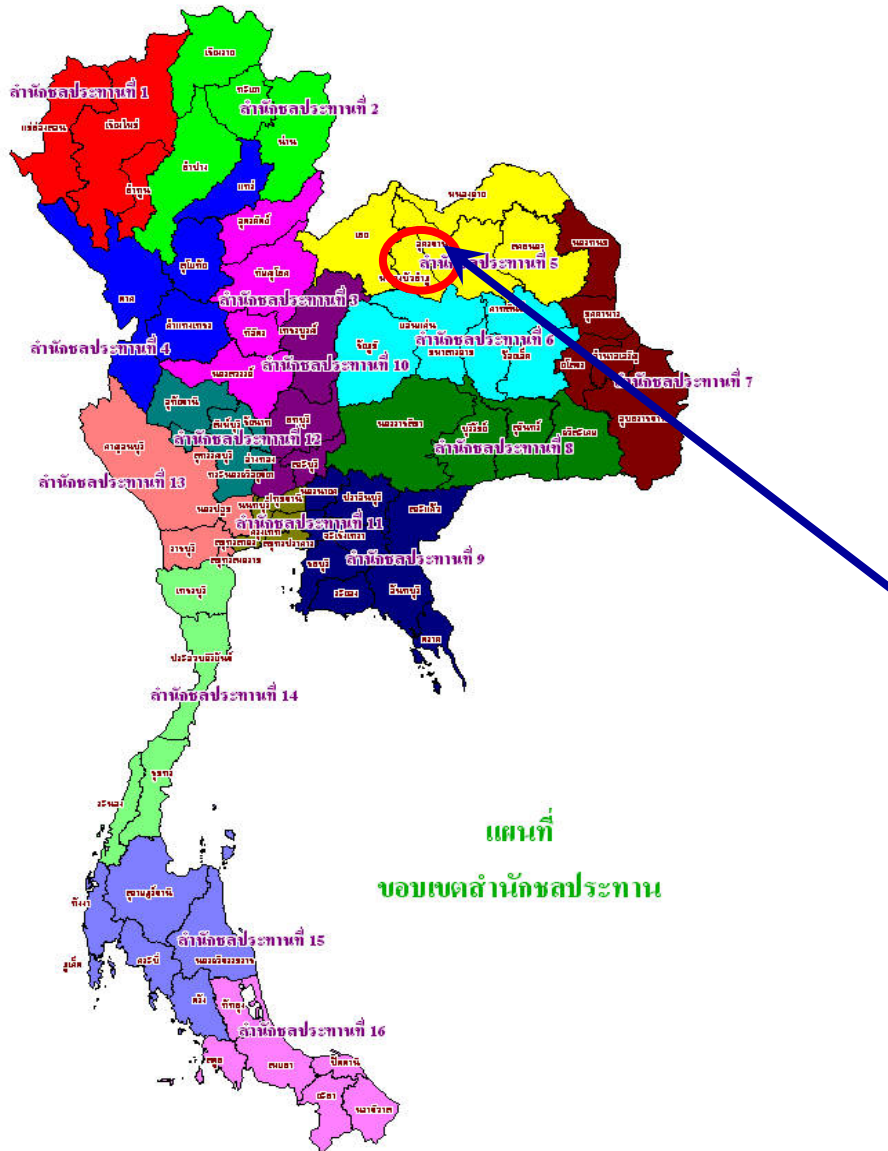


Thai Working Team Royal Irrigation Department (RID)

1. Mr.Chatchai Boonlue (RID HQ)
2. Mr.Somsak Vivithkeyoonvong (RID HQ)
3. Mr.Suwat Krajangmontre (Huay Luang O&M Proj.)
4. Mr. Pramote Pungpeun (Huay Luang O&M Proj.)
5. Mr. Sathit Sueprasrtsuk (DWR)



IIEPF

Huay Luang O&M Project
Udon Thani Province,
Thailand
Latitude : 17.3 N.
Longitude : 102 E.

Huay Luang Reservoir



Project feature

Headwork

Length 4.9 km., Width 6.00 m., Height 12.5 m.

Retention capacity 118.362 mcm.

Retention water surface area 32.00 sq.km.

- Avg. annual run-off 160.17 mcm.
- Avg. rainfall intensity 1,249.95 mm./yr.
- Evaporation 1,504.79 mm./yr.
- Avg. temperature 26.5 cc.
- Avg. humidity 71%

Spillway

3 Radial gates

Width 5.8 m., Height 6.0 m

Max. flow 710 cu.m./sec.



Huay Luang O&M Project covers irrigation area of 13,917.9 ha.

Qmax = 12.423 cms

Farmers 3,832 households

Qmax = 10.348 cms

Farmers 3,244 households



LMC area 7,912.16 ha.

Office of O&M Branch 3

RMC area 6,005.76 ha.

Office of O&M Branch 2

Schematic diagram

Left Main Canal Area

Off. of O&M 3

Right Main Canal Area

Off. of O&M 2

Watershed area 666 sq.km.

Off. of O&M 1

Organization chart of WUG

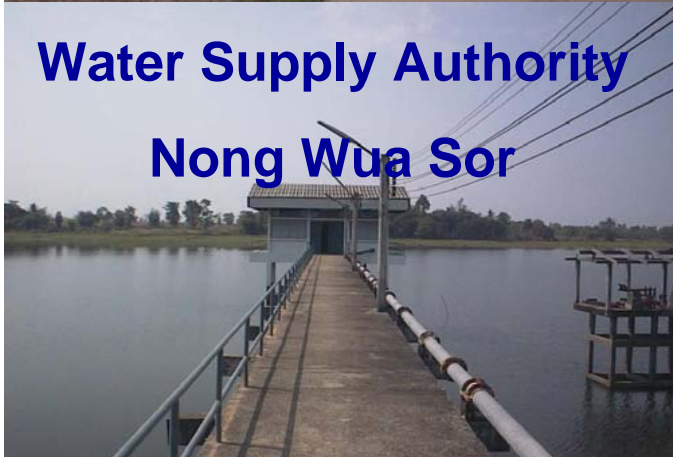
Water Supply Authority

Kud Jab District



Water Supply Authority

Nong Wua Sor



Water Supply Authority

Udon Thani



Water for domestic consumption

Unit : cu.m/year

1. Udon Thani Water Supply Authority	21,000,000
2. Kud Jab Water Supply Authority	540,000
3. Nong Wua Sor Water Supply Authority	540,000
4. Kok Sa-ard Water Supply Authority	50,400
5. Ban Nam Pon Water Supply Authority	504,000

Total 22,634,400

Water for industry (cu.m./year)

1.Thai Nam cassava flour plant	1,372,800
2.Udon Perm Pol cassava flour plant	2,790,000
Total	4,162,800



IIEPF activities conducted in the pilot schemes

Irrigation Efficiency

Flow measurement at 9 points in each canal level
(twice a week/point)

- LMC1 , LMC2 , LMC3 , LMC4
- 1R-L, 3R-L
- 1L-3R-L , 2L-3R-L , 3L-3R-L



IIEPF activities conducted in the pilot schemes

- Daily percolation measurement in paddy field of each zone
- Daily Water level measurement in fishpond of each zone

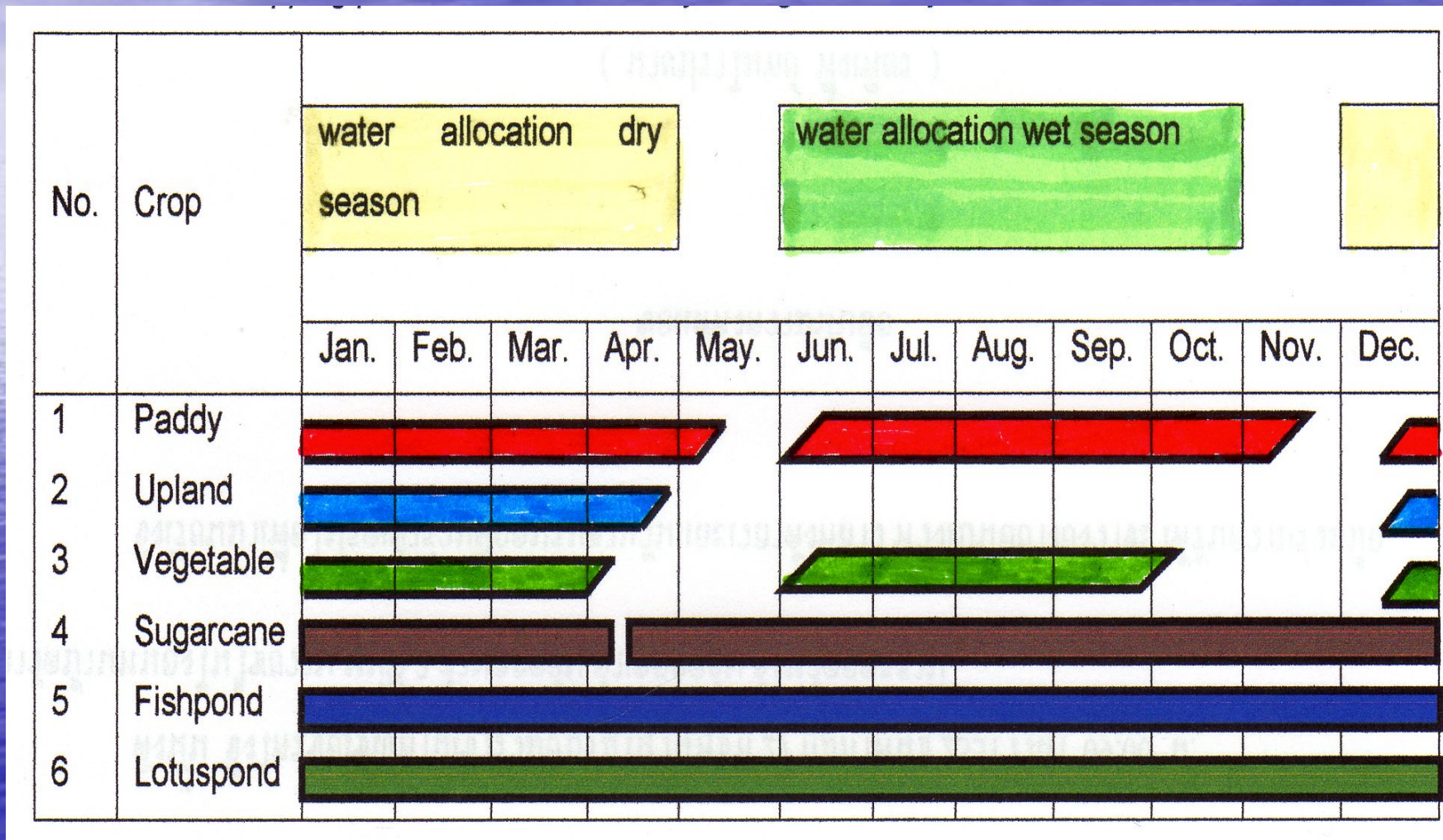


IIEPF activities conducted in the pilot schemes

- **Conveyance efficiency examination**
 - 1 Left main canal
 - 10 Lateral canals
 - 3 Sub-lateral canals
 - 6 Ditches
- **Calibration of 10 farm turnouts**



Cropping pattern calendar of Huay Luang O&M Project



M&E2

แบบรายงานการปลูกพืชและการเกษตรอื่นจริงและกิจกรรมกลุ่มผู้ใช้น้ำระดับตำบล/ทอ เมื่อสิ้นสุด

ฤดูฝน ปี 2549

ฝ่ายส่งน้ำและบำรุงรักษาที่ 3 โครงการส่งน้ำและบำรุงรักษาห้วยหลวง

กลุ่มฯ ท่อ/คูน้ำที่ 2R-4R-L 0+880 1R ได้ทำการปลูกพืชและการเกษตรอื่นจริงดังนี้

ชื่อสมาชิก	แปลงที่	ขนาดแปลงไร่	ชนิดพืชและพื้นที่ที่เพาะปลูกจริง (ไร่-งาน)				รวม
			ข้าวหน้า	ข้าวหน้าหวาน	บ่อปลา		
นางคำ คำผาย	1	9	8.75	-	0.25		9
นายสง่า ดาวสว่าง	2	5	5	-	-		5
นายบิน ชัยพันธ์	3	13	13	-	-		13
นายน้อย ทบบุญ	4	17	15.5	-	1.5		17
นายวิเชียร คานทอง	5	13	13	-	-		13
นางหนูเมือง สาพร	6	4	4	-	-		4
นางขัน วงทับซ้าย	7	7	7	-	-		7
นางออง ราชาศู	8	10	10	-	-		10
นายเนา สุวรรณสุข	9	22	22	-	-		22
นายคอง ค้างก้อน	10	20	20	-	-		20
นายบัลลังค์ จรศรีชัย	11	18	18	-	-		18
นายแหลมทอง ยงอิน	12	12	12	-	-		12
นายสัมฤทธิ์ อ่อนแสง	13	15	15	-	-		15
นายเจษฎา พันธุ์	14	8	8	-	-		8
นางทุมมา ยามากักดี	15	8	8	-	-		8
นายชาน เคนวงศ์	16	7	7	-	-		7
			185.75	-	2.25		188

ผู้สำรวจข้อมูล

(นาย...
7/100)

- Actual crop cultivation survey form (M&E 2)

Crop cultivation area in dry season 2006/2007

2,988 ha. (paddy 1,878 ha.)

Crop cultivation area in rainy season 2007

7,396 ha. (paddy 7,007 ha.)

Farmers' participatory irrigation water management

Official form showing water availability information for farmers and their crop growing intentions. The form includes columns for farmer name, area, and crop type.

Water allocation plan table approved by JMC. The table lists various parameters such as area, water allocation, and crop types for multiple farmers.

1. Official inform available water to farmers and farmers inform crop growing intention

2. Water allocation plan, approved by JMC



3. Ditch & sub-lateral canal cleaning by WUG before water distribution

4. Meeting of head of ditch for water rotation

Analysis results and major findings

Percolation (mm.) in paddy field

	Dry season 2006/2007	Wet season 2007	Average
Zone 1	1.906	2.330	2.118
Zone 2	1.418	2.136	1.777
Zone 3	2.539	2.745	2.642
Zone 4	2.923	2.795	2.859
Branch 3	2.197	2.502	2.349

Analysis results and major findings

ET_o – Modified Penman (mm./day)

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
3.75	4.59	5.56	6.03	5.19	4.59	4.53	4.20	4.41	4.53	4.04	3.61

Crop coefficient (K_c)

Week	Transplanting paddy	Broadcast paddy	Upland crop	Vegetable	Orchard	Fishpond
1	0.90	0	0.53	0.67	0.60	1.00
2	0.94	0.90	0.53	0.67	0.60	1.00
3	0.98	0.94	0.30	0.67	0.60	1.00
4	1.13	0.98	0.30	0.67	0.60	1.00
5	1.21	1.13	0.70	0.67	0.60	1.00
6	1.27	1.21	0.70	0.67	0.60	1.00
7	1.32	1.27	0.90	0.67	0.60	1.00
8	1.30	1.32	1.20	0.67	0.60	1.00
9	1.26	1.30	1.00	0.67	0.60	1.00
10	1.21	1.26	1.00	0.67	0.60	1.00
11	1.11	1.21	0.70	0.67	0.60	1.00
12	0.85	1.11	0.50	0.67	0.60	1.00
13	0.75	0.85		0.67	0.60	1.00
14		0.75		0.67	0.60	1.00

Analysis results and major findings

Dry season 2006/2007

Water Requirement of each plant (cu.m.)

Land Preparatio.	Nursing stage	Transplanting paddy	Broadcast paddy	Upland crop	Vegetable	Orchard	Fishpond
5,235,390	0	6,850	10,000,395	2,180,539	275,659	30,907	1,386,717
Area (ha)		6	1,875.96	722.52	68.48	9.2	235.32

Water Requirement of each plant (cu.m.)

Sugar	Lotus	grass	percolation	Total	Water Supplied	Rainfall (mm.)	Effective rainfall (cu.m.)
93,331	19,452	325,801	5,629,130	25,184,169	38,214,129	28.25	685,389
15.96	3.2	51.84		2,987.84			

Analysis results and major findings

Wet season 2007

Water Requirement of each plant (cu.m.)

Land preparation	Nursing stage	Transplanting paddy	Broadcast paddy	Upland crop	Vegetable	Orchard	Fishpond
14,014,480	434,156	29,389,280	1,112,820	17,152	7,167	92,407	1,411,954
Area (ha.)		6,751.5	255.7	1.8	1.9	27.3	265.4

Water Requirement of each plant (cu.m.)

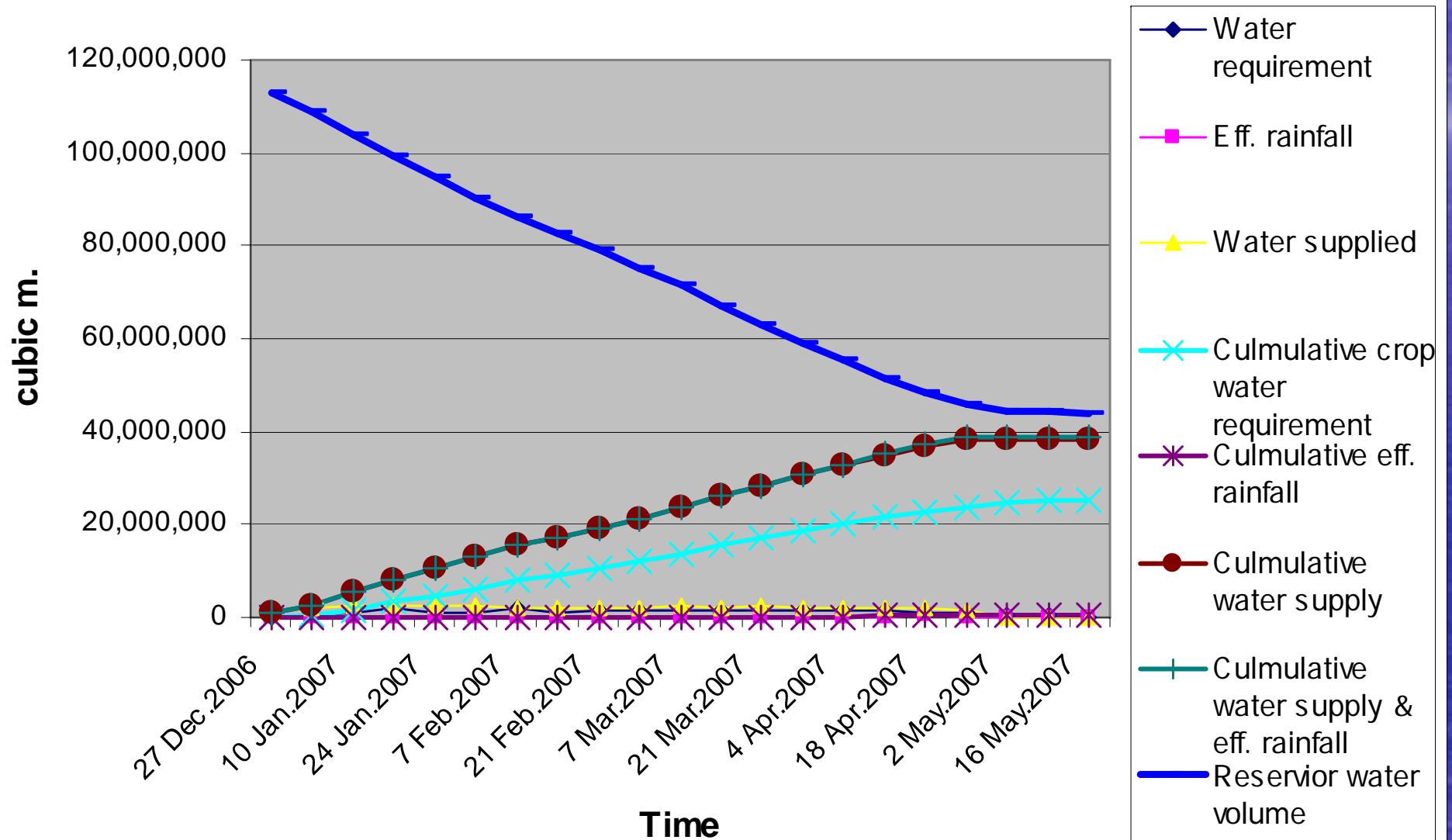
Sugar	Lotus	grass	percolation	Total	Water Supplied	Rainfall (mm.)	Effective rainfall (cubic meter)
91,055	14,887	236,094	17,441,345	64,262,797	26,097,553	873	50,956,035
15.9	2.7	52.3		7,395.6			

Analysis results and major findings

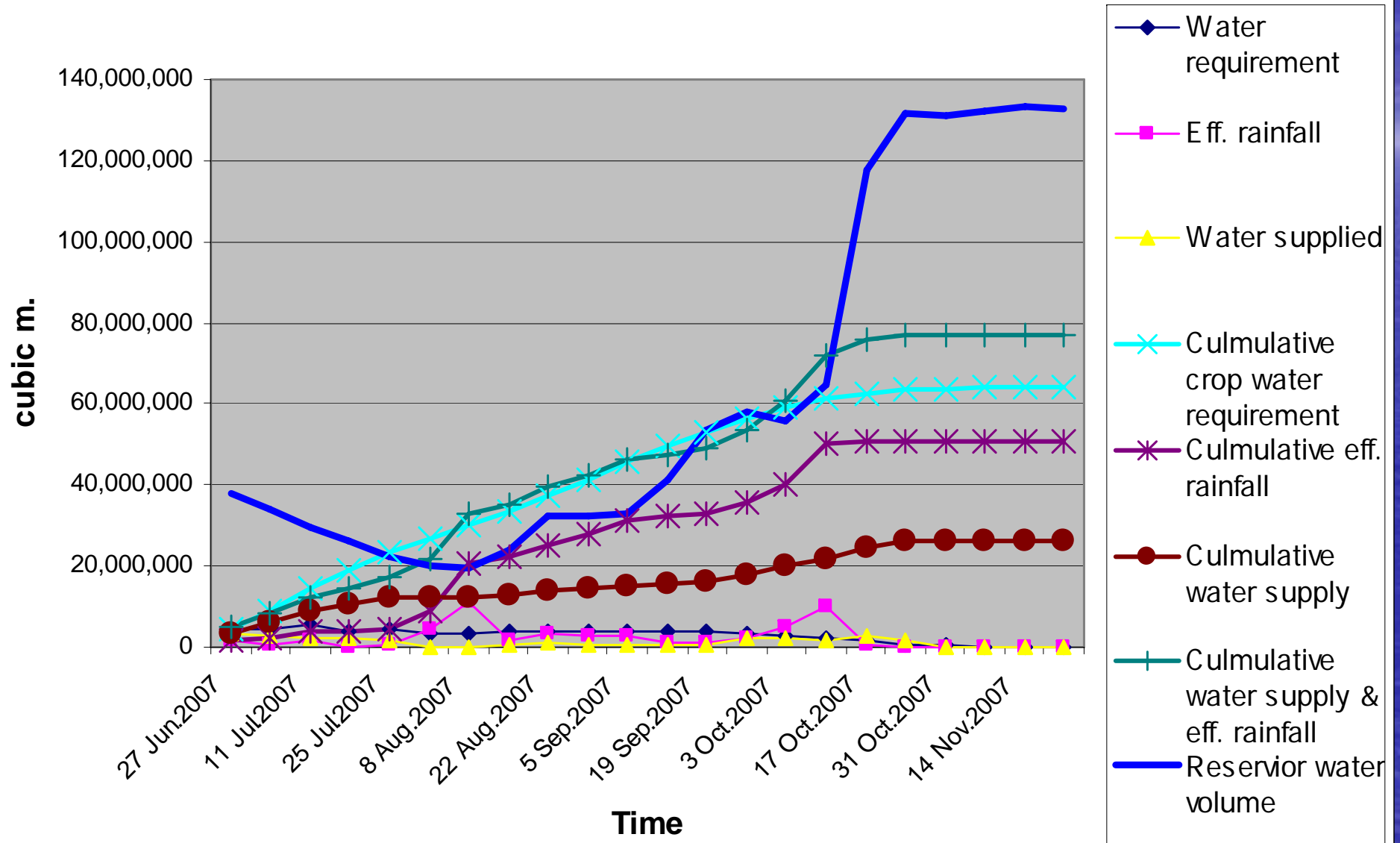
Conveyance efficiency

Canal	Responsible area (ha.)	Conveyance efficiency (%)
Left main canal	2,919	92.86
Lateral canal	3,450	89.99
Sub-lateral canal	2,263	88.17
Ditch		82.73
Left main canal water distribution	7,912	68.93

Water distribution in dry season 2006/2007



Water distribution in wet season 2007



Conclusion

	Dry season 2006/07	Wet season 2007	Unit
Total scheme water requirement	25,184,169	64,262,797	cu.m
Water delivered to users	38,214,129	26,097,553	cu.m
Effective rainfall	685,389	50,956,035	cu.m
Water delivered per cultivated area	12,789.2	3,528.6	cu.m/ ha.
Irrigation efficiency	64.11	50.99	%
Field efficiency	93.01	73.97	%
Income from crop productivity	113,940,338	251,273,525	Baht
Investment cost (machinery , seed, fertilizer, insecticide , labor)	53,417,978	106,614,650	Baht
Net income from agriculture	60,522,360	144,658,876	Baht
Crop productivity per irrigated water	2.98	9.63	Baht/c

Conclusion & Recommendation

- 1. Water allocation mostly meet the water requirement except during the shortage of rainfall period in wet season.
- 2. Water productivity is based on irrigation water supply only.
- 3. IIEPF should continue to cover another area of the Huay Luang O&M Proj. in order to evaluate overall system.
- 4. IIEPF result is very useful for decision making for better improvement of the irrigation water management.
- 5. To sustain efficient irrigation water management, not only human resource skill but also necessary equipments. Working team strongly recommend MRC to provide some equipments so that IIEPF could be sustainable development.
- 6. IIEPF is not only give the financial and technical supports but also chance for officials and WUG to improve and develop knowledge and experience. It is recommended training or seminar the officials are very important and MRC should provide some opportunities.



Thank you for your attention