2500 Ha) relatively flat and can be developed as paddy land
- Water Sources Nam Xan & Heuy Sa, flow into Nam Xong (Naklong) & natural ponds such as Nam Yang, Nam Koi and Nam Koy

4. RESETTLEMENT PLANNING

- Preliminary Resettlement Plan (PRP) at this 1st Stage of Feasibility Study
- Will Develop Draft Resettlement Action Plan (RAP) at 2nd Stage, once Design Finalized 360m or 320m - 2 Year Process
- Detailed Design Phase a Final RAP - 2 to 3 Year Process

RESETTLEMENT PLANNING

NNHP RAP PRINCIPLES AND OBJECTIVES

- AVOID OR MINIMIZE INVOLUNTARY DISPLACEMENT
- COMPENSATE AND RESETTLED PEOPLE (PAPS) TO IMPROVE THEIR LIVING STANDARDS
- PLAN AND IMPLEMENT LAND ACQUISITION AND RESETTLEMENT TO CAUSE LEAST POSSIBLE SOCIAL, CULTURAL AND ECONOMIC DISRUPTION
- COMPENSATE PAPS AT FULL REPLACEMENT COST PRIOR TO RELOCATION; ASSIST IN THE TRANSFER OF RESIDENCE; ASSIST IN IMPROVING LIVING STANDARDS AT THE NEW LOCATION
- RESPECT & PRESERVE EXISTING CULTURAL AND RELIGIOUS PRACTICES
- PROTECT SOCIALLY AND ECONOMICALLY VULNERABLE GROUPS

RESETTLEMENT PLANNING

NNHP RAP PRINCIPLES AND OBJECTIVES

- CONSIDER ALL PERSONS RESIDING IN PROJECT AREA PRIOR TO A FORMALLY RECOGNIZED CUT OFF DATE AS PAPS
- LACK OF LEGAL TITLES TO THE LAND A PERSON IS CULTIVATING OR TO THE PLACE RESIDENCE NOT A BAR TO RESETTLEMENT ENTITLEMENTS
- IMPROVE PREVIOUS LEVEL OF COMMUNITY SERVICES AND RESOURCES AFTER RESETTLEMENT
- BUDGET ENTIRE COST OF RAP AS INTEGRAL PART OF PROJECT COST, IN ANNUAL AND OVERALL IMPLEMENTATION PLANS OF PROJECT

RESETTLEMENT PLANNING

NNHP RAP PRINCIPLES AND OBJECTIVES

- PLAN AND IMPLEMENT RAP WITH CONSENT AND AGREEMENT OF PAPS AND ENCOURAGE THEIR ACTIVE PARTICIPATION
- ESTABLISH EFFECTIVE MECHANISMS FOR HEARING AND RESOLVING GRIEVANCES DURING IMPLEMENTATION OF RAP

RESETTLEMENT PLANNING

OUTLINE OF RP WILL BE ELEMENTS OF RAP, FURTHER DEVELOPED

- BACKGROUND PROJECT
- REGIONAL CONTEXT
- BASIS FOR PLANNING
- LEGAL FRAMEWORK
- RESETTLEMENT ACTION PLAN
- COMPENSATION COST ESTIMATE AND BUDGET
- INSTITUTIONAL FRAMEWORK
- PARTICIPATION AND CONSULTATION
- GRIEVANCE AND APPEALS
- MONITORING
- REPORTING
- ENTITLEMENT MATRIX
- ENVIRONMENTAL IMPACTS AND RESTORATION

RESETTLEMENT PLANNING

Compensation for Lost Assets, Housing, Land, Etc.

- Based on Inventory of Existing Assets and will be a Substantial Improvement over Present Assets (Electricity, Roads, Water Systems, Houses, etc)
- Budget will be developed on this basis, Already Begun but Finalized in Detailed Planning Stage

RESETTLEMENT PLANNING

INCOME RESTORATION

- REASSEMBLING LOST PRODUCTION SYSTEMS A COMPLEX AND DIFFICULT TASK, REQUIRING
 - Specialists from a Diverse Set of Backgrounds
 - Requires full participation of the resettlers themselves in planning and implementing schemes
- "DEVELOPMENT" RESETTLEMENT

RESETTLEMENT PLANNING

INCOME RESTORATION

- May be Useful to Explore using NGOs with Rural Development Experience
- Experience Working with Mass Organizations (Lao Women's Union) and Formal, Informal Village Organizations
- Bottom Up Approach
- Experience in FARs
- Will Need to Resolve Security Issues for Xoysoomboon in next Phase

RESETTLEMENT PLANNING

INCOME RESTORATION

- In 1997 were 53 International NGOs active in the Lao PDR, US\$18 m since beginning of involvement with adoption of New Economic Mechanism in 1986
- Active in:
 - Agriculture, Forestry, Fisheries
 - Area Development
 - Economic Development
 - Health
 - Human Resources Development
- 23 NGOs active in these fields in Xieng Khouang, Bolikhamsay & Vientiane Provinces

INCOME RESTORATION PACKAGES TO BE DESIGNED IN NEXT PHASE

- IRIGATED RICE
- FORESTRY
- ORCHARDS AND NON-TIMBER FOREST PRODUCTS (NTFP)
- FLOATING NET CAGE RESERVOIR FISHERIES
- DAIRY AND/OR LIVESTOCK PRODUCTION
- TOURISM
- TRAINING
 - TRAINING FOR CONSTRUCTION WORK WITH THE PROJECT
 - SCHOLARSHIPS
 - AGRICULTURAL TECHNOLOGY
 - VOCATIONAL SKILLS TRAINING

Project Area Potential Land Use

Drawdown for 320 m 4,110 ha Maximum

- 4 mo - rice growing 1500-2000 ha
- 5 mo - 1,000-2,000 ha (grazing)

RAP ORGANIZATION

WORLD BANK AND ADB POLICY ON INDIGENOUS PEOPLES

- INDIGENOUS PEOPLES DEVELOPMENT PLAN (IPDP) IS FREQUENTLY REQUIRED
- SOCIAL GROUPS WITH A SOCIAL AND CULTURAL IDENTITY THAT IS DISTINCT FROM THE DOMINANT SOCIETY
- POLICY OBJECTIVES
 - DEVELOPMENT PROGRAMS ARE SOCIALLY AND CULTURALLY COMPATIBLE WITH INDIGENOUS PEOPLES
 - INFORMED PARTICIPATION OF THESE GROUPS AND
 - INDIGENOUS PEOPLE DO NOT SUFFER FROM ADVERSE IMPACTS

LAOS OFFICIALLY A MULTIETHNIC NATION WITH MORE THAN FORTY ETHNIC GROUPS CLASSIFIED INTO THREE GENERAL FAMILIES

Ethnicity for Lao PDR

Ethnic Group	Percentage
Lao Loum	10%
Lao Theung	24%
Lao Soung	66%

INDIGENOUS PEOPLES IN PROTECT AREA

LAO LOUM

- ◊ MAINSTREAM ETHNIC LAO
 - House-Based Society, Which Means That The Household and/or The Village Rather Than Any Descend Group Is The Basic Social Unit
- ◊ PHUAN
 - Many Formerly Migrated from Kingdom Of Xiang Khawang In 19th Century
- ◊ LAO MEU (Tai Dam)
 - Differ From Other Lowland Groups In Social Organization And Religion

INDIGENOUS PEOPLES IN PROTECT AREA

LAO THEUNG

- ◊ KHAMU OU
 - Descendants Of The Aboriginal Mon-Khmer Speaking Population Largest Minority Population ~500,000


LAO SOUNG (HONG)

- ◊ HONG LAY (GREEN, OR STRIPPED HONG)
- ◊ HONG KHAO (WHITE HONG)
 - Ancestral Aboriginal Tribesmen Of The Mainland Of Southern China ~ 250,000 In Lao PDR
 - Social Structure Around 18 Clans
 - Distinct Physical Features, i.e. Children Belong To Same Clan As Their Father

UXO EFFECTS ACROSS LAO PDR

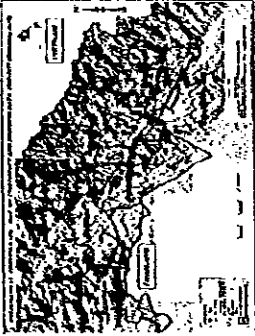
UXO Impacts on Xaysomboon

UXO Impacts on Xieng Khouang



7

UXO Impacts on Bolikhamxay



Mitigation = Reconnaissance Surveys Resettlement Sites

8

RESETTLEMENT PLANNING SUMMARY

IMPACTS & ESTIMATED RAP COST:

Dist. Size	MH	Persons	Est. RAP Budget
360 m	853	5,204	\$23,345,000
320 m	260	1,623	\$7,000,000

ROUGH SCHEDULE:

- 2 Years Feasibility Studies
- 2-3 Years Technical Design for RAP
- 5-6 Years Project Construction/RAP Implementation
- 1-3 Years Monitoring & Evaluation of RAP
- 6-20 Years Follow Up Evaluation of Income Generation

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5. WHAT IS NEXT?

End of Next Year, Start 2nd Phase of Feasibility Studies - 2 Year Process for Social Action Plan (SAP) and RAP

- SOCIO-CULTURAL ASSESSMENT OF RESETTLEMENT AND HOST COMMUNITIES
- PREPARATION OF A PUBLIC CONSULTATION FRAMEWORK (GENDER)
- CAPACITY ASSESSMENT OF RESETTLEMENT SITES
- BACKWATER AND SEDIMENTATION MODELING
- ARCHEOLOGICAL REVIEW AND FIELD SURVEY
- TECHNICAL RESOURCES EXPLORED AND DETAILED FOR DEVELOPMENT OF LIVELIHOOD PACKAGES PREPARED

12

Then Start Detailed Design Phase - 2-3 Year Process

- Detailed Design of Livelihood Packages
- Detailed Census of Population and Inundation Loss of Assets and Natural Resources, including Detailed Land Tenure Survey
- New Village Design, including access roads, electricity, water, infrastructure, housing and community layout of resettlers' choice, and other features determined through community consultation
- Livestock Transport And Health Program Design

13

DETAILED DESIGN PHASE

- Pre Resettlement Health Program Design, with focus on maternal and child health, elderly, handicapped and otherwise vulnerable persons
- AIDS/HIV Awareness And Prevention Program, with focus on construction sites and surrounding areas
- Estimates of land and population affected by Transmission Line(s) and Access Roads and formulation of compensation plan for affected persons

14

HEPP - I

DETAILED DESIGN PHASE

- Environmental Impact Assessment (EIA) of RAP
- UXO Reconnaissance and, as Necessary, Clearance of Resettlement Sites
- Other studies and program design activities, with TOIs and coets will be determined during preparation of the Social Action Plan (SAP) for Project Affected Persons (PAPs) other than Resettlers
- Watershed Management cum Regional Development Plan
- Studies Approximately US\$600 to 1 Million depending on 330 m or 360 m alternative, not including EIA studies

HEPP - I

6. CONCLUSIONS

- From Resettlement Point of View, Both Alternatives Appear Feasible
- However, International Policies Emphasize Minimizing Resettlement Whenever Possible, so 320 m Preferred, assuming Project Financial and Economic Viability at this Level

HEPP - I

CONCLUSIONS

If 360 m Chosen, Will be Difficult Due to:

- FARD, Newly and Officially Developed Area
- UXO Contamination in Xaysomboon and Xieng Khouanijg
- Logistics of Developing Two Sites
- Security Issues

HEPP - I

CONCLUSIONS

- From Social Impacts Aspect, 320 m Option Recommended
- However, Dam Height Chosen Must be GOL Decision, based on All Factors

HEPP - I

THE END

THANK YOU FOR YOUR KIND ATTENTION

4. SITE WORKSHOP

4.1 1ST SITE WORKSHOP

4.1.1 PROGRAM AND ATTENDANCE LIST

The Nam Ngiep-I Hydroelectric Power Project

ACTUAL PROGRAM
ON
SITE WORKSHOP FOR INCEPTION REPORT

1st Place in B.Dong (March 16, 1999)

No.	From	To	Agenda	Contents	Presenter/Staff
	08:40	09:20	Preparation	Panel Setting	HPO Staff
1.	09:20	09:25	Introduct. of Participants	-	Facilitator
2.	09:25	09:30	Opening Speech	Power policy in Lao	HPO, Mr.Somboune
3.	09:30	09:40	Introduction of JICA	JICA's policy & Study	S/Team, Mr.Araki
4.	09:40	09:50	Scene 1	Orientation of Workshop	Facilitator
5.	09:50	09:55	Scene 2	Background of Project	S/Team, Mr.Araki
6.	09:55	10:10	Scene 3	Hydropower	S/Team, Mr.Yon
7.	10:10	10:25	Discussion (1)		Facilitator
8.	10:25	10:40	Break		
9.	10:40	11:00	Scene 4 & 5	Issues of reservoir	S/Team, Mr.Ragsdale
10.	11:00	11:10	Discussion (2)		Facilitator
11.	11:10	11:25	Scene 6	Issues of Downstream	S/Team, Mr.Yon
12.	11:25	11:45	Discussion (3)		Facilitator
13.	11:45	12:00	Scene 7 & 8	Construction & Benefits	S/Team, Mr.Ragsdale
14.	12:00	12:25	Discussion (4)		Facilitator
15.	12:25	12:40	Closing Speech	Deputy Governor of Xaisoune S/Zone	Mr. Siboumtham
16.	13:00	13:30	Lunch		

2nd Place in B.Sopyouk (March 17, 1999)

No.	From	To	Agenda	Contents	Presenter/Staff
	08:40	09:15	Preparation	Panel Setting	HPO Staff
1.	09:15	09:20	Scene 1	Orientation of Workshop	Facilitator
2.	09:20	09:25	Opening Speech	Cooperation of Study	Deputy Governor of Xaisoune S/Zone, Mr. Siboumtham
3.	09:25	09:30	Opening Speech	Power policy in Lao	HPO, Mr.Somboune
4.	09:30	09:40	Introduction of JICA	JICA's policy & Study	S/Team, Mr.Araki
5.	09:40	09:50	Scene 2	Background of Project	S/Team, Mr.Araki
6.	09:50	10:00	Scene 3	Hydropower	S/Team, Mr.Yon
7.	10:00	10:05	Discussion (1)		Facilitator
8.	10:05	10:25	Scene 4 & 5	Issues of reservoir	S/Team, Mr.Ragsdale
9.	10:25	10:40	Discussion (2)		Facilitator
10.	10:40	10:50	Break		
11.	10:50	11:10	Discussion (3)		Facilitator
12.	11:10	11:20	Scene 6	Issues of Downstream	S/Team, Mr.Yon
13.	11:20	11:25	Scene 7	Issues of Construction	S/Team, Mr.Yon
14.	11:25	11:35	Scene 8	Issues of Benefits	S/Team, Mr.Ragsdale
15.	11:35	11:40	Discussion (4)		Facilitator
16.	11:40	11:45	Closing Speech	Thanks for participants	HPO, Mr.Somboune
17.	11:45	11:50	Closing Speech	Thanks for participants	S/Team, Mr.Araki
18.	11:50	12:00	Closing Speech	Thanks for participants	Deputy Governor of Xaisoune S/Zone, Mr. Siboumtham
19.	12:20	13:30	Lunch		

**Nam Ngiep-I Hydroelectric Power Project
ATTENDANCE LIST
SITE WORKSHOP FOR INCEPTION REPORT**

1. Government

No.	Name	Position	Mar.16	Mar.17
1.	Mr. Somboune	Deputy Director, HPO	0	0
2.	Mr. Saynavat	STENO	0	0
3.	Mr. Chansaveng	Counterpart, HPO	0	0
4.	Mr. Semkhan	Counterpart, HPO	0	0
5.	Mr. Bouathep	Counterpart, HPO	0	0
6.	Mr. Sanhya	Counterpart, HPO	0	0

2. JICA, Study Team and others

No.	Name	Position	Mar.16	Mar.17
1.	Mr. M. Masaki	Project Formulation Advisor, JICA/Laos Office	X	0
2.	Mr. Y. Tada	Project Formulation Advisor, JICA/Laos Office	X	0
3.	Mr. Sophonh K.	Programme Officer, JICA/Laos Office	X	0
4.	Mr. H. Murashige	JICA Expert, HPO	X	0
5.	Mr. I. Araki	Team Leader, Study Team	0	0
6.	Mr. B. Yon	Natural Environmental Expert, Study Team	0	0
7.	Mr. T. Ragsdale	Social Environmental Expert, Study Team	0	0
8.	Mr. Michel	Facilitator (Canadian)	0	0
9.	Mr. Detmahinh	Interpreter (Laotian)	0	0
10.	Mr. Sysavit	Engineer of STS Consultants	0	0
11.	Mr. Khantam	Engineer of STS Consultants	0	0

3. Local Government

No.	Name	Position	Mar.16	Mar.17
Xaisomboun Province (Special Zone)				
1.	Mr. Siboumtham	Deputy Governor of Xaisomboun S/Zone	0	0
2.	Mr. Singkham	Head of Department of Industry & H.Craft	0	0
3.	Mr. Kalaket	Engineer of DIH	0	0
Thaviang District				
1.	Mr. Khamvaen	Head of Focal Site	0	X
2.	Mr. Bouneing	Deputy Head of Focal Site	0	X
Hom District				
1.	Mr. Suator	Deputy District Governor	X	0

4. Local People

No.	Name	Position	Mar.16	Mar.17
Villagers of Thaviang District (Total 48 peoples)				
1.	B.Xiengkong	6 peoples	0	X
2.	B.Viengthong	3 peoples	0	X
3.	B.Naxay	4 peoples	0	X
4.	B.Naxong	4 peoples	0	X
5.	B.Nahong	4 peoples	0	X
6.	B.Phonhom	2 peoples	0	X
7.	B.Phonyeng	5 peoples	0	X
8.	B.Dong	6 peoples	0	X
9.	B.Phiangta	6 peoples	0	X
10.	B.Hatsamkhone	2 peoples	0	X
11.	B.Pou & B.Naphang	4 peoples	0	X
12.	B.Nakang	2 peoples	0	X
Villagers of Hom District (Total 23 peoples)				
1.	B.Housypamom	4 peoples	X	0
2.	B.Sopphouh	2 peoples	X	0
3.	B.Namyouk	3 peoples	X	0
4.	B.Sopyouk	14 peoples	X	0

4. SITE WORKSHOP

4.1 1ST SITE WORKSHOP

4.1.2 QUESTIONNAIRES AND STUDY TEAM'S COMMENTS

Nam Ngiep-1 Hydroelectric Power Project
QUESTIONNAIRES PAPERS

AT

SITE WORKSHOP FOR INCEPTION REPORT

Site Workshop at Thaviang District on March 16, 1999

No.	Village	Name	Sex	Age	Position	Question							General Comments
						1	2	3	4	5	6	7	
1	Xiengkhone	Hai	M	35	Head of Youth Organization	Y	Y	Y	Y	-	Y	Y	I agree to build a dam at EL.320 m.
2	Naxong	Thethomma	M	48	Head of Village	Y	Y	Y	Y	Y	Y	Y	(1) I agree to build the Nam Ngiep-1 HEPP, because this project will be make income for country. (2) I agree to build a dam at FSL.320m, because this elevation has to resettle 4 villages.
3	Nasay	Lath	M	24	Head of Youth Organization	Y	Y	Y	Y	Y	Y	Y	I agree to build a dam at EL.320 m, because that elevation has a little impact and will save Thaviang area for irrigation.
4	Phonyeng	Khamveang Sorsamphunsay	M	54	Thaviang K.P	Y	Y	Y	-	-	Y	Y	I agree to build a dam at EL.320 m.
5	Huarphoung	Sibountham	M	45	Deputy Governor of Saysomboun Special Zone	Y	Y	Y	Y	Y	Y	Y	If you have finished to study the Natural Environment Nam Ngiep-1 build at EL.320 m.
6	Phonyeng	Douangta Bouthavong	M	47	Head of village	Y	Y	Y	-	Y	Y	Y	I agree with the Government plan to build a dam at EL.320 m.
7	Phonyeng	Thetkunha	M	52	Elders Representative	Y	Y	Y	Y	-	Y	Y	I agree with the Government plan to build a dam at EL.320 m
8	Phiangta	Khamhai	M	69	Elders Representative	Y	Y	Y	Y	Y	Y	Y	I agree to build a dam at EL.320 m, because we have to save the Thaviang subdistrict
9	Naxong	Doungta	M	57	-	Y	Y	Y	Y	Y	-	-	I agree to build a dam at EL.320 m because we have to save irrigation in Thaviang sub-district
10	Xiengkhone	Khamnor	M	65	Elders Representative	Y	Y	Y	Y	Y	Y	Y	I agree to build a dam at EL.320 m
11	Dong	Thongchan	M	67	-	Y	Y	Y	Y	Y	T	Y	I agree to build a dam at EL.320 m because we have to save irrigation and resources in Thaviang subdistrict
12	Nahong	Buarvanh	M	43	National Front	Y	Y	Y	Y	Y	T	Y	I agree to build a dam at EL.320 m The Project should continue to study because this project will develop social-economic condition of Lao P.D.R.
13	Hatsamkhone	Bouchane	M	50	Deputy head of village	Y	Y	-	-	-	-	-	I agree to study continue at EL.320 m.

SUPPORTING REPORT(V)

1st Site Workshop

14	Dong	Eam Kendala	M	40	Deputy Director of School	Y	Y	Y	Y	Y	Y	Y	Y	(1) I agree to build a dam at EL.320 m. (2) If the Government build a dam at EL.360 m, he has to resettle and compensate a lot. I agree to build the Nam Ngiep 1 HEPP at EL.320 m.
15	Naxong	Phune	M	28	Head of Youth Organization	Y	Y	Y	Y	Y	Y	Y	Y	I agree to build a dam at EL.320 m because that elevation has a little impact.
16	Nahong	Nouansi	M	42	Head of village	Y	Y	Y	Y	Y	Y	Y	Y	I agree to build a dam at EL.320 m. The Project should continue to study because this project will make income for Lao Government and local people.
17	Pou	Kongsi	M	42	Head of village	Y	Y	Y	Y	Y	Y	Y	Y	I agree to build a dam at EL.320 m because that elevation has a little impact.
18	Pou	Chane	F	70	Elders Representative	Y	Y	Y	Y	Y	Y	Y	Y	I agree to build a dam at EL.320 m because that elevation has a little impact.
19	Viengthong	Sing	M	24	Head of Youth Organization	Y	Y	Y	Y	Y	Y	Y	Y	I agree to build a dam at EL.320 m because that elevation has a little impact.
20	Phonhom	Thoumma	M	50	Head of village	Y	Y	Y	Y	Y	Y	Y	Y	I agree with EL.320 m.
21	Pou	Chanethepp	F	45	Lao Women Union	Y	Y	Y	Y	Y	Y	Y	Y	I agree to build a dam at EL.320 m because that elevation has a little impact.
22	Viengthong	Onsi	M	57	Elders Representative	Y	Y	Y	Y	Y	Y	Y	Y	(1) I do not agree with EL.360 m. (2) I agree with EL.320 m
23	Viengthong	Douangta	M	36	-	Y	Y	Y	Y	Y	Y	Y	Y	I agree to build a dam at EL.320 m because that elevation has a little impact.
24	Nahong	Somsi	M	37	Head of Youth Organization	Y	Y	Y	Y	Y	Y	Y	Y	I agree to build a dam at EL.320 m because that elevation has a little impact.
25	Viengthong	Done	M	42	Head of village	Y	Y	Y	Y	Y	Y	Y	Y	I agree to build a dam at EL.320 m.
26	Dong	Phienthongcha	M	65	Elders Representative	Y	Y	Y	Y	Y	Y	Y	Y	I agree to build a dam at EL.320 m.
27	Viengthong	Phone	F	36	Lao Women Union	-	Y	Y	Y	Y	Y	Y	Y	I agree to build a dam at EL.320 m because that elevation has a little impact and local people do not need to resettle.
28	Phiangra	Singphone	M	32	Youth Organization	Y	Y	Y	Y	Y	Y	Y	Y	I agree to build a dam at EL.320 m because that elevation has a little impact.
29	Pou	Sitham	M	35	Youth Organization	Y	Y	Y	Y	Y	Y	Y	Y	I agree to build a dam at EL.320 m because that elevation has a little impact.
30	Naxay	Lor	F	56	Elders Representative	Y	Y	Y	Y	Y	Y	Y	Y	I agree to build a dam at EL.320 m.
31	Xiengkhone	Somlith Keokhamluang	M	38	Head of village	Y	Y	Y	Y	Y	Y	Y	Y	I agree to build a dam at EL.320 m.
32	Hatsamkhone	Xiengvanhsi	M	47	Elders Representative	Y	Y	Y	Y	Y	Y	Y	Y	-

SUPPORTING REPORT(V)

33	Phonhom	Bouathong	M	60	Elders	Y	Y	Y	Y	Y	Y	I agree to build a dam at EL.320 m.
34	Dong	Douang	M	48	Representative deputy head of village	Y	Y	Y	Y	Y	Y	I agree with the government to develop this area. For the Nam Ngiiep-1 HEPP, I request to build a dam at EL.320 m.
35	Dong	Chanthon	M	19	Youth Organisation	Y	Y	Y	Y	Y	Y	I agree to build a dam at EL.320 m.
36	Naxong	Vankham	F	35	Head of Women's Union	Y	Y	-	Y	Y	Y	I would like to ask you to build a dam at EL.320 m, because at this level has not big impact, and we do not like to move to other place. Thaviang is very rich area and comfortable for us to live here.
37	Nakang	Mai	F	50	Head of Women's Union	Y	Y	-	Y	Y	Y	I would like to ask you to build a dam at EL.320 m, because at this level has not big impact, and we do not like to move to other place.
38	Nahong	Bounta	F	35	Head of Women's Union	Y	Y	Y	Y	Y	-	I would like to ask you to build a dam at EL.320 m, because at this level has not big impact, and we do not like to move to other place. Thaviang is very much population and comfortable for us to live here.
39	Phonyeng	Phengsy	F	45	Head of Women's Union	Y	Y	-	Y	Y	Y	I would like to ask you to build a dam at EL.320 m, because at this level has not big impact, and we do not like to move to other place. Thaviang is very comfortable for us to live.
40	Naxay	Bounsouk Keopaset	M	34	Head of village	Y	Y	Y	Y	Y	Y	I agree with the Government to develop Nam Ngiiep-1 HEPP, but to avoid big environmental and social impact I suggest to build at EL.320 m, because I want to save Thaviang area.
41	Xiengkong	Lod	F	31	Deputy Head of Women's Union	-	-	-	-	-	-	G.I. I agree to build a dam at EL.320 m, because we do not like to move to other place.
42	Dong	Amphon	F	25	Head of Women's Union	Y	Y	Y	Y	Y	Y	I agree to build a dam at EL.320 m, because at this level has small impact and we do not like to move to other place.
43	Naxay	Laiphon	F	20	Head of Women's Union	Y	Y	-	Y	Y	Y	I would like to ask you to build a dam at EL.320 m, because at this level has not big impact, and we do not like to move to other place. Thaviang is very comfortable for us to live.
44	Nakang	Bounnoy	M	46	Head of village	Y	Y	Y	Y	Y	Y	(1) I agree to develop Nam Ngiiep-1 HEPP. (2) I agree to build a dam at EL.320 m.
45	Phiengta	Khammon	M	42	Head of village	Y	Y	Y	Y	Y	Y	I agree with the Government to develop Nam Ngiiep-1 HEPP, but at EL.320 m, because it has small impact and no need big fund.
46	Phiengta	Thun	F	48	Head of Women's Union	Y	Y	Y	Y	Y	Y	I agree with the Government to develop Nam Ngiiep-1 HEPP, but at EL.320 m, because it has small impact and no need big fund.
47	Phiengta	Tieng	F	14	Women's Union	Y	Y	Y	Y	Y	Y	I hope if this project is built, it will be improve our living standard, and government will be reach. I agree to build a dam at level 320 m

SUPPORTING REPORT(V)

1st Site Workshop

48	Phientga	Phien	F	17	Women's Union	Y	Y	Y	Y	Y	Y	Y	Y	I hope if this project is build, it will be improve our living standard, and government will be reach. I agree to build a dam at EL.320 m
49	Phonyeng	Hou	M	22	Head of Youth Organization	Y	Y	Y	Y	Y	Y	Y	Y	As your presentation and discussion I agree to build a dam at EL.320 m.

Site Workshop at B.Sopyouak on March 17, 1999

No.	Village	Name	Sex	Age	Position	Question							Comments	
						1	2	3	4	5	6	7		
1	Hom District	Suartho	M	49	Deputy Governor	Y	Y	Y	Y	Y	Y	Y	Y	(1) The best way you should be provided documents and questionnaire to the participants a few days before workshop (2) The District is planning to rearrange this 4 villages and providing a new jobs such as plant coffee and licorice and move them to 2 resettlement areas: 1. Their ex-village B.Nong. 2. Tong Samtien (Pouving). Please consider it possible or not. I agree with the government and project company, if you will be done as your promise. I understand the meaning of this meetings.
2	Sop Youak	Hacheuxong	M	42	Head of Village	Y	Y	Y	Y	Y	Y	Y	Y	
3	Sopphouan	Chongyalo	M	65	Elders Representative	Y	Y	Y	Y	Y	Y	Y	Y	
4	Sop Youak	Saymoayang	M	44	Militia	N	Y	N	N	N	N	N	N	
5	Sop Youak	Sayongyang	M	56	Driver	Y	Y	Y	Y	Y	Y	Y	Y	I agree with the project.
6	Sop Youak	Hakongyang	M	40		Y	Y	Y	Y	Y	-	Y	Y	
7	Sop Youak	Vanheuyang	M	46	Militia	Y	Y	Y	Y	Y	Y	Y	Y	
8	Sop Youak	Siabiyang	M	37	Deputy Head of Village	Y	Y	Y	Y	Y	Y	N	Y	
9	Sop youak	Losing	F	26	Women's Union	Y	Y	Y	Y	Y	Y	Y	Y	I agree with the project.
10	Sop Youak	Bongha	M	36		Y	Y	Y	Y	Y	Y	Y	Y	
11	Sopphouan	Xongyang	M	21	Head of Village	Y	Y	Y	Y	Y	Y	Y	Y	
12	Sop youak	Kouyang	M	22		Y	Y	Y	Y	Y	N	N	Y	
13	Nam youak	Cheufonglolia ma	M	30	Militia	Y	Y	Y	Y	Y	Y	Y	Y	I agree with the Government. I think if Nam Ngiep-I HEPP is build then living standard of people in this area will be improved.
14	Nam youak	Noayenglo	M	41	Elders Representative	Y	Y	Y	Y	Y	Y	Y	Y	
15	Sop youak	Bianengsong	M	40	Villager	Y	Y	Y	Y	Y	Y	Y	Y	
16	Sop youak	Nengha	M	31		Y	Y	Y	Y	Y	Y	Y	Y	
17	Houaypam om	Gniasavang	M	25	Youth Organization	Y	Y	Y	Y	Y	Y	Y	Y	
18	Soop youak	Thaivang	M	30	Deputy Head of Village	Y	Y	Y	Y	Y	Y	Y	Y	

SUPPORTING REPORT(V)

1st Site Workshop

19	Houaypam om	Thailo	M	20	Militia	Y	Y	Y	Y	Y	Y	Y	-
20	Houaypam om	Tongyangvang	M	56	Elders Representative	-	-	-	-	-	-	-	-
21	Sop youak	Chamtouasam	M	37	Elders Representative	-	-	-	-	-	-	-	-
22	Houaypam om	Gniayengvang	M	30	Head of Village	Y	Y	Y	Y	Y	Y	Y	I agree to develop hydropower and agriculture as mentioning.
23	Sop youak	Gnialoxong	M	55		Y	Y	Y	Y	N	N	Y	(1) If you find resettlement area better than our village, you can build the Dam and compensate every thing. (2) In this area almost Hmong people, so you should bring Hmong translator
24	Nam youak	Kousang	M	40	Head of Village	Y	Y	Y	Y	Y	Y	Y	-

Notes:

No.	Question	No.	Question
1.	Do you consider the Workshop well organized ?	5.	Did you receive an adequate response or explanation ?
2.	Was the Project well explained ?	6.	Do you now feel that you understand the Project better than before ?
3.	Did you find the discussion useful ?	7.	Do you think the Workshop has served its purpose ?
4.	Did you make any comments or ask questions during the sessions ?		Answer: (Y) Yes. (N) No. (-) No answer

4. SITE WORKSHOP

4.2 2ND SITE WORKSHOP

4.2.1 PROGRAM AND ATTENDANCE LIST

Nam Ngiep-I Hydroelectric Power Project

GENERAL SUMMARY
OF
2ND SITE WORKSHOP

(at B.Somseum on June 24, 1999)

(i) Date and Place

Date	Name of Village	Place	Representative
Jun.24	B.Somseum in Bolikhan District (D/S of Dam)	Public building	Main village in 14

Note : The village name of B.Moungmai was changed by B.Somseum.

(ii) Time Schedule of Workshop including Preparatory Work

No.	Date	Events	Remarks
1.	Jun.21 (Mon)	VTE→PKX by Car for Preparatory team of HPO	Stay at PKX
2.	Jun.22 (Tue)	PKX→B.Somseum→PKX by Car	Stay at PKX
3.	Jun.23 (Wed)	PKX→B.Somseum→PKX, VTE→PKX by Car	Stay at PKX
4.	Jun.24 (Thu)	PKX→B.Somseum→PKX by Car (Workshop)→VTE	Stay at PKX

Note; VTE:Vientiane, PKX:Pakxan, HTK:B.Hatkham

(iii) Participants

From Lao Government in Vientiane (Total 7 pers.)

No.	Name	Position	Car Arrangement
1.	Mr. Somboune	Deputy Director, HPO	S/Team-4
2.	Mr. Voradeth	HPO	S/Team-3
3.	Mr. Saynavat	STENO	S/Team-3
4.	Mr. Chansaveng	Counterpart, HPO	S/Team-2
5.	Mr. Semkhan	Counterpart, HPO	S/Team-3
6.	Mr. Khamman	Counterpart, HPO	S/Team-2
7.	Mr. Vithon	Counterpart, HPO	S/Team-2

From JICA, Study Team & Others in Vientiane (Total 10 pers.)

No.	Name	Position	Car Arrangement
1.	Mr. Sophonh K.	Programme Officer, JICA/Laos Office	JICA
2.	Ms. C.Shimado	Assistant Programme Officer, JICA/Laos Office	JICA
3.	Ms. K.Iwata	JICA Expert at Pakxan Hospital (JOCV)	JICA
4.	Mr. I.Araki	Team Leader, Study Team	S/Team-1
5.	Mr. B.Yon	Natural Environmental Expert, Study Team	S/Team-1
6.	Mr. T.Ragsdale	Social Environmental Expert, Study Team	S/Team-1
7.	Mr. Detmahinh	Interpreter (Laotian)	S/Team-3
8.	Mr. Khantam	Engineer of STS Consultants (Natural issues)	STS Consultants
9.	Mr. Singthong	Engineer of STS Consultants (Social issues)	STS Consultants
10.	Ms. Kesone	Gender Expert (Observer)	JICA

From Local Government (Total 1 per.)

No.	Name	Position
Bolikhambxay Province : 0		
1.	None	-
2.		
Bolikhamb District : 0		
1.	None	-
2.		
Pakxan District : 1		
1.	Mr.Khamphet	General Director of Cabinet
2.		

From Local Villages (Total 42 pers.)

No.	Name	Position
Villagers of Bolikhan District : 18 pers.		
1.	B.Hatkham	4 pers.
2.	B.Tahua	2 pers.
3.	B.Somseum (B.Moungmai)	5 pers.
4.	B.Houaykoun(inc.B.Nongdeng)	4 pers.
5.	B.Nampa	3 pers.
Villagers of Pakxan District : 24 pers.		
1.	B.Songkhon	3 pers.
2.	B.Thongnoi	4 pers.
3.	B.Thongnai	3 pers.
4.	B.Komsipchet	0 per. (Military village)
5.	B.Thakokkhen	2 pers.
6.	B.Phonsi	2 pers.
7.	B.Namngiep	4 pers.
8.	B.Namtek	2 pers.
9.	B.Senoudom	4 pers.

(iv) Program

No.	From	To	Agenda	Contents	Presenter/Staff
1.	08:00	08:30	Trip from Pakxan	-	6 cars
2.	08:30	09:00	Preparation	Panel Setting	HPO Staff
3.	09:00	09:30	Registration	Questionnaires/Note/Pen	HPO Staff
4.	09:30	-	Introduction of Participants	-	S/Team, Mr.Araki
5.	-	09:35	Introduction of JICA	JICA's policy and JICA Study	S/Team, Mr.Araki
6.	09:35	09:40	Project Description	Background of Project	S/Team, Mr.Araki
7.	09:40	09:50	Opening Speech	Power policy in Lao	HPO, Mr.Somboune
8.	09:50	10:20	Presentation (1)	Natural Impacts Issues	S/Team, Mr.Yon
9.	10:20	10:50	Discussion (1)	-	-
10.	10:50	11:10	Break Time		
11.	11:10	11:15	Explanation	Answer to Questionnaire	
12.	11:15	11:40	Presentation (2)	Social Impacts Issues	S/Team, Mr.Ragsdale
13.	11:40	11:55	Discussion (2)	-	-
14.	11:55	12:10	Supplementary Explanation	Nam Ngiep HEPP	HPO, Mr.Somboune
15.	12:10	12:20	Closing Speech	Thanks for participants	Local Governor
16.	12:20	13:00	Break Time	Lunch Preparation	-
17.	13:00	14:00	Lunch Time		
18.	14:00	17:00	Trip to VTE via Pakxan		

4. SITE WORKSHOP

4.2 2ND SITE WORKSHOP

4.2.2 MINUTES OF MEETING

**MINUTES OF MEETING
FOR
THE 2ND SITE WORKSHOP
FOR
INTERIM REPORT**

(At B.Somseuan, Bolikhhan District, June 24, 1999)

No.	Name and Position	Presentation / Questions and Comments	Explanation Items / Study Team's Comments
1.	Mr. I.Araiki, Team Leader of JICA S/Team	Introduction of Participants Introduction of JICA Introduction of the Project Introduction of JICA Study	<ol style="list-style-type: none"> 1. Presentation of HPO, STENO and Pakxane District Representative and JICA Study Team members 2. Introduction of JICA 3. Background on Project 4. Previous General Workshops in Vientiane and in Pakxane. 5. Previous Site workshop in B.Dong and B.Sopyouak 6. Next Site Workshop 7. Objective of the EIA Study in Nam Ngiep-I HEPP 8. Condition for the continuation of Nam Ngiep-I HEPP
2.	Mr. Somboun Manolom, Deputy Director of DoE, HPO/MIH	Opening Speech	<ol style="list-style-type: none"> 1. Thank you for your time and joining us 2. The GOL Policy toward rural electrification 3. The GOL Policy toward Energy Export as source for Foreign Income 4. The opportunity to boost rural development together with the implementation of hydropower projects.
3.	Dr. Bernard YON, Natural Environmentalist, JICA S/Team	Presentation of Natural Environmental Issues	<ol style="list-style-type: none"> 1. What is Hydropower Project? 2. Downstream villages will not be affected by resettlement issues 3. Water quality issues for water domestic use in the area below the Dam 4. Opportunity and easy access to water for agriculture irrigation purposes 5. Access road and jobs Opportunity during construction 6. Energy production regime 7. Water flow regime below the Dam 8. Fish issues. Fish pond as new reliable sources for domestic fishes consumption or sale.
4.	Break Time		

No.	Name and Position	Presentation / Questions and Comments	Explanation Items / Study Team's Comments										
5. (1)	Discussion Mr. Bounkong, Chief of B.Somseun	<p>1. What are the negative impacts to the people living in the downstream area?</p> <p>2. What happen to the production areas locating in the areas below the proposed dam? Will there be enough water all the time, for agriculture purposes?</p> <p>3. After the completion of the Dam, the water to be released from the Reservoir will be of bad quality, consequently what can be the mitigation measures to be given to the people living below the Dam?</p>	<p>1. After what have been presented to you today, the main likely impacts will come from :</p> <p>a) Change of water flow regime.</p> <p>b) Water quality of the Reservoir water, and</p> <p>c) Construction of the access roads.</p> <p>2. In some places, river bank gardens may receive.</p> <p>3. One of the mitigation measure to remedy the situation can be provided by the Project is the provision of "water supply system". That can be implemented by the Project for the people, in the case where by that time the affected villages are not yet equipped with water supply facilities.</p>										
(2)	Mr. Sa. Villager, B.Sen-Oudom	<p>After the construction of the Dam, will the water released from the Reservoir harm the health of the people and the livestock living below the Dam?</p>	<p>During the first years of operation, the water released will be of low quality. However, as we mentioned earlier, to alleviate the impact, the Project will provide water supply system to the villages. The situation at B.Sen-Oudom, would not be hard, because it is located 50 km far from the Dam. By the time the water arrive to this village, natural re-oxygenation has completely happen during its course. We anticipate the flow speed of the water would not exceed some 0.5 m/s. Therefore, likewise, heavy particles almost have the time to settle down to the bottom of the river bed. Your village will receive less impact.</p>										
6.	Dr. Tod Ragsdale, Social Environmentalist, JICA S/Team	Presentation of Social Environmental Issues	<p>1. Upper reservoir zone: people, villages and landuse</p> <p>2. Lower reservoir zone: people, villages and landuse</p> <p>3. 2 alternatives of FSL to consider (FSL320 and FSL360) and the size of the Reservoir at each respective alternative</p> <p>4. Resettlement issues in the Upper and Lower Zone</p> <p>5. New Resettlement sites: actual studies and compensation Concept</p>										
7. (1)	Discussion Mr. Mon Chief of Father Land Front B.Thong Gnai	<p>1. I understand that the majority of the people will move before the process of the impoundment of the Reservoir can start. However, is it correct to understand that the people who do not move are the ones whose villages and rice fields are not affected by the Reservoir water?</p> <p>2. When the Project will start? About year 2010?</p>	<p>1. Yes, depending of the FSL options, villages not submerged by the Reservoir will remain in their former place. If some paddy fields will be under water, they will be replaced at the same value, in term of size and fertility.</p> <p>2. Actually, it is very difficult to guess. The Future of this Project is depending on the results of our EIA study. In December 1999, the Government of Lao PDR and Japan will have to consider the said results. However, roughly we think that if every things can advance smoothly, each of the steps will require about:</p> <table border="0" data-bbox="1069 582 1212 1097"> <tr> <td>1. Technical Feasibility study phase</td> <td>: 1.5 year</td> </tr> <tr> <td>2. Detail Design</td> <td>: 2.0 years</td> </tr> <tr> <td>3. Negotiation of the PPA</td> <td>: 1.0 year</td> </tr> <tr> <td>4. Construction</td> <td>: 5.0 years</td> </tr> <tr> <td>TOTAL</td> <td>: 9.5 years</td> </tr> </table> <p>Say at least not less than 10 years. We understand your worry, therefore, we will keep you update with the findings and the decision of both Governments, no matter if the Project will be proceed or not. Therefore, if we are assuming 10 years from now optimistically, that means about year 2010.</p>	1. Technical Feasibility study phase	: 1.5 year	2. Detail Design	: 2.0 years	3. Negotiation of the PPA	: 1.0 year	4. Construction	: 5.0 years	TOTAL	: 9.5 years
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No.	Name and Position	Presentation / Questions and Comments	Explanation Items / Study Team's Comments
8.	Mr. Somboun Manolom, Deputy Director of DoE, HPO/MIH	Supplementary Explanation	<ol style="list-style-type: none"> 1. This Project as well as other hydropower projects are constituted with many long steps. 2. EIA study is obligatory for Hydropower Projects. Socio-Economic Studies gives us at least information on the present status of the livelihood of the population in the area. 3. The results of this EIA study will be considered by the Government of Japan and the Government of Lao PDR. Both Governments will discuss on benefit and harm that this Project will derive. 4. If the Project can continue, the second phase will focus on the technical issues such as: topography, geology, design...etc. 5. FSL.320 will require resettlement of about 1,200 people. 6. FSL.360 will require resettlement of about 5,300 people. 7. The JICA Study Team is to optimise the Study over FSLs between these 2 options. 8. Every body sustaining loss will be compensated. The resettled people must be better-off. Planning on sites for resettlement, jobs opportunities, income on household basis. 9. Inventories of the people assets will be done prior to the resettlement. 10. Public Consultation and Public Involvement are important. Bad experiences in the Nam Ngum-1 HEPP resettlement, there are no public consultation process. 11. Rural Development and Hydropower Power Project must be implemented together. 12. Project costs will be 700 and 500 million US\$ for FSL.360 and FSL.320, respectively. 13. The various steps at task that the Project must go through before the Construction can start. 14. Please do not sit and wait. You must continue to develop your village as before. 15. We will keep you inform with the findings of this Project. 16. Please, do not feel shy. Ask questions or make comments.
9.	Mr. Khamphet, Chief of Cabinet, Pakxan District	Closing Speech	<ol style="list-style-type: none"> 1. After your presentation, now the villagers have received better clarification on the Project features and issues. 2. Taking in account the importance of your study, all the people living in the area below of the Dam will be delighted to give assistance to you during the field works. 3. Once the Dam built, the livelihood of the people will be improved. 4. We thank you for the information that you did provide to us today. Please, come back to us in December 1999. We are very much interested with your latest findings. <p>Thank you, for your time. Thank you for participating.</p>
10.	Mr. I.Arahi, JICA Study Team, Team Leader	Closing Workshop	
11.	Lunch Time		