

2. ESTIMATED PRODUCTION RATIO WITH IMPROVEMENT PLAN



Case O

Estimated Production Ratio with Present Condition

Code Canal C9	Name of Canal		Total Command Area (ha)			
	Bajo		142.91			
Return Period	Summer Crop			Winter Crop		
	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2		89%	77%	13%	100%	0%
1/5		88%	75%	13%	100%	0%
1/10		88%	75%	13%	100%	0%
1/20		87%	74%	13%	100%	0%
1/5 (Exceedance)		92%	79%	12%	100%	0%
1/10 (Exceedance)		93%	81%	12%	100%	0%
1/20 (Exceedance)		95%	82%	13%	100%	0%
Total		90%	77%	13%	100%	0%

Estimated Production Ratio with Present Condition

Code Canal C10	Name of Canal		Total Command Area (ha)			
	Phangyul		90.81			
Return Period	Summer Crop			Winter Crop		
	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2		47%	38%	9%	51%	24%
1/5		46%	37%	9%	49%	24%
1/10		45%	37%	9%	49%	23%
1/20		45%	36%	8%	48%	23%
1/5 (Exceedance)		47%	38%	9%	53%	26%
1/10 (Exceedance)		48%	39%	9%	54%	28%
1/20 (Exceedance)		48%	39%	10%	55%	30%
Total		47%	38%	9%	51%	25%

Estimated Production Ratio with Improvement of Water Management

Code	Name of Canal	Total Command Area (ha)				
Canal C9	Bajo	142.91				
Return	Summer Crop		Winter Crop			
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2		89%	87%	2%	100%	0%
1/5		88%	85%	3%	100%	0%
1/10		88%	85%	3%	100%	0%
1/20		87%	84%	3%	100%	0%
1/5 (Exceedance)		92%	89%	2%	100%	0%
1/10 (Exceedance)		93%	91%	2%	100%	0%
1/20 (Exceedance)		95%	92%	3%	100%	0%
Total		90%	87%	3%	100%	0%

Estimated Production Ratio with Improvement of Water Management

Code	Name of Canal	Total Command Area (ha)					
Canal C10	Phangyut	90.81					
Return	Summer Crop		Winter Crop				
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss	
1/2		47%	42%	4%	75%	71%	4%
1/5		46%	41%	4%	73%	69%	4%
1/10		45%	41%	4%	72%	68%	4%
1/20		45%	41%	4%	71%	68%	4%
1/5 (Exceedance)		47%	43%	4%	79%	74%	5%
1/10 (Exceedance)		48%	44%	4%	82%	77%	5%
1/20 (Exceedance)		48%	44%	4%	85%	80%	5%
Total		47%	42%	4%	76%	71%	4%

Estimated Production Ratio with Improvement of Canal

Code	Name of Canal	Total Command Area (ha)				
Canal C9	Bajo	142.91				
Return	Summer Crop		Winter Crop			
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	100%	87%	13%	100%	100%	0%
1/5	100%	86%	14%	100%	100%	0%
1/10	100%	85%	15%	100%	100%	0%
1/20	100%	85%	15%	100%	100%	0%
1/5 (Exceedance)	100%	89%	11%	100%	100%	0%
1/10 (Exceedance)	100%	89%	11%	100%	100%	0%
1/20 (Exceedance)	100%	90%	10%	100%	100%	0%
Total	100%	87%	13%	100%	100%	0%

Estimated Production Ratio with Improvement of Canal

Code		Name of Canal		Total Command Area (ha)		
Canal C10		Phangyul		90.81		
Return		Summer Crop			Winter Crop	
Period		Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss
					Management Loss	
1/2		61%	50%	10%	99%	76%
1/5		60%	49%	11%	98%	75%
1/10		60%	49%	11%	98%	74%
1/20		60%	49%	11%	98%	74%
1/5 (Exceedance)		62%	52%	10%	100%	78%
1/10 (Exceedance)		63%	52%	11%	100%	80%
1/20 (Exceedance)		63%	52%	11%	100%	81%
Total		61%	51%	10%	99%	76%

Estimated Production Ratio with Improvement of Water Management & Canal Improvement

Code	Name of Canal	Total Command Area (ha)				
Canal C9	Bajo	142.91				
Return	Summer Crop		Winter Crop			
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	100%	97%	3%	100%	100%	0%
1/5	100%	96%	4%	100%	100%	0%
1/10	100%	96%	4%	100%	100%	0%
1/20	100%	96%	4%	100%	100%	0%
1/5 (Exceedance)	100%	98%	2%	100%	100%	0%
1/10 (Exceedance)	100%	99%	1%	100%	100%	0%
1/20 (Exceedance)	100%	99%	1%	100%	100%	0%
Total	100%	97%	3%	100%	100%	0%

Estimated Production Ratio with Improvement of Water Management & Canal Improvement

Code	Name of Canal	Total Command Area (ha)				
Canal C10	Phangvul	90.81				
Return	Summer Crop		Winter Crop			
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	61%	57%	3%	99%	98%	1%
1/5	60%	57%	3%	98%	97%	1%
1/10	60%	56%	3%	98%	97%	1%
1/20	60%	56%	3%	98%	97%	1%
1/5 (Exceedance)	62%	58%	4%	100%	98%	1%
1/10 (Exceedance)	63%	59%	4%	100%	99%	1%
1/20 (Exceedance)	63%	60%	4%	100%	99%	1%
Total	61%	57%	3%	99%	98%	1%

Case C

Estimated Production Ratio with Improvement of Water Resources

Code		Name of Canal		Total Command Area (ha)	
Canal C9		Bajo		142.91	
Return		Summer Crop			Winter Crop
Period		Without Management Loss	With Management Loss	Management Loss	Without Management Loss
1/2		89%	77%	13%	100%
1/5		88%	75%	13%	100%
1/10		88%	75%	13%	100%
1/20		87%	74%	13%	100%
1/5 (Exceedance)		92%	79%	12%	100%
1/10 (Exceedance)		93%	81%	12%	100%
1/20 (Exceedance)		95%	82%	13%	100%
Total		90%	77%	13%	100%

Estimated Production Ratio with Improvement of Water Resources

Code		Name of Canal		Total Command Area (ha)	
Canal C10		Phangyul		90.81	
Return		Summer Crop			Winter Crop
Period		Without Management Loss	With Management Loss	Management Loss	Without Management Loss
1/2		57%	46%	11%	69%
1/5		56%	45%	11%	68%
1/10		56%	45%	11%	67%
1/20		56%	44%	11%	67%
1/5 (Exceedance)		58%	47%	10%	71%
1/10 (Exceedance)		58%	48%	11%	73%
1/20 (Exceedance)		59%	48%	11%	74%
Total		57%	46%	11%	69%

Estimated Production Ratio with Improvement of Water Management & Water Resources

Code	Name of Canal	Total Command Area (ha)					
Canal C9	Bajo	142.91					
Return	Summer Crop			Winter Crop			
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss	
1/2	89%	87%	2%	100%	100%	0%	
1/5	88%	85%	3%	100%	100%	0%	
1/10	88%	85%	3%	100%	100%	0%	
1/20	87%	84%	3%	100%	100%	0%	
1/5 (Exceedance)	92%	89%	2%	100%	100%	0%	
1/10 (Exceedance)	93%	91%	2%	100%	100%	0%	
1/20 (Exceedance)	95%	92%	3%	100%	100%	0%	
Total	90%	87%	3%	100%	100%	0%	

Estimated Production Ratio with Improvement of Water Management & Water Resources

Code	Name of Canal	Total Command Area (ha)				
Canal C(10	Phangvul	90.81				
Return	Summer Crop			Winter Crop		
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	57%	53%	3%	96%	95%	1%
1/5	56%	53%	4%	96%	95%	1%
1/10	56%	52%	4%	96%	94%	1%
1/20	56%	52%	4%	96%	94%	2%
1/5 (Exceedance)	58%	54%	3%	97%	96%	1%
1/10 (Exceedance)	58%	55%	3%	97%	96%	1%
1/20 (Exceedance)	59%	56%	3%	98%	97%	1%
Total	57%	53%	3%	96%	95%	1%

Estimated Production Ratio with Improvement of Water Resources & Canal

Estimated Production Ratio with Improvement of Water Resources						
Code	Name of Canal	Total Command Area (ha)				
Canal C9	Bajo	142.91				
Return	Summer Crop			Winter Crop		
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	100%	87%	13%	100%	100%	0%
1/5	100%	86%	14%	100%	100%	0%
1/10	100%	85%	15%	100%	100%	0%
1/20	100%	85%	15%	100%	100%	0%
1/5 (Exceedance)	100%	89%	11%	100%	100%	0%
1/10 (Exceedance)	100%	89%	11%	100%	100%	0%
1/20 (Exceedance)	100%	90%	10%	100%	100%	0%
Total	100%	87%	13%	100%	100%	0%

Estimated Production Ratio with Improvement of Water Resources & Canal

Code	Name of Canal	Total Command Area (ha)				
Canal C10	Phangyul	90.81				
Return	Summer Crop		Winter Crop			
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	77%	59%	18%	100%	94%	6%
1/5	75%	57%	18%	100%	93%	7%
1/10	75%	57%	18%	100%	93%	7%
1/20	75%	56%	18%	100%	93%	7%
1/5 (Exceedance)	78%	60%	18%	100%	96%	4%
1/10 (Exceedance)	79%	61%	19%	100%	96%	4%
1/20 (Exceedance)	80%	61%	19%	100%	97%	3%
Total	77%	59%	18%	100%	95%	5%

Estimated Production Ratio with Improvement of Water Management, Canal & Water Resources

Code	Name of Canal	Total Command Area (ha)				
Canal C9	Bajo	142.91				
Return	Summer Crop			Winter Crop		
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	100%	97%	3%	100%	100%	0%
1/5	100%	96%	4%	100%	100%	0%
1/10	100%	96%	4%	100%	100%	0%
1/20	100%	96%	4%	100%	100%	0%
1/5 (Exceedance)	100%	98%	2%	100%	100%	0%
1/10 (Exceedance)	100%	99%	1%	100%	100%	0%
1/20 (Exceedance)	100%	99%	1%	100%	100%	0%
Total	100%	97%	3%	100%	100%	0%

Estimated Production Ratio with Improvement of Water Management, Canal & Water Resources

Code	Name of Canal	Total Command Area (ha)				
Canal C10	Phangvul	90.81				
Return	Summer Crop		Winter Crop			
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	77%	72%	5%	100%	100%	0%
1/5	75%	71%	5%	100%	100%	0%
1/10	75%	70%	5%	100%	100%	0%
1/20	75%	70%	5%	100%	100%	0%
1/5 (Exceedance)	78%	73%	5%	100%	100%	0%
1/10 (Exceedance)	79%	74%	5%	100%	100%	0%
1/20 (Exceedance)	80%	75%	5%	100%	100%	0%
Total	77%	72%	5%	100%	100%	0%

Case D-1

Estimated Production Ratio with 5% Diversification

Code	Name of Canal	Total Command Area (ha)				
Canal C9	Bajo	142.91				
Return			Summer Crop		Winter Crop	
Period			Without Management Loss	With Management Loss	Without Management Loss	With Management Loss
1/2			92%	79%	100%	100%
1/5			90%	77%	100%	100%
1/10			90%	76%	100%	100%
1/20			89%	76%	100%	100%
1/5 (Exceedance)			94%	81%	100%	100%
1/10 (Exceedance)			96%	83%	100%	100%
1/20 (Exceedance)			97%	84%	100%	100%
Total			92%	79%	100%	100%

Estimated Production Ratio with 5% Diversification

Code	Name of Canal	Total Command Area (ha)				
Canal C10	Phangyut	90.81				
Return			Summer Crop		Winter Crop	
Period			Without Management Loss	With Management Loss	Without Management Loss	With Management Loss
1/2			47%	38%	75%	51%
1/5			47%	38%	73%	49%
1/10			46%	37%	72%	49%
1/20			46%	37%	71%	48%
1/5 (Exceedance)			48%	39%	79%	53%
1/10 (Exceedance)			49%	40%	82%	54%
1/20 (Exceedance)			49%	40%	85%	55%
Total			48%	39%	76%	51%

Estimated Production Ratio with Improvement of Water Management & 5% Diversification

Code	Name of Canal	Total Command Area (ha)				
Canal C9	Bajo	142.91				
Return	Summer Crop		Winter Crop			
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2		92%	89%	3%	100%	0%
1/5		90%	88%	2%	100%	0%
1/10		90%	87%	2%	100%	0%
1/20		89%	87%	3%	100%	0%
1/5 (Exceedance)		94%	92%	3%	100%	0%
1/10 (Exceedance)		96%	93%	3%	100%	0%
1/20 (Exceedance)		97%	94%	3%	100%	0%
Total		92%	90%	3%	100%	0%

Estimated Production Ratio with Improvement of Water Management & 5% Diversification

Code	Name of Canal	Total Command Area (ha)					
Canal C10	Phangyul	90.81					
Return	Summer Crop		Winter Crop				
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss	
1/2		47%	43%	4%	75%	71%	4%
1/5		47%	42%	4%	73%	69%	4%
1/10		46%	42%	4%	72%	68%	4%
1/20		46%	41%	4%	71%	68%	3%
1/5 (Exceedance)		48%	45%	4%	79%	75%	4%
1/10 (Exceedance)		49%	45%	4%	82%	77%	5%
1/20 (Exceedance)		49%	45%	4%	85%	80%	5%
Total		48%	43%	4%	76%	72%	4%

Case BD-1

Estimated Production Ratio with Improvement of Canal & 5% Diversification

Name of Canal Total Command Area (ha)						
Canal C9		Bajo		142.91		
Return	Summer Crop			Winter Crop		
	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
Period						
1/2	100%	88%	12%	100%	100%	0%
1/5	100%	87%	13%	100%	100%	0%
1/10	100%	87%	13%	100%	100%	0%
1/20	100%	86%	14%	100%	100%	0%
1/5 (Exceedance)	100%	90%	10%	100%	100%	0%
1/10 (Exceedance)	100%	91%	9%	100%	100%	0%
1/20 (Exceedance)	100%	92%	8%	100%	100%	0%
Total	100%	89%	11%	100%	100%	0%

Estimated Production Ratio with Improvement of Canal & 5% Diversification

Code	Name of Canal	Total Command Area (ha)					
Canal C10	Phangyul	90.81					
Return	Summer Crop			Winter Crop			
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss	
1/2		62%	52%	10%	99%	77%	23%
1/5		61%	51%	11%	99%	75%	24%
1/10		61%	50%	11%	98%	75%	24%
1/20		61%	50%	11%	98%	74%	24%
1/5 (Exceedance)		63%	53%	10%	100%	79%	21%
1/10 (Exceedance)		64%	53%	11%	100%	80%	20%
1/20 (Exceedance)		65%	54%	11%	100%	82%	18%
Total		62%	52%	10%	99%	77%	22%

Estimated Production Ratio with Improvement of Water Management, Canal & 5% Diversification

Code	Name of Canal	Total Command Area (ha)				
Canal C9	Bajo	142.91				
Return	Summer Crop		Winter Crop			
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	100%	98%	2%	100%	100%	0%
1/5	100%	98%	2%	100%	100%	0%
1/10	100%	98%	2%	100%	100%	0%
1/20	100%	97%	3%	100%	100%	0%
1/5 (Exceedance)	100%	99%	1%	100%	100%	0%
1/10 (Exceedance)	100%	99%	1%	100%	100%	0%
1/20 (Exceedance)	100%	100%	0%	100%	100%	0%
Total	100%	99%	1%	100%	100%	0%

Estimated Production Ratio with Improvement of Water Management, Canal & 5% Diversification

Name of Canal Total Command Area (ha)						
Code	Phangyut		90.81			
Canal C10						
Return	Summer Crop			Winter Crop		
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	62%	59%	4%	99%	98%	1%
1/5	61%	58%	4%	99%	98%	1%
1/10	61%	57%	4%	98%	97%	1%
1/20	61%	57%	3%	98%	97%	1%
1/5 (Exceedance)	63%	60%	4%	100%	99%	1%
1/10 (Exceedance)	64%	61%	4%	100%	99%	1%
1/20 (Exceedance)	65%	61%	4%	100%	99%	1%
Total	62%	59%	4%	99%	98%	1%

Case D-2

Estimated Production Ratio wit 10% Diversification

Code	Name of Canal Command Area (ha)					
Canal C9	Bajo		142.91			
Return	Summer Crop			Winter Crop		
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	94%	81%	14%	100%	100%	0%
1/5	93%	79%	14%	100%	100%	0%
1/10	92%	78%	14%	100%	100%	0%
1/20	92%	78%	14%	100%	100%	0%
1/5 (Exceedance)	97%	83%	13%	100%	100%	0%
1/10 (Exceedance)	99%	85%	14%	100%	100%	0%
1/20 (Exceedance)	100%	86%	14%	100%	100%	0%
Total	95%	81%	14%	100%	100%	0%

Estimated Production Ratio wit 10% Diversification

Code	Name of Canal		Command Area (ha)			
Canal C10	Phangyul		90.81			
Return	Summer Crop			Winter Crop		
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	48%	39%	9%	75%	51%	24%
1/5	48%	39%	9%	73%	49%	23%
1/10	47%	38%	9%	72%	49%	23%
1/20	47%	38%	9%	71%	48%	23%
1/5 (Exceedance)	49%	40%	9%	79%	53%	26%
1/10 (Exceedance)	50%	41%	9%	82%	55%	27%
1/20 (Exceedance)	50%	41%	10%	85%	56%	29%
Total	49%	39%	9%	76%	51%	24%

Estimated Production Ratio with Improvement of Water Management & 10% Diversification

Code	Name of Canal	Total Command Area (ha)				
Canal C9	Bajo	142.91				
Return	Summer Crop			Winter Crop		
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	94%	91%	3%	100%	100%	0%
1/5	93%	90%	3%	100%	100%	0%
1/10	92%	89%	3%	100%	100%	0%
1/20	92%	89%	3%	100%	100%	0%
1/5 (Exceedance)	97%	94%	3%	100%	100%	0%
1/10 (Exceedance)	99%	95%	4%	100%	100%	0%
1/20 (Exceedance)	100%	96%	4%	100%	100%	0%
Total	95%	92%	3%	100%	100%	0%

Estimated Production Ratio with Improvement of Water Management & 10% Diversification

Code	Name of Canal	Total Command Area (ha)				
Canal C10	Phangul	90.81				
Return	Summer Crop			Winter Crop		
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	48%	45%	4%	75%	71%	4%
1/5	48%	43%	4%	73%	69%	3%
1/10	47%	43%	4%	72%	69%	3%
1/20	47%	43%	4%	71%	68%	3%
1/5 (Exceedance)	49%	46%	4%	79%	75%	4%
1/10 (Exceedance)	50%	46%	4%	82%	77%	5%
1/20 (Exceedance)	50%	47%	4%	85%	80%	5%
Total	49%	45%	4%	76%	72%	4%

Case BD-2

Estimated Production Ratio with Improvement of Canal & 10% Diversification

Name of Canal Total Command Area (ha)						
Canal C9		Bajo		142.91		
Return	Summer Crop			Winter Crop		
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	100%	90%	10%	100%	100%	0%
1/5	100%	89%	11%	100%	100%	0%
1/10	100%	88%	12%	100%	100%	0%
1/20	100%	88%	12%	100%	100%	0%
1/5 (Exceedance)	100%	91%	9%	100%	100%	0%
1/10 (Exceedance)	100%	92%	8%	100%	100%	0%
1/20 (Exceedance)	100%	94%	6%	100%	100%	0%
Total	100%	90%	10%	100%	100%	0%

Estimated Production Ratio with Improvement of Canal & 10% Diversification

Code		Name of Canal	Total Command Area (ha)			
Canal C10		Phangvul	90.81			
Return		Summer Crop			Winter Crop	
Period		Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss
1/2		64%	53%	11%	100%	77%
1/5		63%	52%	11%	99%	75%
1/10		62%	51%	11%	99%	75%
1/20		62%	51%	11%	99%	74%
1/5 (Exceedance)		65%	54%	11%	100%	79%
1/10 (Exceedance)		66%	55%	11%	100%	80%
1/20 (Exceedance)		67%	55%	12%	100%	82%
Total		64%	53%	11%	100%	77%

Estimated Production Ratio with Improvement of Canal, Water Management & 10% Diversification

Code		Name of Canal		Total Command Area (ha)	
Canal C9		Bajo		142.91	
Return		Summer Crop			Winter Crop
Period		Without Management Loss	With Management Loss	Management Loss	Without Management Loss
1/2		100%	99%	1%	100%
1/5		100%	99%	1%	100%
1/10		100%	99%	1%	100%
1/20		100%	99%	1%	100%
1/5 (Exceedance)		100%	100%	0%	100%
1/10 (Exceedance)		100%	100%	0%	100%
1/20 (Exceedance)		100%	100%	0%	100%
Total		100%	99%	1%	100%

Estimated Production Ratio with Improvement of Canal, Water Management & 10% Diversification

Code		Name of Canal		Total Command Area (ha)	
Canal C10		Phangyul		90.81	
Return		Summer Crop			Winter Crop
Period		Without Management Loss	With Management Loss	Management Loss	Without Management Loss
1/2		64%	60%	4%	98%
1/5		63%	59%	4%	98%
1/10		62%	59%	4%	98%
1/20		62%	58%	4%	98%
1/5 (Exceedance)		65%	61%	4%	99%
1/10 (Exceedance)		66%	62%	4%	99%
1/20 (Exceedance)		67%	63%	4%	99%
Total		64%	60%	4%	98%

Estimated Production Ratio with 15% Diversification

Code	Name of Canal	Total Command Area (ha)				
Canal C9	Bajo	142.91				
Return	Summer Crop			Winter Crop		
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	97%	83%	14%	100%	100%	0%
1/5	95%	81%	15%	100%	100%	0%
1/10	95%	80%	15%	100%	100%	0%
1/20	94%	80%	15%	100%	100%	0%
1/5 (Exceedance)	100%	86%	14%	100%	100%	0%
1/10 (Exceedance)	100%	87%	13%	100%	100%	0%
1/20 (Exceedance)	100%	88%	12%	100%	100%	0%
Total	97%	83%	14%	100%	100%	0%

Estimated Production Ratio with 15% Diversification

Code	Name of Canal	Total Command Area (ha)				
Canal C10	Phangyul	90.81				
Return	Summer Crop			Winter Crop		
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	50%	40%	9%	75%	51%	24%
1/5	49%	39%	9%	73%	49%	23%
1/10	48%	39%	9%	72%	49%	23%
1/20	48%	39%	9%	71%	48%	23%
1/5 (Exceedance)	51%	41%	9%	79%	53%	26%
1/10 (Exceedance)	51%	42%	10%	82%	55%	27%
1/20 (Exceedance)	52%	42%	10%	85%	56%	28%
Total	50%	40%	9%	76%	51%	24%

Estimated Production Ratio with Improvement of Water Management & 15% Diversification

Code	Name of Canal	Total Command Area (ha)				
Canal C9	Bajo	142.91				
Return	Summer Crop		Winter Crop			
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2		97%	93%	3%	100%	0%
1/5		95%	92%	3%	100%	0%
1/10		95%	92%	3%	100%	0%
1/20		94%	91%	3%	100%	0%
1/5 (Exceedance)		100%	96%	4%	100%	0%
1/10 (Exceedance)		100%	97%	3%	100%	0%
1/20 (Exceedance)		100%	98%	2%	100%	0%
Total		97%	94%	3%	100%	0%

Estimated Production Ratio with Improvement of Water Management & 15% Diversification

Code	Name of Canal	Total Command Area (ha)					
Canal C10	Phangyul	90.81					
Return	Summer Crop		Winter Crop				
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss	
1/2		50%	46%	4%	75%	71%	4%
1/5		49%	45%	4%	73%	69%	3%
1/10		48%	44%	4%	72%	69%	3%
1/20		48%	44%	4%	71%	68%	3%
1/5 (Exceedance)		51%	47%	4%	79%	75%	4%
1/10 (Exceedance)		51%	48%	4%	82%	77%	5%
1/20 (Exceedance)		52%	48%	4%	85%	80%	5%
Total		50%	46%	4%	76%	72%	4%

Case BD-3

Estimated Production Ratio with Improvement of Canal & 15% Diversification

Estimated & Assumed Values						
Code	Name of Canal	Total Command Area (ha)				
Canal C9	Bajo	142.91				
Return	Summer Crop			Winter Crop		
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	100%		87%	13%	100%	0%
1/5	100%		86%	14%	100%	0%
1/10	100%		85%	15%	100%	0%
1/20	100%		84%	16%	100%	0%
1/5 (Exceedance)	100%		89%	11%	100%	0%
1/10 (Exceedance)	100%		90%	10%	100%	0%
1/20 (Exceedance)	100%		91%	9%	100%	0%
Total	100%		87%	13%	100%	0%

Estimated Production Ratio with Improvement of Canal & 15% Diversification

Estimate of Production under Various Management Practices						
Code	Name of Canal	Total Command Area (ha)				
Canal C10	Phangvul	90.81				
Return	Summer Crop			Winter Crop		
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	65%	53%	12%	100%	77%	23%
1/5	64%	52%	13%	99%	76%	24%
1/10	64%	51%	13%	99%	75%	24%
1/20	63%	50%	13%	99%	75%	24%
1/5 (Exceedance)	67%	54%	13%	100%	79%	21%
1/10 (Exceedance)	68%	55%	13%	100%	80%	20%
1/20 (Exceedance)	69%	55%	14%	100%	82%	18%
Total	65%	53%	13%	100%	77%	23%

Estimated Production Ratio with Improvement of Water Management, Canal & 15% Diversification

Estimated Production Ratio with Improvement of Water Management						
Code	Name of Canal	Total Command Area (ha)				
Canal C9	Bajo	142.91				
Return	Summer Crop			Winter Crop		
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	100%	98%	2%	100%	100%	0%
1/5	100%	97%	3%	100%	100%	0%
1/10	100%	96%	4%	100%	100%	0%
1/20	100%	96%	4%	100%	100%	0%
1/5 (Exceedance)	100%	99%	1%	100%	100%	0%
1/10 (Exceedance)	100%	99%	1%	100%	100%	0%
1/20 (Exceedance)	100%	100%	0%	100%	100%	0%
Total	100%	98%	2%	100%	100%	0%

Estimated Production Ratio with Improvement of Water Management, Canal & 15% Diversification

Estimated Production Ratio with Improvement of Water Management						
Code	Name of Canal		Total Command Area (ha)			
Canal C10	Phangyul		90.81			
Return	Summer Crop			Winter Crop		
Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	65%	61%	4%	100%	99%	1%
1/5	64%	60%	4%	99%	98%	1%
1/10	64%	60%	4%	99%	98%	1%
1/20	63%	60%	4%	99%	98%	1%
1/5 (Exceedance)	67%	63%	4%	100%	99%	1%
1/10 (Exceedance)	68%	64%	4%	100%	99%	1%
1/20 (Exceedance)	69%	65%	4%	100%	100%	0%
Total	65%	62%	4%	100%	99%	1%

Estimated Production Ratio with 20% Diversification

ESTIMATED PRODUCTION VALUE WITH 20% EXCEEDANCE						
Code	Name of Canal	Total Command Area (ha)				
Canal C9	Bajo	142.91	Summer Crop		Winter Crop	
Return Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	99%	85%	15%	100%	100%	0%
1/5	98%	83%	15%	100%	100%	0%
1/10	97%	82%	15%	100%	100%	0%
1/20	97%	81%	15%	100%	100%	0%
1/5 (Exceedance)	100%	88%	12%	100%	100%	0%
1/10 (Exceedance)	100%	89%	11%	100%	100%	0%
1/20 (Exceedance)	100%	90%	10%	100%	100%	0%
Total	99%	85%	14%	100%	100%	0%

Estimated Production Ratio with 20% Diversification

Estimated Production Ratio with 20% Exceedance							
Code	Name of Canal	Total Command Area (ha)	Summer Crop			Winter Crop	
Canal C10	Phangyui	90.81					
Return Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss	
1/2	51%	41%	9%	75%	51%	24%	
1/5	50%	40%	10%	73%	49%	23%	
1/10	50%	40%	10%	72%	49%	23%	
1/20	49%	40%	10%	71%	48%	23%	
1/5 (Exceedance)	52%	43%	9%	79%	53%	26%	
1/10 (Exceedance)	53%	43%	10%	82%	55%	27%	
1/20 (Exceedance)	53%	43%	10%	84%	56%	28%	
Total	51%	41%	9%	76%	51%	25%	

Estimated Production Ratio with Improvement of Water Management & 20% Diversification

Code	Name of Canal	Total Command Area (ha)			
Canal C9	Bajo	142.91			
Return Period	Summer Crop			Winter Crop	
	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss
1/2		99%	96%	4%	100%
1/5		98%	94%	4%	100%
1/10		97%	94%	4%	100%
1/20		97%	93%	4%	100%
1/5 (Exceedance)		100%	98%	2%	100%
1/10 (Exceedance)		100%	99%	1%	100%
1/20 (Exceedance)		100%	99%	1%	100%
Total		99%	96%	3%	100%

Estimated Production Ratio with Improvement of Water Management & 20% Diversification

Code	Name of Canal	Total Command Area (ha)			
Canal C10	Phangyul	90.81			
Return Period	Summer Crop			Winter Crop	
	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss
1/2		51%	47%	4%	75%
1/5		50%	46%	4%	73%
1/10		50%	45%	4%	72%
1/20		49%	45%	4%	71%
1/5 (Exceedance)		52%	48%	4%	79%
1/10 (Exceedance)		53%	49%	4%	82%
1/20 (Exceedance)		53%	50%	4%	84%
Total		51%	47%	4%	76%

Case BD-4

Estimated Production Ratio with Improvement of Canal & 20% Diversification

Name of Canal Total Command Area (ha)						
Code	Bajo		142.91			
Canal C9	Summer Crop			Winter Crop		
Return Period	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	100%	93%	7%	100%	100%	0%
1/5	100%	92%	8%	100%	100%	0%
1/10	100%	91%	9%	100%	100%	0%
1/20	100%	91%	9%	100%	100%	0%
1/5 (Exceedance)	100%	94%	6%	100%	100%	0%
1/10 (Exceedance)	100%	95%	5%	100%	100%	0%
1/20 (Exceedance)	100%	96%	4%	100%	100%	0%
Total	100%	93%	7%	100%	100%	0%

Estimated Production Ratio with Improvement of Canal & 20% Diversification

Code		Name of Canal		Total Command Area (ha)		
Canal C10		Phangyul		90.81		
Return Period	Summer Crop			Winter Crop		
	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss	Management Loss
1/2	67%		56%	11%	100%	77%
1/5	66%		55%	11%	100%	75%
1/10	65%		54%	11%	99%	75%
1/20	65%		53%	12%	99%	74%
1/5 (Exceedance)	69%		57%	12%	100%	79%
1/10 (Exceedance)	70%		58%	12%	100%	80%
1/20 (Exceedance)	71%		58%	13%	100%	82%
Total	67%		56%	11%	100%	77%

Estimated Production Ratio with Improvement of Water Management, Canal & 20% Diversification

Code		Name of Canal		Total Command Area (ha)	
Canal C9		Bajo		142.91	
Return Period	Summer Crop			Winter Crop	
	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss
1/2	100%	100%	0%	100%	100%
1/5	100%	100%	0%	100%	100%
1/10	100%	100%	0%	100%	100%
1/20	100%	100%	0%	100%	100%
1/5 (Exceedance)	100%	100%	0%	100%	100%
1/10 (Exceedance)	100%	100%	0%	100%	100%
1/20 (Exceedance)	100%	100%	0%	100%	100%
Total	100%	100%	0%	100%	100%

Estimated Production Ratio with Improvement of Water Management, Canal & 20% Diversification

Code		Name of Canal		Total Command Area (ha)	
Canal C10		Phangyul		90.81	
Return Period	Summer Crop			Winter Crop	
	Without Management Loss	With Management Loss	Management Loss	Without Management Loss	With Management Loss
1/2		67%	63%	4%	100%
1/5		66%	62%	4%	100%
1/10		65%	61%	4%	99%
1/20		65%	61%	4%	99%
1/5 (Exceedance)		69%	65%	4%	100%
1/10 (Exceedance)		70%	66%	4%	100%
1/20 (Exceedance)		71%	67%	4%	100%
Total		67%	63%	4%	100%

Case E-1

Code	Name of Canal	Total Command Area (ha)															
Canal C9	Bajo	142.91															
Return Period	Summer Crop		Winter Crop		First Paddy		Second Paddy		Winter Crop								
	Without	With	Without	With													
	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss
Case E-1 : Estimated Production Ratio with 20% Double Cropping																	
1/2	95%	82%	13%	100%	98%	92%	6%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/5	94%	80%	14%	100%	98%	91%	7%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/10	94%	80%	14%	100%	98%	91%	7%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/20	93%	79%	14%	100%	97%	90%	7%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/5 (Ex.)	98%	84%	13%	100%	99%	94%	6%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/10 (Ex.)	99%	86%	14%	100%	100%	94%	5%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/20 (Ex.)	100%	87%	13%	100%	100%	95%	5%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
Total	96%	82%	14%	100%	98%	92%	6%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
Case AE-1 : Estimated Production Ratio with Improvement of Water Management (20% Double Cropping)																	
1/2	95%	92%	3%	100%	97%	95%	2%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/5	94%	90%	4%	100%	96%	94%	2%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/10	93%	89%	4%	100%	96%	93%	3%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/20	93%	89%	4%	100%	95%	93%	2%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/5 (Ex.)	98%	94%	3%	100%	98%	96%	2%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/10 (Ex.)	99%	95%	4%	100%	99%	97%	2%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/20 (Ex.)	100%	97%	3%	100%	100%	98%	2%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
Total	96%	92%	4%	100%	97%	95%	2%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
Case BE-1 : Estimated Production Ratio with 20% Double Cropping & Canal Improvement																	
1/2	100%	87%	13%	100%	100%	94%	6%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/5	100%	85%	15%	100%	100%	94%	6%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/10	100%	85%	15%	100%	100%	93%	7%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/20	99%	85%	15%	100%	100%	93%	7%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/5 (Ex.)	100%	89%	11%	100%	100%	96%	4%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/10 (Ex.)	100%	90%	10%	100%	100%	96%	4%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/20 (Ex.)	100%	91%	9%	100%	100%	96%	4%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
Total	100%	87%	13%	100%	100%	95%	5%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
Case ABE-1 : Estimated Production Ratio with Improvement of Water Management (20% Double Cropping) & Canal Improvement																	
1/2	100%	97%	3%	100%	100%	98%	2%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/5	100%	96%	4%	100%	100%	98%	2%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/10	100%	95%	4%	100%	100%	97%	3%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/20	99%	95%	4%	100%	100%	97%	3%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/5 (Ex.)	100%	98%	2%	100%	100%	99%	1%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/10 (Ex.)	100%	99%	1%	100%	100%	99%	1%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
1/20 (Ex.)	100%	99%	1%	100%	100%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%
Total	100%	97%	3%	100%	100%	98%	2%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%

Code	Name of Canal	Total Command Area (ha)								
Canal C9	Bayo	142.91								
Return Period	Summer Crop		Winter Crop		First Paddy		Second Paddy		Winter Crop	
	Without	With	Without	With	Without	With	Without	With	Without	With
	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss
Case E-2 : Estimated Production Ratio with 40% Double Cropping										
1/2	100%	87%	13%	100%	0%	100%	95%	100%	0%	100%
1/5	100%	86%	14%	100%	0%	100%	94%	100%	0%	100%
1/10	100%	85%	15%	100%	0%	100%	93%	100%	0%	100%
1/20	99%	85%	15%	100%	0%	100%	93%	100%	0%	100%
1/5 (EX.)	100%	89%	11%	100%	0%	100%	96%	100%	0%	100%
1/10 (EX.)	100%	90%	10%	100%	0%	100%	96%	100%	0%	100%
1/20 (EX.)	100%	91%	9%	100%	0%	100%	97%	100%	0%	100%
Total	100%	87%	13%	100%	0%	100%	95%	100%	0%	100%
Case AE-2 : Estimated Production Ratio with Improvement of Water Management (40% Double Cropping)										
1/2	100%	97%	3%	100%	0%	100%	98%	100%	0%	100%
1/5	100%	96%	4%	100%	0%	100%	98%	100%	0%	100%
1/10	100%	96%	4%	100%	0%	100%	97%	100%	0%	100%
1/20	99%	95%	4%	100%	0%	99%	97%	100%	0%	100%
1/5 (EX.)	100%	99%	1%	100%	0%	100%	99%	100%	0%	100%
1/10 (EX.)	100%	99%	1%	100%	0%	100%	100%	100%	0%	100%
1/20 (EX.)	100%	99%	1%	100%	0%	100%	100%	100%	0%	100%
Total	100%	97%	3%	100%	0%	100%	98%	100%	0%	100%
Case BE-2 : Estimated Production Ratio with 40% Double Cropping & Canal Improvement										
1/2	100%	87%	13%	100%	0%	100%	95%	100%	0%	100%
1/5	100%	86%	14%	100%	0%	100%	94%	100%	0%	100%
1/10	100%	85%	15%	100%	0%	100%	93%	100%	0%	100%
1/20	99%	85%	15%	100%	0%	100%	93%	100%	0%	100%
1/5 (EX.)	100%	89%	11%	100%	0%	100%	96%	100%	0%	100%
1/10 (EX.)	100%	90%	10%	100%	0%	100%	96%	100%	0%	100%
1/20 (EX.)	100%	91%	9%	100%	0%	100%	97%	100%	0%	100%
Total	100%	87%	13%	100%	0%	100%	95%	100%	0%	100%
Case ABE-2 : Estimated Production Ratio with Improvement of Water Management (40% Double Cropping) & Canal Improvement										
1/2	100%	97%	3%	100%	0%	100%	98%	100%	0%	100%
1/5	100%	96%	4%	100%	0%	100%	98%	100%	0%	100%
1/10	100%	96%	4%	100%	0%	100%	97%	100%	0%	100%
1/20	99%	95%	4%	100%	0%	99%	97%	100%	0%	100%
1/5 (EX.)	100%	99%	1%	100%	0%	100%	99%	100%	0%	100%
1/10 (EX.)	100%	99%	1%	100%	0%	100%	100%	100%	0%	100%
1/20 (EX.)	100%	99%	1%	100%	0%	100%	100%	100%	0%	100%
Total	100%	97%	3%	100%	0%	100%	98%	100%	0%	100%

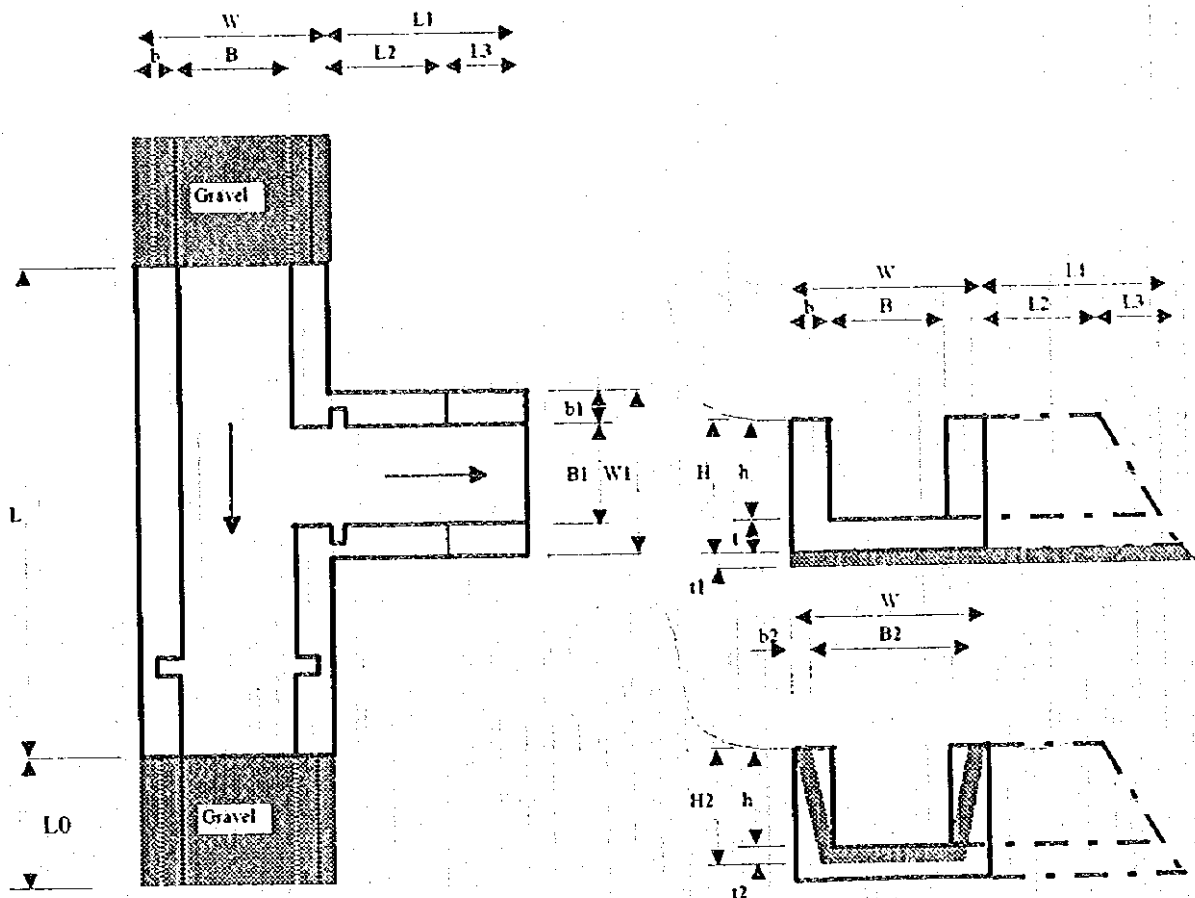
Case E-3

Code	Name of Canal	Total Command Area (ha)								
Canal C9	Bajo	142.91								
Return Period	Summer Crop		Winter Crop		First Paddy		Second Paddy		Winter Crop	
	Without	With	Without	With	Without	With	Without	With	Without	With
	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss	M.Loss
Case E-3 : Estimated Production Ratio with 60% Double Cropping										
1/2	100%	91%	9%	100%	98%	2%	100%	95%	5%	100%
1/5	100%	90%	10%	100%	98%	2%	100%	94%	6%	100%
1/10	100%	90%	10%	100%	98%	2%	100%	93%	7%	100%
1/20	100%	89%	11%	100%	98%	2%	100%	93%	7%	100%
1/5 (EX.)	100%	93%	7%	100%	99%	1%	100%	97%	3%	100%
1/10 (EX.)	100%	95%	5%	100%	99%	1%	100%	98%	2%	100%
1/20 (EX.)	100%	95%	5%	100%	99%	1%	100%	98%	2%	100%
Total	100%	92%	8%	100%	98%	2%	100%	95%	5%	100%
Case AE-3 : Estimated Production Ratio with Improvement of Water Management (60% Double Cropping)										
1/2	100%	100%	0%	100%	100%	0%	100%	100%	0%	100%
1/5	100%	99%	1%	100%	100%	0%	100%	100%	0%	100%
1/10	100%	99%	1%	100%	100%	0%	100%	100%	0%	100%
1/20	100%	99%	1%	100%	100%	0%	100%	100%	0%	100%
1/5 (EX.)	100%	100%	0%	100%	100%	0%	100%	100%	0%	100%
1/10 (EX.)	100%	100%	0%	100%	100%	0%	100%	100%	0%	100%
1/20 (EX.)	100%	100%	0%	100%	100%	0%	100%	100%	0%	100%
Total	100%	100%	0%	100%	100%	0%	100%	100%	0%	100%
Case BE-3 : Estimated Production Ratio with 60% Double Cropping & Canal Improvement										
1/2	100%	87%	13%	100%	95%	5%	100%	89%	11%	100%
1/5	100%	85%	15%	100%	95%	5%	100%	87%	13%	100%
1/10	100%	84%	16%	100%	95%	5%	100%	87%	13%	100%
1/20	99%	83%	16%	100%	95%	5%	100%	86%	13%	100%
1/5 (EX.)	100%	89%	11%	100%	96%	4%	100%	91%	9%	100%
1/10 (EX.)	100%	91%	9%	100%	97%	3%	100%	92%	8%	100%
1/20 (EX.)	100%	92%	8%	100%	97%	3%	100%	94%	6%	100%
Total	100%	87%	13%	100%	95%	5%	100%	89%	11%	100%
Case ABE-3 : Estimated Production Ratio with Improvement of Water Management (60% Double Cropping) & Canal Improvement										
1/2	100%	97%	3%	100%	100%	0%	100%	98%	2%	100%
1/5	100%	96%	4%	100%	100%	0%	100%	98%	2%	100%
1/10	100%	96%	4%	100%	100%	0%	100%	97%	3%	100%
1/20	99%	95%	4%	100%	100%	0%	100%	97%	3%	100%
1/5 (EX.)	100%	99%	1%	100%	100%	0%	100%	99%	1%	100%
1/10 (EX.)	100%	99%	1%	100%	100%	0%	100%	100%	0%	100%
1/20 (EX.)	100%	100%	0%	100%	100%	0%	100%	100%	0%	100%
Total	100%	97%	3%	100%	100%	0%	100%	98%	2%	100%

Code	Name of Canal	Total Command Area (ha)													
Canal C9	Bato	142.91													
Return Period	Summer Crop			Winter Crop			First Paddy			Second Paddy			Winter Crop		
	Without M.Loss	With M.Loss	M.Loss	Without M.Loss	With M.Loss	M.Loss	Without M.Loss	With M.Loss	M.Loss	Without M.Loss	With M.Loss	M.Loss	Without M.Loss	With M.Loss	M.Loss
Case E-4 : Estimated Production Ratio with 100% Double Cropping															
1/2	100%	98%	2%	100%	93%	7%	100%	91%	9%	100%	98%	2%	100%	100%	0%
1/5	100%	96%	4%	100%	92%	8%	100%	90%	10%	100%	98%	2%	100%	100%	0%
1/10	100%	96%	4%	100%	92%	8%	100%	90%	10%	100%	97%	3%	100%	100%	0%
1/20	100%	95%	5%	100%	92%	8%	100%	90%	10%	100%	97%	3%	100%	100%	0%
1/5 (Ex.)	100%	100%	0%	100%	94%	6%	100%	92%	8%	100%	100%	0%	100%	100%	0%
1/10 (Ex.)	100%	100%	0%	100%	94%	6%	100%	93%	7%	100%	100%	0%	100%	100%	0%
1/20 (Ex.)	100%	100%	0%	100%	94%	6%	100%	93%	7%	100%	100%	0%	100%	100%	0%
Total	100%	98%	2%	100%	93%	7%	100%	91%	9%	100%	99%	1%	100%	100%	0%
Case AE-4 : Estimated Production Ratio with Improvement of Water Management (100% Double Cropping)															
1/2	100%	100%	0%	100%	99%	1%	100%	98%	2%	100%	100%	0%	100%	100%	0%
1/5	100%	100%	0%	100%	99%	1%	100%	98%	2%	100%	100%	0%	100%	100%	0%
1/10	100%	100%	0%	100%	99%	1%	100%	98%	2%	100%	100%	0%	100%	100%	0%
1/20	100%	100%	0%	100%	99%	1%	100%	97%	3%	100%	100%	0%	100%	100%	0%
1/5 (Ex.)	100%	100%	0%	100%	99%	1%	100%	99%	1%	100%	100%	0%	100%	100%	0%
1/10 (Ex.)	100%	100%	0%	100%	100%	0%	100%	99%	1%	100%	100%	0%	100%	100%	0%
1/20 (Ex.)	100%	100%	0%	100%	100%	0%	100%	99%	1%	100%	100%	0%	100%	100%	0%
Total	100%	100%	0%	100%	99%	1%	100%	98%	2%	100%	100%	0%	100%	100%	0%
Case BE-4 : Estimated Production Ratio with 100% Double Cropping & Canal Improvement															
1/2	100%	97%	3%	100%	92%	8%	100%	90%	10%	100%	98%	2%	100%	100%	0%
1/5	100%	95%	5%	100%	92%	8%	100%	89%	11%	100%	97%	3%	100%	100%	0%
1/10	100%	95%	5%	100%	91%	9%	100%	89%	11%	100%	97%	3%	100%	100%	0%
1/20	100%	94%	6%	100%	91%	9%	100%	88%	12%	100%	97%	3%	100%	100%	0%
1/5 (Ex.)	100%	99%	1%	100%	93%	7%	100%	91%	9%	100%	99%	1%	100%	100%	0%
1/10 (Ex.)	100%	100%	0%	100%	93%	7%	100%	92%	8%	100%	100%	0%	100%	100%	0%
1/20 (Ex.)	100%	100%	0%	100%	94%	6%	100%	92%	8%	100%	100%	0%	100%	100%	0%
Total	100%	97%	3%	100%	92%	8%	100%	90%	10%	100%	98%	2%	100%	100%	0%
Case ABE-4 : Estimated Production Ratio with Improvement of Water Management (100% Double Cropping) & Canal Improvement															
1/2	100%	100%	0%	100%	99%	1%	100%	97%	3%	100%	100%	0%	100%	100%	0%
1/5	100%	100%	0%	100%	98%	2%	100%	97%	3%	100%	100%	0%	100%	100%	0%
1/10	100%	100%	0%	100%	98%	2%	100%	97%	3%	100%	100%	0%	100%	100%	0%
1/20	100%	100%	0%	100%	98%	2%	100%	96%	3%	100%	100%	0%	100%	100%	0%
1/5 (Ex.)	100%	100%	0%	100%	99%	1%	100%	98%	2%	100%	100%	0%	100%	100%	0%
1/10 (Ex.)	100%	100%	0%	100%	99%	1%	100%	99%	1%	100%	100%	0%	100%	100%	0%
1/20 (Ex.)	100%	100%	0%	100%	100%	0%	100%	99%	1%	100%	100%	0%	100%	100%	0%
Total	100%	100%	0%	100%	99%	1%	100%	97%	3%	100%	100%	0%	100%	100%	0%

3. PRELIMINARY DESIGN OF IRRIGATION FACILITIES

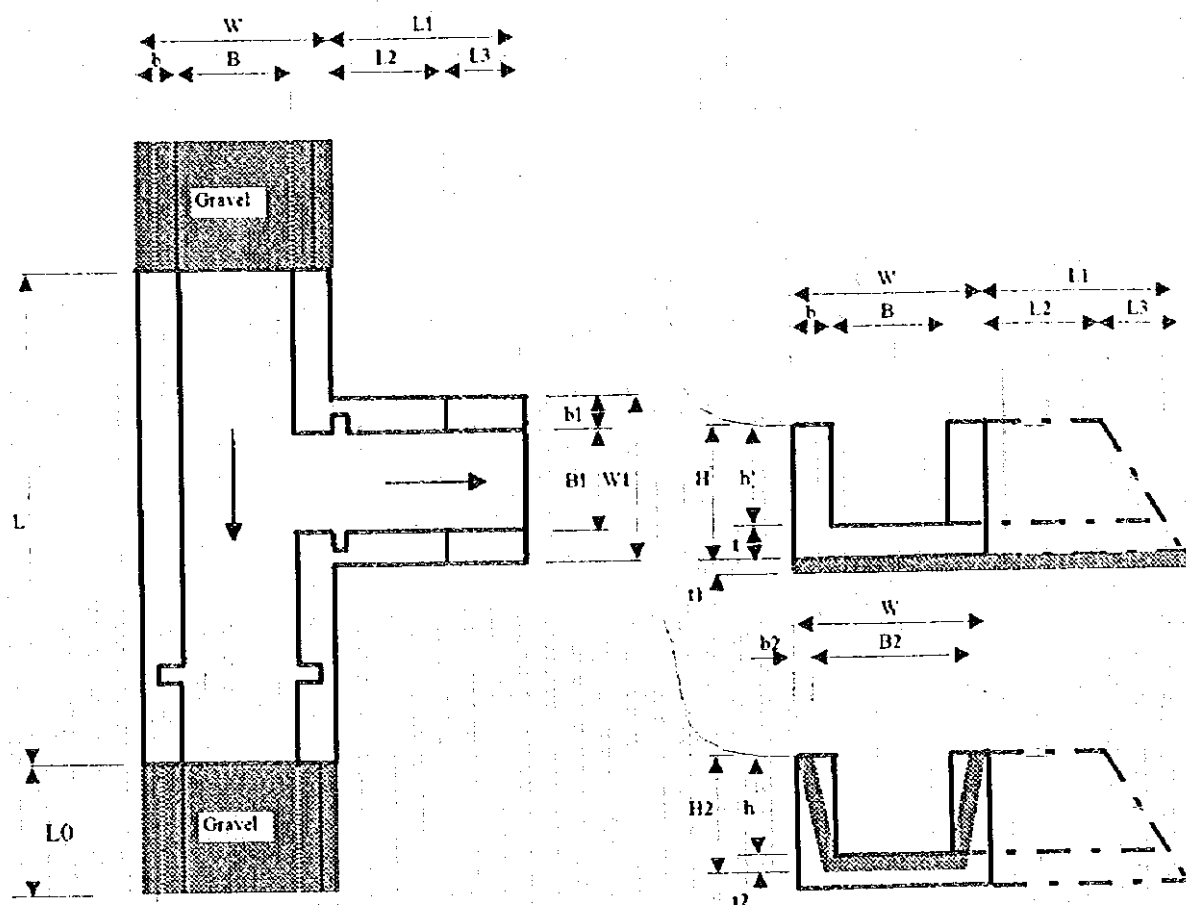
(1) Typical Structure of Offtake Works and Dimensions



Dimensions of Diversion Works (m)

Type O1	L	L0	L1	L2	L3	W	W1	B	B1	B2	Canal Capacity Q (m ³ /s)	Remark
	3.40	0.40	3.00	2.00	1.00	2.40	2.40	1.80	1.80	2.10	0.80 ~ 1.00	
	b	b1	b2	H	H2	h	t	t1	t2			
	0.30	0.30	0.15	1.50	1.35	1.20	0.30	0.30	0.15			
Type O2	L	L0	L1	L2	L3	W	W1	B	B1	B2	Canal Capacity Q (m ³ /s)	Remark
	3.10	0.40	3.00	2.00	1.00	2.10	2.10	1.50	1.50	1.80	0.50 ~ 0.80	
	b	b1	b2	H	H2	h	t	t1	t2			
	0.30	0.30	0.15	1.40	1.25	1.10	0.30	0.30	0.15			
Type O3	L	L0	L1	L2	L3	W	W1	B	B1	B2	Canal Capacity Q (m ³ /s)	Remark
	2.80	0.40	3.00	2.00	1.00	1.80	1.80	1.20	1.20	1.50	0.30 ~ 0.50	
	b	b1	b2	H	H2	h	t	t1	t2			
	0.30	0.30	0.15	1.20	1.05	0.90	0.30	0.30	0.15			
Type O4	L	L0	L1	L2	L3	W	W1	B	B1	B2	Canal Capacity Q (m ³ /s)	Remark
	2.60	0.40	3.00	2.00	1.00	1.60	1.60	1.00	1.00	1.30	0.20 ~ 0.30	
	b	b1	b2	H	H2	h	t	t1	t2			
	0.30	0.30	0.15	1.00	0.85	0.70	0.30	0.30	0.15			
Type O5	L	L0	L1	L2	L3	W	W1	B	B1	B2	Canal Capacity Q (m ³ /s)	Remark
	2.40	0.40	3.00	2.00	1.00	1.40	1.40	0.80	0.80	1.10	0.10 ~ 0.20	
	b	b1	b2	H	H2	h	t	t1	t2			
	0.30	0.30	0.15	0.90	0.75	0.60	0.30	0.30	0.15			

(1) Typical Structure of Offtake Works and Dimensions



Dimensions of Diversion Works (m)

Type O6	L	L0	L1	L2	L3	W	W1	B	B1	B2	Canal Capacity Q (m ³ /s)	Remark
	2.20	0.40	3.00	2.00	1.00	1.20	1.20	0.60	0.60	1.00	0.05 ~ 0.10	
	b	b1	b2	H	H2	h	t	t1	t2			
	0.30	0.30	0.10	0.80	0.60	0.50	0.30	0.30	0.10			
Type O7	L	L0	L1	L2	L3	W	W1	B	B1	B2	Canal Capacity Q (m ³ /s)	Remark
	1.90	0.40	3.00	2.00	1.00	0.90	0.90	0.50	0.50	0.70	0.03 ~ 0.05	
	b	b1	b2	H	H2	h	t	t1	t2			
	0.20	0.20	0.10	0.70	0.50	0.40	0.30	0.30	0.10			
Type O8	L	L0	L1	L2	L3	W	W1	B	B1	B2	Canal Capacity Q (m ³ /s)	Remark
	1.80	0.40	3.00	2.00	1.00	0.80	0.80	0.40	0.40	0.60	0.00 ~ 0.03	
	b	b1	b2	H	H2	h	t	t1	t2			
	0.20	0.20	0.10	0.60	0.40	0.30	0.30	0.30	0.10			

BQ of Offtake Works (1/4)

Offtake Works Type O1 Q=0.8 ~ 1.0 m3/s									
Dimensions									
L	L0	L1	L2	L3	W	W1	B	B1	B2
3.4	0.4	3.0	2.0	1.0	2.4	2.4	1.8	1.8	2.1
b	b1	b2	H	H2	h	t	t1	t2	
0.3	0.3	0.2	1.5	1.4	1.2	0.3	0.3	0.2	
Item	Unit	Quantity	Equations						
Excavation	m ³	14.688	$W \cdot L \cdot (H - t1)$						
	m ³	-7.344	$-B \cdot L \cdot h$						
	m ³	10.800	$W1 \cdot (L2 - L3/2) \cdot (H - t1)$						
	m ³	0.378	$(B \cdot t2 - b2 \cdot H2) \cdot L0/2$						
	Total	m ³	18.522						
Masonry	m ³	4.896	$(W \cdot H - B \cdot h) \cdot L$						
	m ³	2.160	$W1 \cdot t \cdot L1$						
	m ³	1.800	$(L1 - L2) \cdot 2 \cdot h \cdot b1/2$						
	Total	m ³	8.856						
Gravel	m ³	4.608	$(W \cdot L - W1 \cdot L1) \cdot t1$						
	m ³	0.378	$(B \cdot t2 - b2 \cdot H2) \cdot L0/2$						
	Total	m ³	4.986						
Gravel Surfacing	m ²	1.440	$B \cdot L0/2$						
	m ²	1.935	$((B2 - B) \cdot 2)^2 + h^2 \cdot L0/4$						
	m ²	0.240	$b2 \cdot L0/4$						
	Total	m ²	3.615						
Wooden Board	m ²	4.560	$((B - 1) - (B1 - 1)) \cdot h$						

Offtake Works Type O2 Q=0.5 ~ 0.8 m3/s									
Dimensions									
L	L0	L1	L2	L3	W	W1	B	B1	B2
3.1	0.4	3.0	2.0	1.0	2.1	2.1	1.5	1.5	1.8
b	b1	b2	H	H2	h	t	t1	t2	
0.3	0.3	0.2	1.4	1.3	1.1	0.3	0.3	0.2	
Item	Unit	Quantity	Equations						
Excavation	m ³	11.067	$W \cdot L \cdot (H - t1)$						
	m ³	-5.115	$-B \cdot L \cdot h$						
	m ³	8.925	$W1 \cdot (L2 - L3/2) \cdot (H - t1)$						
	m ³	0.330	$(B \cdot t2 - b2 \cdot H2) \cdot L0/2$						
	Total	m ³	15.207						
Masonry	m ³	3.999	$(W \cdot H - B \cdot h) \cdot L$						
	m ³	1.890	$W1 \cdot t \cdot L1$						
	m ³	1.650	$(L1 - L2) \cdot 2 \cdot h \cdot b1/2$						
	Total	m ³	7.539						
Gravel	m ³	3.843	$(W \cdot L - W1 \cdot L1) \cdot t1$						
	m ³	0.330	$(B \cdot t2 - b2 \cdot H2) \cdot L0/2$						
	Total	m ³	4.173						
Gravel Surfacing	m ²	1.200	$B \cdot L0/2$						
	m ²	1.776	$((B2 - B) \cdot 2)^2 + h^2 \cdot L0/4$						
	m ²	0.240	$b2 \cdot L0/4$						
	Total	m ²	3.216						
Wooden Board	m ²	3.520	$((B - 1) - (B1 - 1)) \cdot h$						

BQ of Offtake Works (2/4)

Offtake Works Type O3 Q=0.3 ~ 0.5 m3/s									
Dimensions									
L	L0	L1	L2	L3	W	W1	B	B1	B2
2.8	0.4	3.0	2.0	1.0	1.8	1.8	1.2	1.2	1.5
b	b1	b2	H	H2	h	t	t1	t2	0.0
0.3	0.3	0.2	1.2	1.1	0.9	0.3	0.3	0.2	0.0
Item	Unit	Quantity	Equations						
Excavation	m ³	7.560	$W \cdot L \cdot (H - t1)$						
	m ³	-3.024	$-B \cdot L \cdot h$						
	m ³	6.750	$W1 \cdot (L2 + L3 \cdot 2) \cdot (H - t1)$						
	m ³	0.270	$(B \cdot t2 - b2 \cdot H2) \cdot L0 \cdot 2$						
Total	m ³	11.556							
Masonry	m ³	3.024	$(W \cdot H - B \cdot h) \cdot L$						
	m ³	1.620	$W1 \cdot t \cdot L1$						
	m ³	1.350	$(L1 - L2) \cdot 2 \cdot h \cdot b1 \cdot 2$						
Total	m ³	5.994							
Gravel	m ³	3.132	$(W \cdot L - W1 \cdot L1) \cdot t1$						
	m ³	0.270	$(B \cdot t2 - b2 \cdot H2) \cdot L0 \cdot 2$						
Total	m ³	3.402							
Gravel Surfacing	m ²	0.960	$B \cdot L0 \cdot 2$						
	m ²	1.460	$((B2 - B) \cdot 2)^2 \cdot h^2 \cdot L0 \cdot 4$						
	m ²	0.240	$b2 \cdot L0 \cdot 4$						
Total	m ²	2.660							
Wooden Board	m ²	2.340	$((B - 1) - (B1 - 1)) \cdot h$						

Offtake Works Type O4 Q=0.2 ~ 0.3 m3/s									
Dimensions									
L	L0	L1	L2	L3	W	W1	B	B1	B2
2.6	0.4	3.0	2.0	1.0	1.6	1.6	1.0	1.0	1.3
b	b1	b2	H	H2	h	t	t1	t2	
0.3	0.3	0.2	1.0	0.9	0.7	0.3	0.3	0.2	
Item	Unit	Quantity	Equations						
Excavation	m ³	5.408	$W \cdot L \cdot (H - t1)$						
	m ³	-1.820	$-B \cdot L \cdot h$						
	m ³	5.200	$W1 \cdot (L2 - L3 \cdot 2) \cdot (H - t1)$						
	m ³	0.222	$(B \cdot t2 - b2 \cdot H2) \cdot L0 \cdot 2$						
Total	m ³	9.010							
Masonry	m ³	2.340	$(W \cdot H - B \cdot h) \cdot L$						
	m ³	1.440	$W1 \cdot t \cdot L1$						
	m ³	1.050	$(L1 - L2) \cdot 2 \cdot h \cdot b1 \cdot 2$						
Total	m ³	4.830							
Gravel	m ³	2.688	$(W \cdot L - W1 \cdot L1) \cdot t1$						
	m ³	0.222	$(B \cdot t2 - b2 \cdot H2) \cdot L0 \cdot 2$						
Total	m ³	2.910							
Gravel Surfacing	m ²	0.800	$B \cdot L0 \cdot 2$						
	m ²	1.145	$((B2 - B) \cdot 2)^2 \cdot h^2 \cdot L0 \cdot 4$						
	m ²	0.240	$b2 \cdot L0 \cdot 4$						
Total	m ²	2.185							
Wooden Board	m ²	1.540	$((B - 1) - (B1 - 1)) \cdot h$						

BQ of Offtake Works (3/4)

Offtake Works Type 05 Q=0.1 ~ 0.2 m3/s									
Dimensions									
L	L0	L1	L2	L3	W	W1	B	B1	B2
2.4	0.4	3.0	2.0	1.0	1.4	1.4	0.8	0.8	1.1
b	b1	b2	H	H2	h	t	t1	t2	
0.3	0.3	0.2	0.9	0.8	0.6	0.3	0.3	0.2	
Item	Unit	Quantity	Equations						
Excavation	m ³	4.032	$W \cdot L \cdot (H - t)$						
	m ³	-1.152	$-B \cdot L \cdot h$						
	m ³	4.200	$W1 \cdot (L2 - L3 \cdot 2) \cdot (H - t1)$						
	m ³	0.186	$(B \cdot t2 - b2 \cdot H2) \cdot L0 \cdot 2$						
	Total	7.266							
Masonry	m ³	1.872	$(W \cdot H - B \cdot h) \cdot L$						
	m ³	1.260	$W1 \cdot t \cdot L1$						
	m ³	0.900	$(L1 - L2) \cdot 2 \cdot h \cdot b1 \cdot 2$						
	Total	4.032							
Gravel	m ³	2.268	$(W \cdot L - W1 \cdot L1) \cdot t1$						
	m ³	0.186	$(B \cdot t2 - b2 \cdot H2) \cdot L0 \cdot 2$						
	Total	2.454							
Gravel Surfacing	m ²	0.640	$B \cdot L0 \cdot 2$						
	m ²	0.990	$((B2 - B) \cdot 2)^2 \cdot h^2 \cdot L0 \cdot 4$						
	m ²	0.240	$b2 \cdot L0 \cdot 4$						
	Total	1.870							
Wooden Board	m ²	1.080	$((B - 1) - (B1 - 1)) \cdot h$						

Offtake Works Type 06 Q=0.05 ~ 0.1 m3/s									
Dimensions									
L	L0	L1	L2	L3	W	W1	B	B1	B2
2.2	0.4	3.0	2.0	1.0	1.2	1.2	0.6	0.6	1.0
b	b1	b2	H	H2	h	t	t1	t2	
0.3	0.3	0.1	0.8	0.6	0.5	0.3	0.3	0.1	
Item	Unit	Quantity	Equations						
Excavation	m ³	2.904	$W \cdot L \cdot (H - t1)$						
	m ³	-0.660	$-B \cdot L \cdot h$						
	m ³	3.300	$W1 \cdot (L2 - L3 \cdot 2) \cdot (H - t1)$						
	m ³	0.096	$(B \cdot t2 - b2 \cdot H2) \cdot L0 \cdot 2$						
	Total	5.640							
Masonry	m ³	1.452	$(W \cdot H - B \cdot h) \cdot L$						
	m ³	1.080	$W1 \cdot t \cdot L1$						
	m ³	0.750	$(L1 - L2) \cdot 2 \cdot h \cdot b1 \cdot 2$						
	Total	3.282							
Gravel	m ³	1.872	$(W \cdot L - W1 \cdot L1) \cdot t1$						
	m ³	0.096	$(B \cdot t2 - b2 \cdot H2) \cdot L0 \cdot 2$						
	Total	1.968							
Gravel Surfacing	m ²	0.480	$B \cdot L0 \cdot 2$						
	m ²	0.862	$((B2 - B) \cdot 2)^2 \cdot h^2 \cdot L0 \cdot 4$						
	m ²	0.160	$b2 \cdot L0 \cdot 4$						
	Total	1.502							
Wooden Board	m ²	0.700	$((B - 1) - (B1 - 1)) \cdot h$						

BQ of Offtake Works (4/4)

Offtake Works Type O7 Q=0.03 ~ 0.05 m3/s									
Dimensions									
L	L0	L1	L2	L3	W	W1	B	B1	B2
1.9	0.4	3.0	2.0	1.0	0.9	0.9	0.5	0.5	0.7
b	b1	b2	H	H2	h	t	t1	t2	
0.2	0.2	0.1	0.7	0.5	0.4	0.3	0.3	0.1	
Item	Unit	Quantity	Equations						
Excavation	m ³	1.710	$W \cdot L \cdot (H - t1)$						
	m ³	-0.380	$-B \cdot L \cdot h$						
	m ³	2.250	$W1 \cdot (L2 - L3) \cdot (H - t1)$						
	m ³	0.080	$(B \cdot t2 - b2 \cdot H2) \cdot L0 \cdot 2$						
	m ³	3.660							
Total									
Masonry	m ³	0.817	$(W \cdot H - B \cdot h) \cdot L$						
	m ³	0.810	$W1 \cdot t \cdot L1$						
	m ³	0.400	$(L1 - L2) \cdot 2 \cdot h \cdot b1 \cdot 2$						
	m ³	2.027							
Total									
Gravel	m ³	1.323	$(W \cdot L - W1 \cdot L1) \cdot t1$						
	m ³	0.080	$(B \cdot t2 - b2 \cdot H2) \cdot L0 \cdot 2$						
	m ³	1.403							
Total									
Gravel Surfacing	m ²	0.400	$B \cdot L0 \cdot 2$						
	m ²	0.660	$((B2 - B) \cdot 2)^2 \cdot h^2 \cdot L0 \cdot 4$						
	m ²	0.160	$b2 \cdot L0 \cdot 4$						
	m ²	1.220							
Total									
Wooden Board	m ²	0.480	$((B - 1) - (B1 - 1)) \cdot h$						

Offtake Works Type O8 Q=0.00 ~ 0.03 m3/s

Dimensions									
L	L0	L1	L2	L3	W	W1	B	B1	B2
1.8	0.4	3.0	2.0	1.0	0.8	0.8	0.4	0.4	0.6
b	b1	b2	H	H2	h	t	t1	t2	
0.2	0.2	0.1	0.6	0.4	0.3	0.3	0.3	0.1	
Item	Unit	Quantity	Equations						
Excavation	m ³	1.296	$W \cdot L \cdot (H - t1)$						
	m ³	-0.216	$-B \cdot L \cdot h$						
	m ³	1.800	$W1 \cdot (L2 - L3) \cdot (H - t1)$						
	m ³	0.064	$(B \cdot t2 - b2 \cdot H2) \cdot L0 \cdot 2$						
	m ³	2.944							
Total									
Masonry	m ³	0.648	$(W \cdot H - B \cdot h) \cdot L$						
	m ³	0.720	$W1 \cdot t \cdot L1$						
	m ³	0.300	$(L1 - L2) \cdot 2 \cdot h \cdot b1 \cdot 2$						
	m ³	1.668							
Total									
Gravel	m ³	1.152	$(W \cdot L - W1 \cdot L1) \cdot t1$						
	m ³	0.064	$(B \cdot t2 - b2 \cdot H2) \cdot L0 \cdot 2$						
	m ³	1.216							
Total									
Gravel Surfacing	m ²	0.320	$B \cdot L0 \cdot 2$						
	m ²	0.506	$((B2 - B) \cdot 2)^2 \cdot h^2 \cdot L0 \cdot 4$						
	m ²	0.160	$b2 \cdot L0 \cdot 4$						
	m ²	0.986							
Total									
Wooden Board	m ²	0.300	$((B - 1) - (B1 - 1)) \cdot h$						

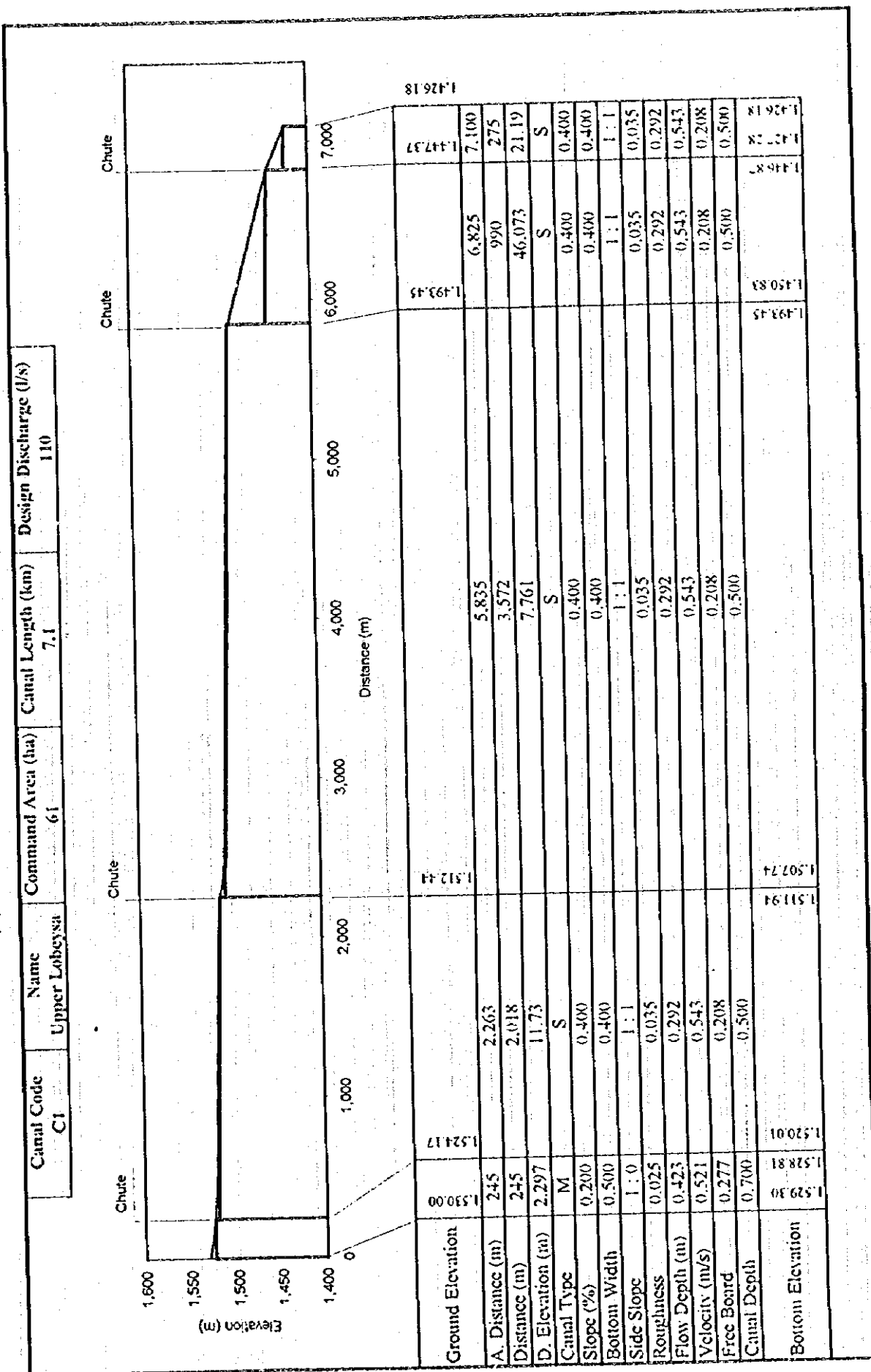
Cost Estimation of Offtake Works (1/2, unit : Nu.)

Offtake Works Type O1 Q=0.8 ~ 1.0 m3/s					
Item	Unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	18.522	30.61	567	E-1
Masonry	m3	8.856	917.08	8,122	C-6
Gravel	m3	4.986	206.60	1,030	E-9
Gravel Surfacing	m2	3.615	367.96	1,330	E-8
Wooden Board	m2	4.560	231.33	1,055	T-1
Others	L.S			2,421	
Transportation	L.S			2,179	
Total				16,703	
Offtake Works Type O2 Q=0.5 ~ 0.8 m3/s					
Item	Unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	15.207	30.61	465	
Masonry	m3	7.539	917.08	6,914	
Gravel	m3	4.173	206.60	862	
Gravel Surfacing	m2	3.216	367.96	1,183	
Wooden Board	m2	3.520	231.33	814	
Others	L.S			2,048	
Transportation	L.S			1,843	
Total				14,130	
Offtake Works Type O3 Q=0.3 ~ 0.5 m3/s					
Item	Unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	11.556	30.61	354	
Masonry	m3	5.994	917.08	5,497	
Gravel	m3	3.402	206.60	703	
Gravel Surfacing	m2	2.660	367.96	979	
Wooden Board	m2	2.340	231.33	541	
Others	L.S			1,615	
Transportation	L.S			4,844	
Total				14,532	
Offtake Works Type O4 Q=0.2 ~ 0.3 m3/s					
Item	Unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	9.010	30.61	276	
Masonry	m3	4.830	917.08	4,429	
Gravel	m3	2.910	206.60	601	
Gravel Surfacing	m2	2.185	367.96	804	
Wooden Board	m2	1.540	231.33	356	
Others	L.S			1,293	
Transportation	L.S			1,164	
Total				8,924	

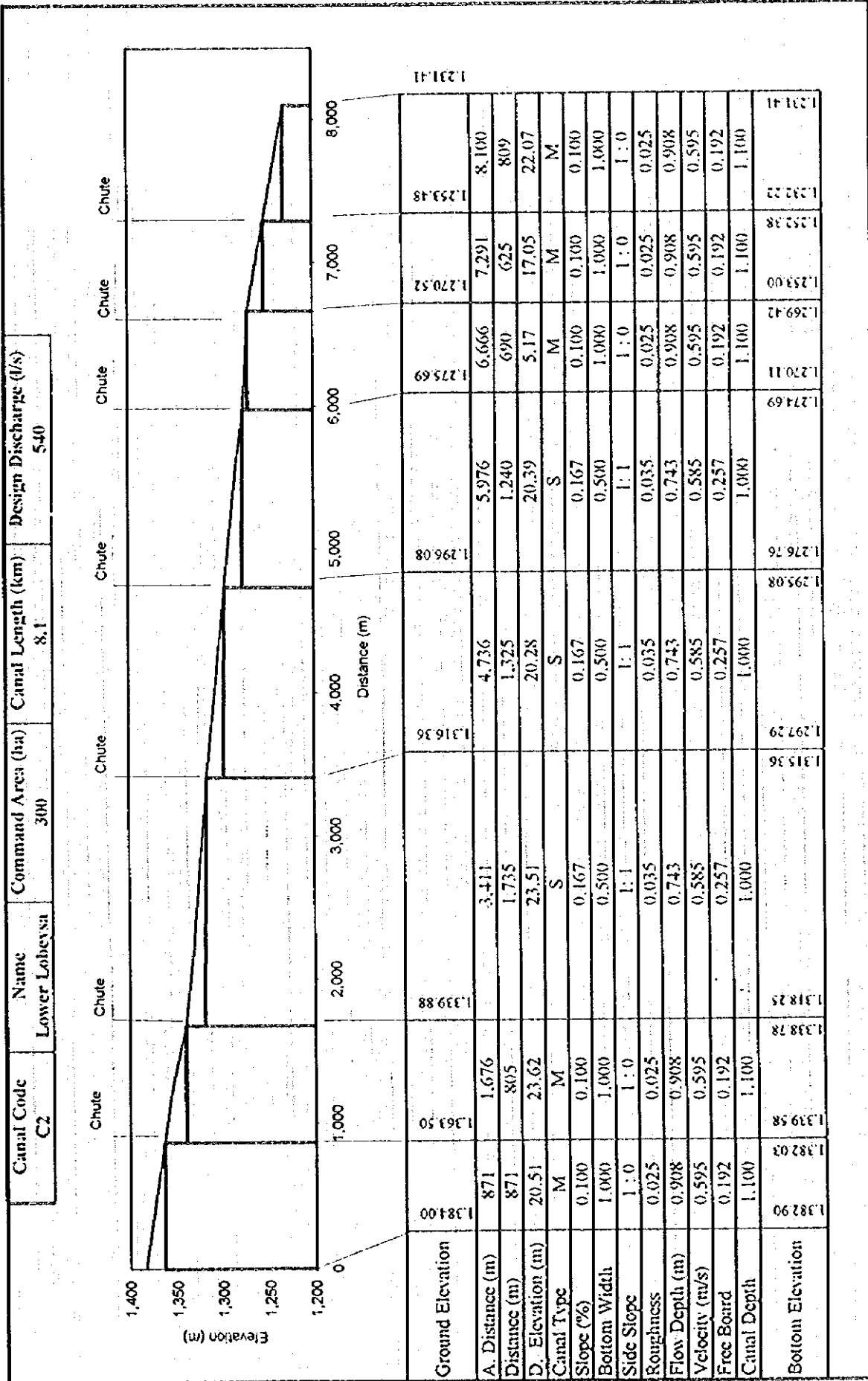
Cost Estimation of Offtake Works (2/2, unit : Nu.)

Offtake Works Type O5 Q=0.1 ~ 0.2 m3/s					
Item	Unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	7.266	30.61	222	
Masonry	m3	4.032	917.08	3,698	
Gravel	m3	2.454	206.60	507	
Gravel Surfacing	m2	1.870	367.96	688	
Wooden Board	m2	1.080	231.33	250	
Others	L.S			1,073	
Transportation	L.S			966	
Total				7,403	
Offtake Works Type O6 Q=0.05 ~ 0.1 m3/s					
Item	Unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	5.640	30.61	173	
Masonry	m3	3.282	917.08	3,010	
Gravel	m3	1.968	206.60	407	
Gravel Surfacing	m2	1.502	367.96	553	
Wooden Board	m2	0.700	231.33	162	
Others	L.S			861	
Transportation	L.S			775	
Total				5,939	
Offtake Works Type O7 Q=0.03 ~ 0.05 m3/s					
Item	Unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	3.660	30.61	112	
Masonry	m3	2.027	917.08	1,859	
Gravel	m3	1.403	206.60	290	
Gravel Surfacing	m2	1.220	367.96	449	
Wooden Board	m2	0.480	231.33	111	
Others	L.S			564	
Transportation	L.S			508	
Total				3,893	
Offtake Works Type O8 Q=0.00 ~ 0.03 m3/s					
Item	Unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	2.944	30.61	90	
Masonry	m3	1.668	917.08	1,530	
Gravel	m3	1.216	206.60	251	
Gravel Surfacing	m2	0.986	367.96	363	
Wooden Board	m2	0.300	231.33	69	
Others	L.S			461	
Transportation	L.S			415	
Total				3,178	

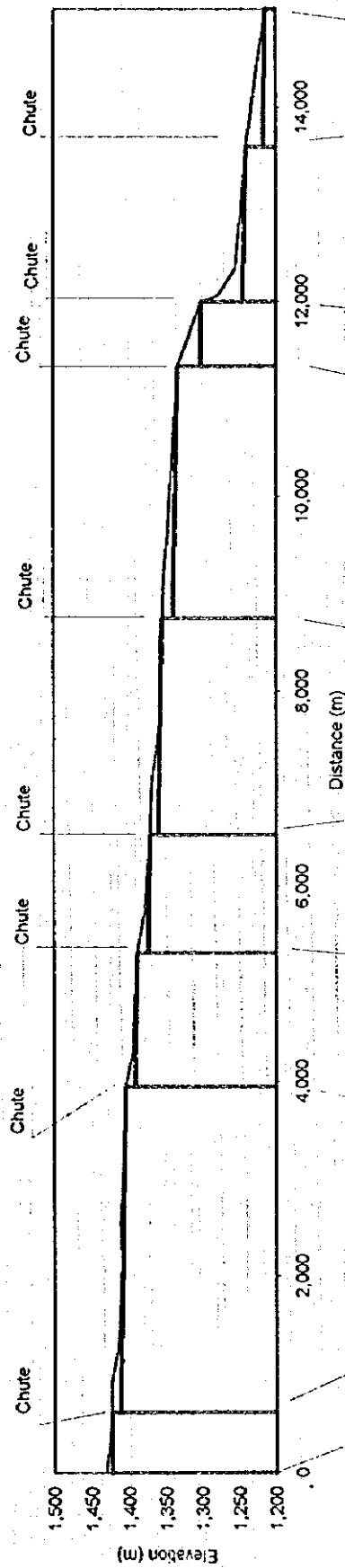
(2) Preliminary Canal Improvement Plan (1/10)



(2) Preliminary Canal Improvement Plan (2/10)



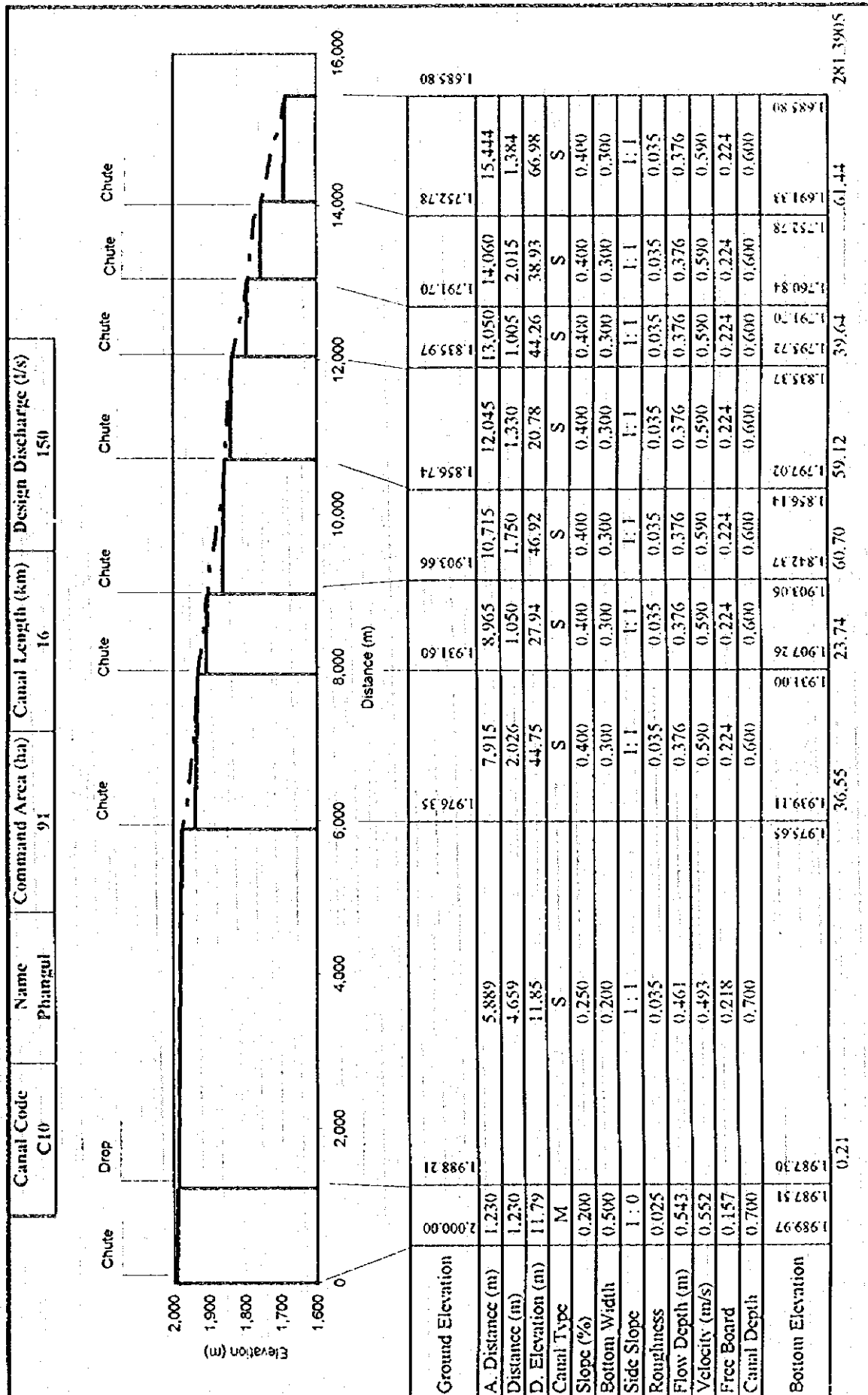
Canal Code	Name	Command Area (ha)	Canal Length (km)	Design Discharge (l/s)
C9	Bajo Canal	143	15	260



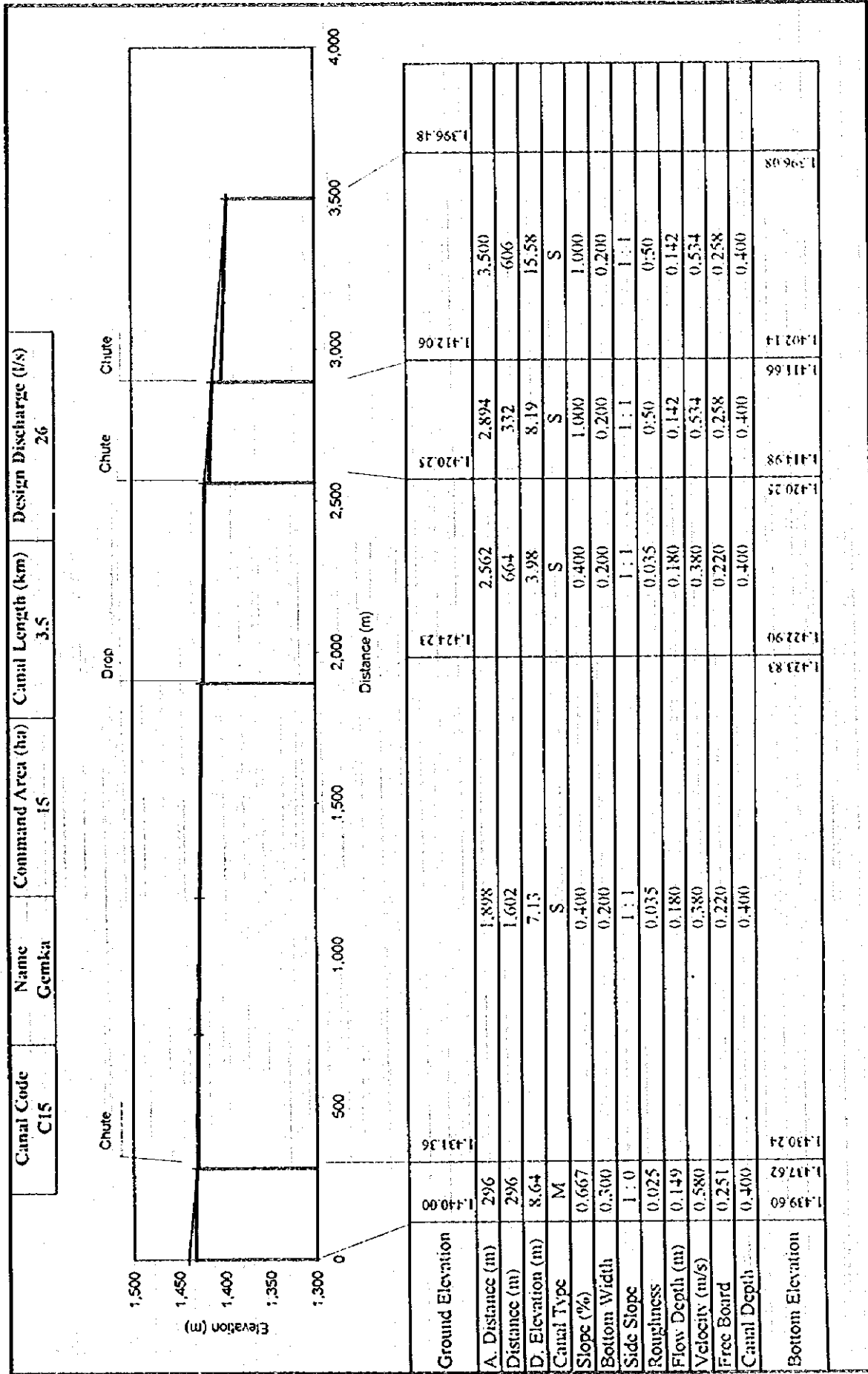
Ground Elevation	1.431.56	1.423.22	1.403.33	1.391.31	1.387.89	1.373.10	1.370.07	1.359.99	1.354.43	1.339.83	1.333.38	1.303.43	1.301.78	1.294.17	1.240.18	1.217.56	1.214.04
A. Distance (m)	614	3.947		5.316	6.531	8.757			11.337			11.997	13.592		15.000		
Distance (m)	614	3.333		1.369	1.215	2.226			2.580			660	1.595		1.408		
D. Elevation (m)	8.34	19.19		15.44	7.761	16			21.05			31.60	60.91		26.83		
Canal Type	M	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Slope (%)	0.143	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
Bottom Width	0.800	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
Side Slope	1:0	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1
Roughness	0.025	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035
Flow Depth (m)	0.566	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472	0.472
Velocity (m/s)	0.575	0.567	0.567	0.567	0.567	0.567	0.567	0.567	0.567	0.567	0.567	0.567	0.567	0.567	0.567	0.567	0.567
Free Board	0.234	0.228	0.228	0.228	0.228	0.228	0.228	0.228	0.228	0.228	0.228	0.228	0.228	0.228	0.228	0.228	0.228
Canal Depth	0.800	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700
Bottom Elevation	1.430.76	1.429.88	1.411.66	1.403.33	1.391.31	1.387.89	1.373.10	1.370.07	1.359.99	1.354.43	1.339.83	1.333.38	1.303.43	1.301.78	1.294.17	1.240.18	1.214.04

General Profile Data 2

(2) Preliminary Canal Improvement Plan (4/10)

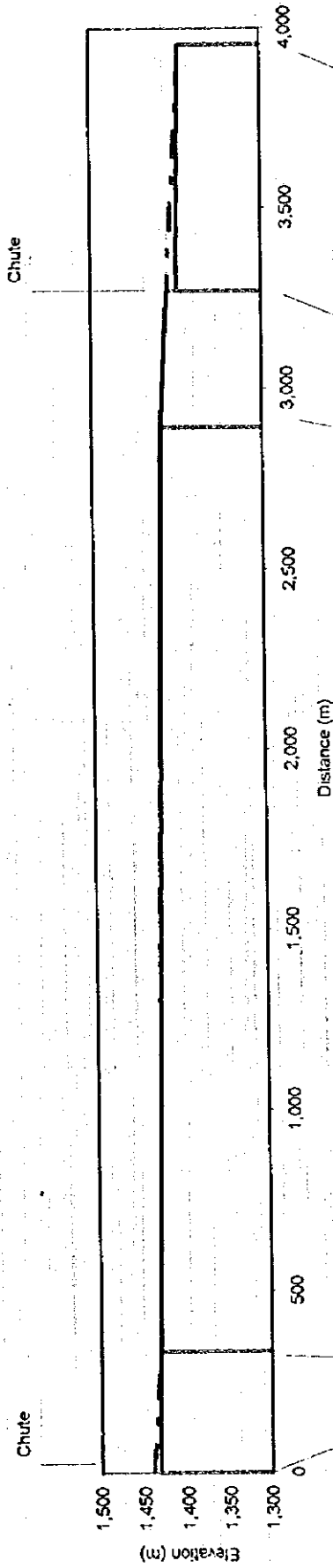


(2) Preliminary Canal Improvement Plan (5)



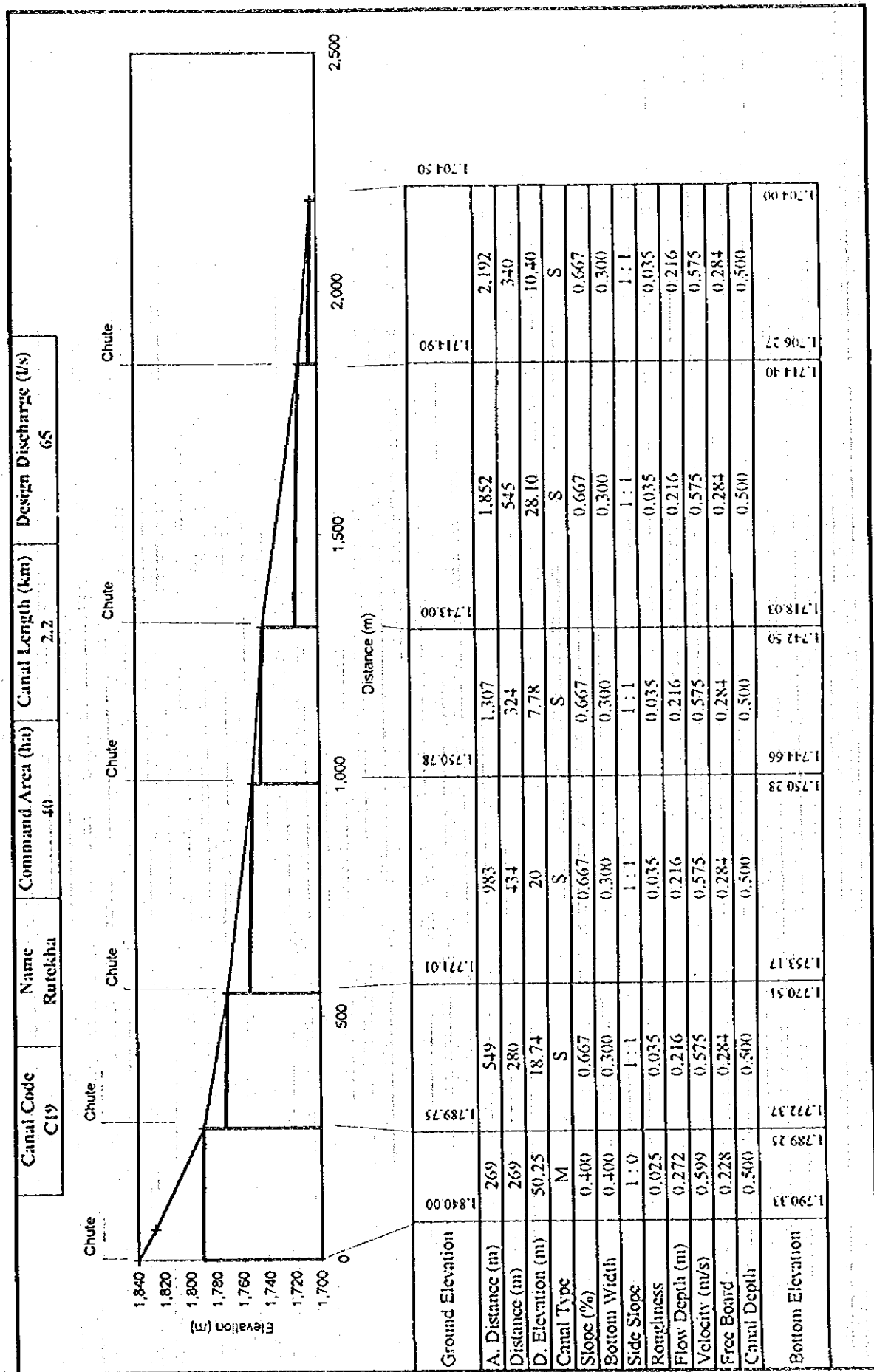
(2) Preliminary Canal Improvement Plan (6)

Canal Code C18	Name Nalakra	Command Area (ha) 29	Canal Length (km) 3.9	Design Discharge (l/s) 48
-------------------	-----------------	-------------------------	--------------------------	------------------------------

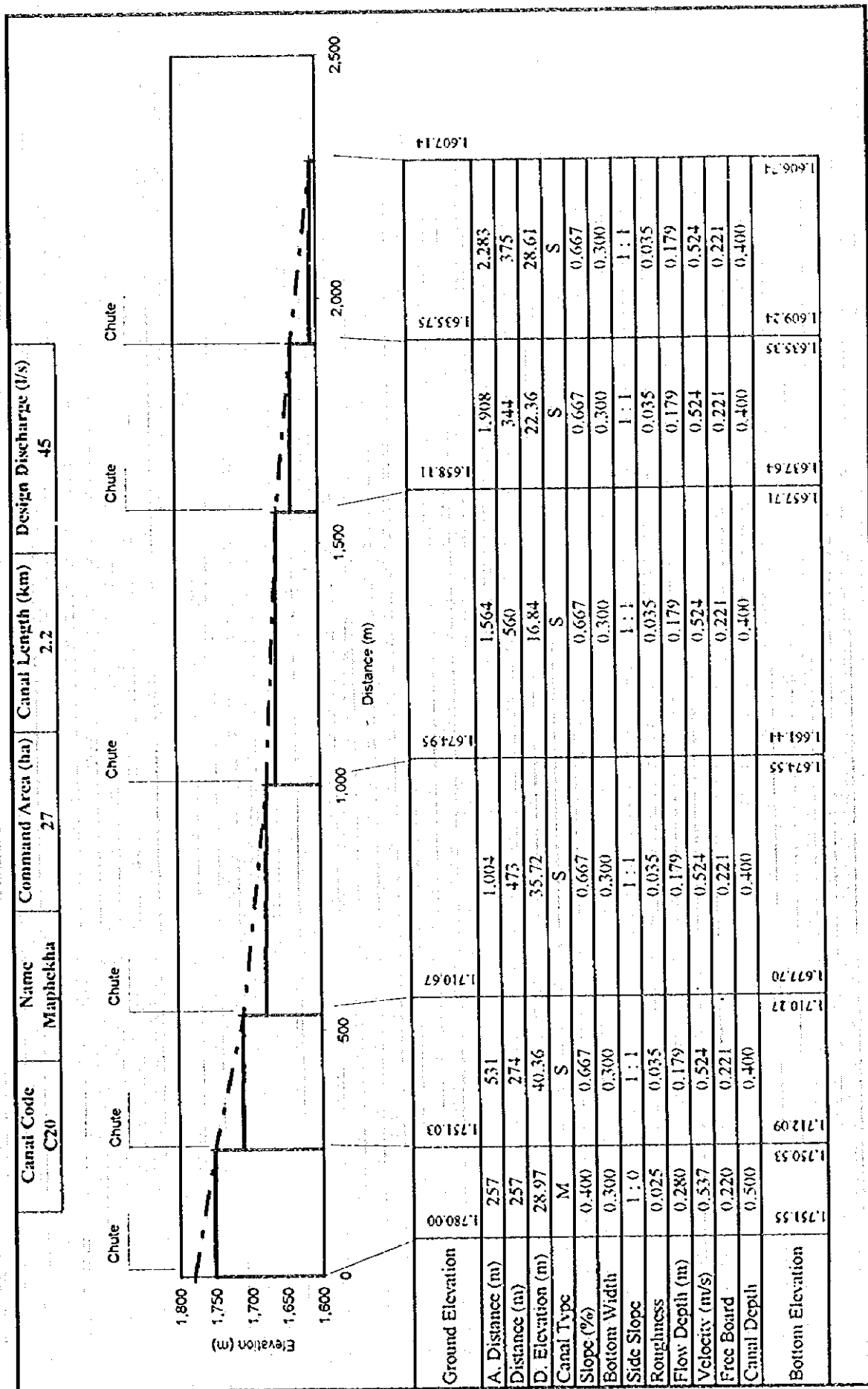


Ground Elevation	1,440.00	1,431.36	1,420.25	1,412.06	1,396.48
A. Distance (m)	335	2,895	3,270	3,955	
Distance (m)	335	2,560	375	685	
D. Elevation (m)	8.64	11.11	8.19	15.58	
Canal Type	M	S	S	S	
Slope (%)	0.500	0.667	0.667	0.667	
Bottom Width	0.300	0.300	0.300	0.300	
Side Slope	1:0	1:1	1:1	1:1	
Roughness	0.025	0.035	0.035	0.035	
Flow Depth (m)	0.269	0.186	0.186	0.186	
Velocity (m/s)	0.594	0.534	0.534	0.534	
Free Board	0.231	0.214	0.214	0.214	
Canal Depth	0.500	0.400	0.400	0.400	
Bottom Elevation	1,432.53	1,430.86	1,413.79	1,411.29	1,396.48

(2) Preliminary Canal Improvement Plan (7/10)

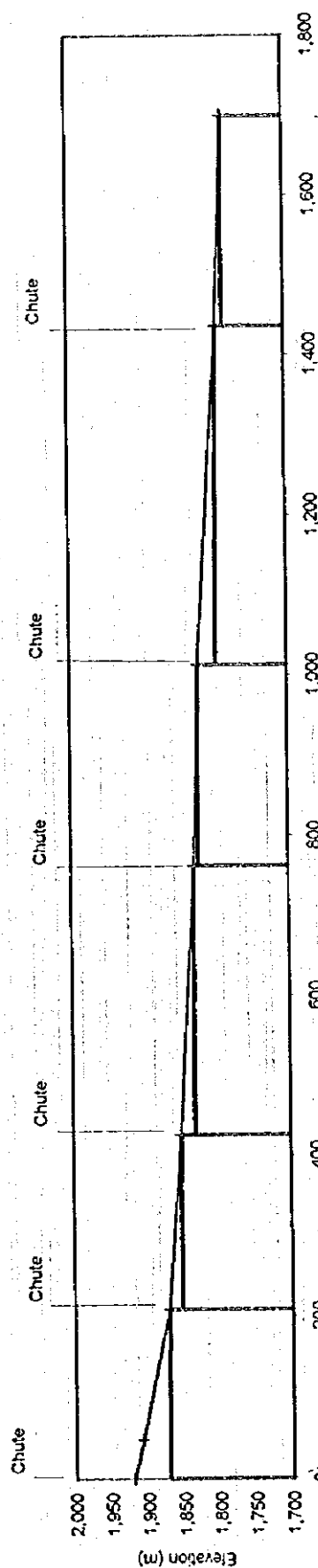


(2) Preliminary Canal Improvement Plan (8/10)



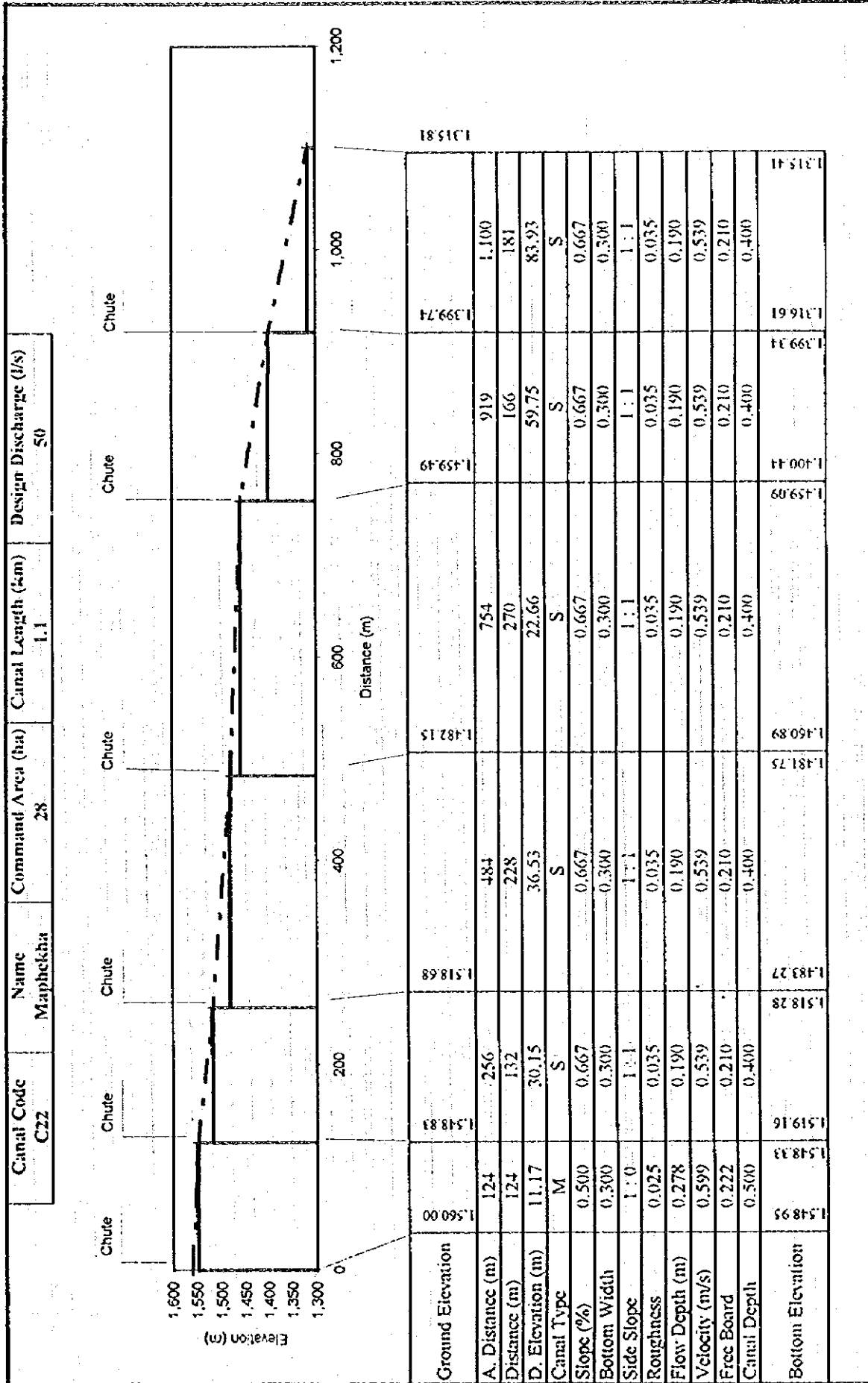
(2) Preliminary Canal Improvement Plan (9/10)

Canal Code	Name	Command Area (ha)	Canal Length (km)	Design Discharge (l/s)
C21	Naykoyuwa	24	1.7	40



	0	200	400	600	800	1,000	1,200	1,400	1,600	1,800
Ground Elevation	1,920.00	1,869.75	1,851.01		1,830.78		1,823.00		1,794.50	1,784.50
A. Distance (m)	209	426		762		1,014	1,436		1,700	
Distance (m)	209	217		337		251	423		264	
D. Elevation (m)	50.25	18.74		20		7.78	28.10		10.40	
Canal Type	M	S		S		S	S		S	
Slope (%)	0.500	0.667		0.667		0.667	0.667		0.667	
Bottom Width	0.300	0.300		0.300		0.300	0.300		0.300	
Side Slope	1:0	1:1		1:1		1:1	1:1		1:1	
Roughness	0.025	0.035		0.035		0.035	0.035		0.035	
Flow Depth (m)	0.231	0.168		0.168		0.168	0.168		0.168	
Velocity (m/s)	0.572	0.507		0.507		0.507	0.507		0.507	
Free Board	0.262	0.232		0.232		0.232	0.232		0.232	
Canal Depth	0.600	0.400		0.400		0.400	0.400		0.400	
Bottom Elevation	1,870.19	1,869.15	1,852.05	1,850.61	1,832.62	1,830.38	1,824.27	1,822.60	1,794.50	1,784.50

(2) Preliminary Canal Improvement Plan (10/10)



Applying Portion of Protection Works (for Additional Cost)

Vulnerability Index	Over 60	55	50	45	40	35
Protection Work Type PA	6.00%	3.00%	1.00%			
Protection Work Type PB			3.00%	1.00%		
Protection Work Type PC			3.00%	1.00%		
Protection Work Type PD				4.00%	3.00%	2.00%
Steel Flume Aqueduct	0.80%	0.60%	0.40%	0.20%		
Pipe Canal Work	2.00%	1.00%	0.60%	0.20%		

Estimated BQ of Protection Works (1/2)

Code C1 Upper Lobeysa

Vulnerability Index	Over 60	55	50	45	40	35	Length (m)
Protection Work Type PA	0.00	0.00	7.00	0.00	0.00	0.00	7.00
Protection Work Type PB	0.00	0.00	21.00	4.00	0.00	0.00	25.00
Protection Work Type PC	0.00	0.00	21.00	4.00	0.00	0.00	25.00
Protection Work Type PD	0.00	0.00	0.00	16.00	55.20	62.00	133.20
Steel Flume Aqueduct	0.00	0.00	2.80	0.80	0.00	0.00	3.60
Pipe Canal Work	0.00	0.00	4.20	0.80	0.00	0.00	5.00

Code C2 Lower Lobeysa

Vulnerability Index	Over 60	55	50	45	40	35	Length (m)
Protection Work Type PA	7.80	7.20	6.50	0.00	0.00	0.00	21.50
Protection Work Type PB	0.00	0.00	19.50	3.60	0.00	0.00	23.10
Protection Work Type PC	0.00	0.00	19.50	3.60	0.00	0.00	23.10
Protection Work Type PD	0.00	0.00	0.00	14.40	61.80	73.20	149.40
Steel Flume Aqueduct	1.04	1.44	2.60	0.72	0.00	0.00	5.80
Pipe Canal Work	2.60	2.40	3.90	0.72	0.00	0.00	9.62

Code C9 Bajo

Vulnerability Index	Over 60	55	50	45	40	35	Length (m)
Protection Work Type PA	159.00	63.60	13.30	0.00	0.00	0.00	235.90
Protection Work Type PB	0.00	0.00	39.90	0.00	0.00	0.00	39.90
Protection Work Type PC	0.00	0.00	39.90	0.00	0.00	0.00	39.90
Protection Work Type PD	0.00	0.00	0.00	0.00	135.30	41.40	176.70
Steel Flume Aqueduct	21.20	12.72	5.32	0.00	0.00	0.00	39.24
Pipe Canal Work	53.00	21.20	7.98	0.00	0.00	0.00	82.18

Code C10 Phangyul

Vulnerability Index	Over 60	55	50	45	40	35	Length (m)
Protection Work Type PA	52.20	30.60	19.40	0.00	0.00	0.00	102.20
Protection Work Type PB	0.00	0.00	58.20	14.10	0.00	0.00	72.30
Protection Work Type PC	0.00	0.00	58.20	14.10	0.00	0.00	72.30
Protection Work Type PD	0.00	0.00	0.00	56.40	82.20	88.60	227.20
Steel Flume Aqueduct	6.96	6.12	7.76	2.82	0.00	0.00	23.66
Pipe Canal Work	17.40	10.20	11.64	2.82	0.00	0.00	42.06

Estimated BQ of Protection Works (2/2)

Code C15

Gemkha

Vulnerability Index	Over 60	55	50	45	40	35	Length (m)
Protection Work Type PA	0.00	5.10	0.00	0.00	0.00	0.00	5.10
Protection Work Type PB	0.00	0.00	0.00	17.90	0.00	0.00	17.90
Protection Work Type PC	0.00	0.00	0.00	17.90	0.00	0.00	17.90
Protection Work Type PD	0.00	0.00	0.00	71.60	14.70	15.80	102.10
Steel Flume Aqueduct	0.00	1.02	0.00	3.58	0.00	0.00	4.60
Pipe Canal Work	0.00	1.70	0.00	3.58	0.00	0.00	5.28

Code C18

Nalakha

Vulnerability Index	Over 60	55	50	45	40	35	Length (m)
Protection Work Type PA	16.20	22.50	0.00	0.00	0.00	0.00	38.70
Protection Work Type PB	0.00	0.00	0.00	15.10	0.00	0.00	15.10
Protection Work Type PC	0.00	0.00	0.00	15.10	0.00	0.00	15.10
Protection Work Type PD	0.00	0.00	0.00	60.40	20.70	9.60	90.70
Steel Flume Aqueduct	2.16	4.50	0.00	3.02	0.00	0.00	9.68
Pipe Canal Work	5.40	7.50	0.00	3.02	0.00	0.00	15.92

Code C19

Rutekha

Vulnerability Index	Over 60	55	50	45	40	35	Length (m)
Protection Work Type PA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Protection Work Type PB	0.00	0.00	0.00	1.50	0.00	0.00	1.50
Protection Work Type PC	0.00	0.00	0.00	1.50	0.00	0.00	1.50
Protection Work Type PD	0.00	0.00	0.00	6.00	0.00	29.80	35.80
Steel Flume Aqueduct	0.00	0.00	0.00	0.30	0.00	0.00	0.30
Pipe Canal Work	0.00	0.00	0.00	0.30	0.00	0.00	0.30

Code C20

Maphekha

Vulnerability Index	Over 60	55	50	45	40	35	Length (m)
Protection Work Type PA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Protection Work Type PB	0.00	0.00	0.00	2.10	0.00	0.00	2.10
Protection Work Type PC	0.00	0.00	0.00	2.10	0.00	0.00	2.10
Protection Work Type PD	0.00	0.00	0.00	8.40	18.00	8.20	34.60
Steel Flume Aqueduct	0.00	0.00	0.00	0.42	0.00	0.00	0.42
Pipe Canal Work	0.00	0.00	0.00	0.42	0.00	0.00	0.42

Code C21

Naykoyuwa

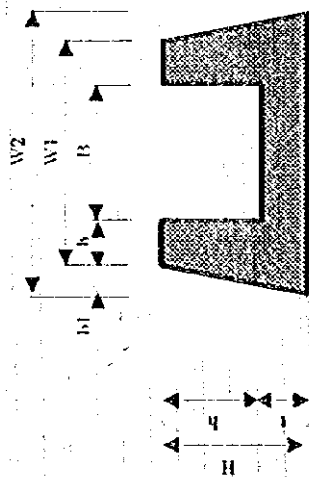
Vulnerability Index	Over 60	55	50	45	40	35	Length (m)
Protection Work Type PA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Protection Work Type PB	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Protection Work Type PC	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Protection Work Type PD	0.00	0.00	0.00	0.00	0.00	6.60	6.60
Steel Flume Aqueduct	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pipe Canal Work	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Code C22

Rumina

Vulnerability Index	Over 60	55	50	45	40	35	Length (m)
Protection Work Type PA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Protection Work Type PB	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Protection Work Type PC	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Protection Work Type PD	0.00	0.00	0.00	0.00	6.60	7.60	14.20
Steel Flume Aqueduct	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pipe Canal Work	0.00	0.00	0.00	0.00	0.00	0.00	0.00

(3) Typical Section of Masonry Canal and Dimensions



Dimensions

Type Code M1	Type Code M2	Type Code M3	Type Code M4	Type Code M5	Type Code M6	Type Code M7
Design Discharge (l/s)	Design Discharge (l/s)	Design Discharge (l/s)	Design Discharge (l/s)	Design Discharge (l/s)	Design Discharge (l/s)	Design Discharge (l/s)
270 ~ 540	140 ~ 290	75 ~ 150	0.036 ~ 0.072	0.036 ~ 0.072	0.027 ~ 0.054	0.018 ~ 0.036
B	B	B	B	B	B	B
b	b	b	b	b	b	b
b1	b1	b1	b1	b1	b1	b1
W1	W1	W1	W1	W1	W1	W1
W2	W2	W2	W2	W2	W2	W2
H	H	H	H	H	H	H
h	h	h	h	h	h	h
t	t	t	t	t	t	t

Bill of Quantity of Masonry Canal (unit/m)

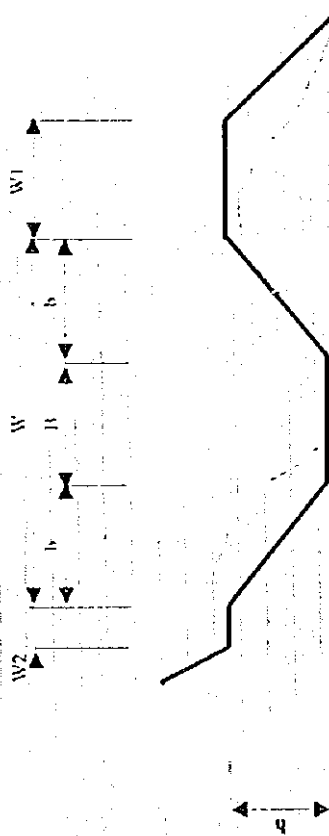
Masonry Canal Type M1 (Q=270 ~ 540 l/s)							
Dimensions							
B	b	b1	W1	W2	H	h	t
1.000	0.300	0.200	1.600	2.000	1.400	1.100	0.300
Description	unit	Quantity	Equations				
Excavation	m ³	1.700	W2*H-B*h				
Backfill	m ³	0.280	b1*H				
Wet Masonry	m ³	1.420	(W1+W2)/2*H-B*h				
Masonry Canal Type M2 (Q=140 ~ 290 l/s)							
Dimensions							
B	b	b1	W1	W2	H	h	t
0.800	0.300	0.150	1.400	1.700	1.100	0.800	0.300
Description	unit	Quantity	Equations				
Excavation	m ³	1.230	W2*H-B*h				
Backfill	m ³	0.165	b1*H				
Wet Masonry	m ³	1.065	(W1+W2)/2*H-B*h				
Masonry Canal Type M3 (Q=75 ~ 150 l/s)							
Dimensions							
B	b	b1	W1	W2	H	h	t
0.500	0.300	0.100	1.100	1.300	1.000	0.700	0.300
Description	unit	Quantity	Equations				
Excavation	m ³	0.950	W2*H-B*h				
Backfill	m ³	0.100	b1*H				
Wet Masonry	m ³	0.850	(W1+W2)/2*H-B*h				
Masonry Canal Type M4 (Q=36 ~ 72 l/s)							
Dimensions							
B	b	b1	W1	W2	H	h	t
0.400	0.300	0.150	1.000	1.300	0.800	0.500	0.300
Description	unit	Quantity	Equations				
Excavation	m ³	0.840	W2*H-B*h				
Backfill	m ³	0.120	b1*H				
Wet Masonry	m ³	0.720	(W1+W2)/2*H-B*h				
Masonry Canal Type M5 (Q=36 ~ 72 l/s)							
Dimensions							
B	b	b1	W1	W2	H	h	t
0.300	0.300	0.150	0.900	1.200	0.900	0.600	0.300
Description	unit	Quantity	Equations				
Excavation	m ³	0.900	W2*H-B*h				
Backfill	m ³	0.135	b1*H				
Wet Masonry	m ³	0.765	(W1+W2)/2*H-B*h				
Masonry Canal Type M6 (Q=27 ~ 54 l/s)							
Dimensions							
B	b	b1	W1	W2	H	h	t
0.300	0.300	0.150	0.900	1.200	0.800	0.500	0.300
Description	unit	Quantity	Equations				
Excavation	m ³	0.810	W2*H-B*h				
Backfill	m ³	0.120	b1*H				
Wet Masonry	m ³	0.690	(W1+W2)/2*H-B*h				
Masonry Canal Type M7 (Q=18 ~ 36 l/s)							
Dimensions							
B	b	b1	W1	W2	H	h	t
0.300	0.300	0.150	0.900	1.200	0.700	0.400	0.300
Description	unit	Quantity	Equations				
Excavation	m ³	0.720	W2*H-B*h				
Backfill	m ³	0.105	b1*H				
Wet Masonry	m ³	0.615	(W1+W2)/2*H-B*h				

Unit Construction Cost of Masonry Canal (1/2, unit : Nu./m)

Masonry Canal Type M1 (Q=270 ~ 540 l/s)					
Description	unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	1.7	30.61	52	E-1
Backfill	m3	0.28	15.38	4	E-3
Wet Masonry	m3	1.42	917.08	1,302	C-6
Others	L.S			272	
Transportation	L.S			245	
Total				1,875	
Masonry Canal Type M2 (Q=140 ~ 290 l/s)					
Description	unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	1.23	30.61	38	
Backfill	m3	0.165	15.38	3	
Wet Masonry	m3	1.065	917.08	977	
Others	L.S			203	
Transportation	L.S			183	
Total				1,403	
Masonry Canal Type M3 (Q=75 ~ 150 l/s)					
Description	unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	0.95	30.61	29	
Backfill	m3	0.1	15.38	2	
Wet Masonry	m3	0.85	917.08	780	
Others	L.S			162	
Transportation	L.S			486	
Total				1,458	
Masonry Canal Type M4 (Q=36 ~ 72 l/s)					
Description	unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	0.84	30.61	26	
Backfill	m3	0.12	15.38	2	
Wet Masonry	m3	0.72	917.08	660	
Others	L.S			138	
Transportation	L.S			124	
Total				949	
Masonry Canal Type M5 (Q=36 ~ 72 l/s)					
Description	unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	0.9	30.61	28	
Backfill	m3	0.135	15.38	2	
Wet Masonry	m3	0.765	917.08	702	
Others	L.S			146	
Transportation	L.S			132	
Total				1,009	

Unit Construction Cost of Masonry Canal (2/2, unit : Nu./m)

Masonry Canal Type M6 (Q=27 ~ 54 l/s)					
Description	unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	0.81	30.61	25	
Backfill	m3	0.12	15.38	2	
Wet Masonry	m3	0.69	917.08	633	
Others	L.S			132	
Transportation	L.S			119	
Total				910	
Masonry Canal Type M7 (Q=18 ~ 36 l/s)					
Description	unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	0.72	30.61	22	
Backfill	m3	0.105	15.38	2	
Wet Masonry	m3	0.615	917.08	564	
Others	L.S			118	
Transportation	L.S			106	
Total				811	



Dimensions

Type Code	S1	Type Code	S2	Type Code	S3	Type Code	S4	Type Code	S5	Type Code	S6	Type Code	S7	Type Code	S8	Type Code	S9
Design Discharge (l/s)		Design Discharge (l/s)		Design Discharge (l/s)		Design Discharge (l/s)		Design Discharge (l/s)		Design Discharge (l/s)		Design Discharge (l/s)		Design Discharge (l/s)		Design Discharge (l/s)	
B	0.500	B	0.500	B	0.400	B	0.300	B	0.300	B	0.300	B	0.300	B	0.200	B	0.200
b	1.000	b	0.700	b	0.500	b	0.600	b	0.600	b	0.500	b	0.400	b	0.700	b	0.400
W	2.500	W	1.900	W	1.400	W	1.500	W	1.500	W	1.300	W	1.100	W	1.600	W	1.000
W1	0.600	W1	0.600	W1	0.600	W1	0.600	W1	0.600	W1	0.600	W1	0.600	W1	0.600	W1	0.600
W2	0.300	W2	0.300	W2	0.300	W2	0.300	W2	0.300	W2	0.300	W2	0.300	W2	0.300	W2	0.300
h	1.000	h	0.700	h	0.500	h	0.700	h	0.600	h	0.500	h	0.400	h	0.700	h	0.400

BQ of Earth Lining Canal (1/2)

Earth Lining Canal Type S1 (Q=320 ~ 624 l/s)					
Dimensions					
B	b	W	W1	W2	h
0.500	1.000	2.500	0.600	0.300	1.000
Description	unit	Quantity	Equations		
Excavation	m3	0.750	$(W+B)/2 \cdot h \cdot 0.5$		
Embankment	m3	0.300	$W1 \cdot h/2$		
Lining	m2	3.328	$B+2^{0.5} \cdot b \cdot 2$		
Earth Lining Canal Type S2 (Q=150 ~ 300 l/s)					
Dimensions					
B	b	W	W1	W2	h
0.500	0.700	1.900	0.600	0.300	0.700
Description	unit	Quantity	Equations		
Excavation	m3	0.420	$(W+B)/2 \cdot h \cdot 0.5$		
Embankment	m3	0.210	$W1 \cdot h/2$		
Lining	m2	2.480	$B+20.5 \cdot b \cdot 2$		
Earth Lining Canal Type S3 (Q=63 ~ 126 l/s)					
Dimensions					
B	b	W	W1	W2	h
0.400	0.500	1.400	0.600	0.300	0.500
Description	unit	Quantity	Equations		
Excavation	m3	0.225	$(W+B)/2 \cdot h \cdot 0.5$		
Embankment	m3	0.150	$W1 \cdot h/2$		
Lining	m2	1.814	$B+20.5 \cdot b \cdot 2$		
Earth Lining Canal Type S4 (Q=120 ~ 240 l/s)					
Dimensions					
B	b	W	W1	W2	h
0.300	0.600	1.500	0.600	0.300	0.700
Description	unit	Quantity	Equations		
Excavation	m3	0.315	$(W+B)/2 \cdot h \cdot 0.5$		
Embankment	m3	0.210	$W1 \cdot h/2$		
Lining	m2	1.997	$B+20.5 \cdot b \cdot 2$		
Earth Lining Canal Type S5 (Q=84 ~ 168 l/s)					
Dimensions					
B	b	W	W1	W2	h
0.300	0.600	1.500	0.600	0.300	0.600
Description	unit	Quantity	Equations		
Excavation	m3	0.270	$(W+B)/2 \cdot h \cdot 0.5$		
Embankment	m3	0.180	$W1 \cdot h/2$		
Lining	m2	1.997	$B+20.5 \cdot b \cdot 2$		
Earth Lining Canal Type S6 (Q=54 ~ 108 l/s)					
Dimensions					
B	b	W	W1	W2	h
0.300	0.500	1.300	0.600	0.300	0.500
Description	unit	Quantity	Equations		
Excavation	m3	0.200	$(W+B)/2 \cdot h \cdot 0.5$		
Embankment	m3	0.150	$W1 \cdot h/2$		
Lining	m2	1.714	$B+20.5 \cdot b \cdot 2$		

BQ of Earth Lining Canal (2/2)

Earth Lining Canal Type S7 (Q=30 ~ 60 l/s)					
Dimensions					
B	b	W	W1	W2	h
0.300	0.400	1.100	0.600	0.300	0.400
Description	unit	Quantity	Equations		
Excavation	m3	0.140	$(W+B)/2 * h * 0.5$		
Embankment	m3	0.120	$W1 * h / 2$		
Lining	m2	1.431	$B + 20.5 * b * 2$		
Earth Lining Canal Type S8 (Q=105 ~ 210 l/s)					
Dimensions					
B	b	W	W1	W2	h
0.200	0.700	1.600	0.600	0.300	0.700
Description	unit	Quantity	Equations		
Excavation	m3	0.315	$(W+B)/2 * h * 0.5$		
Embankment	m3	0.210	$W1 * h / 2$		
Lining	m2	2.180	$B + 20.5 * b * 2$		
Earth Lining Canal Type S9 (Q=24 ~ 48 l/s)					
Dimensions					
B	b	W	W1	W2	h
0.200	0.400	1.000	0.600	0.300	0.400
Description	unit	Quantity	Equations		
Excavation	m3	0.120	$(W+B)/2 * h * 0.5$		
Embankment	m3	0.120	$W1 * h / 2$		
Lining	m2	1.331	$B + 20.5 * b * 2$		
Earth Lining Canal Type S10 (Q=15 ~ 30 l/s)					
Dimensions					
B	b	W	W1	W2	h
0.400	0.300	1.000	0.600	0.300	0.300
Description	unit	Quantity	Equations		
Excavation	m3	0.105	$(W+B)/2 * h * 0.5$		
Embankment	m3	0.090	$W1 * h / 2$		
Lining	m2	1.249	$B + 20.5 * b * 2$		

Unit Construction Cost of Earth Lining Canal (1/2, unit : Nu./m)

Earth Lining Canal Type S1 (Q=320 ~ 624 l/s)					
Description	Unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	0.750	30.61	23	E-1
Embankment	m3	0.300	34.56	10	E-5
Lining	m2	3.328	8.75	29	E-7
Others	L.S			12	
Transportation	L.S			11	
Total				86	
Earth Lining Canal Type S2 (Q=150 ~ 300 l/s)					
Description	Unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	0.420	30.61	13	
Embankment	m3	0.210	34.56	7	
Lining	m2	2.480	8.75	22	
Others	L.S			8	
Transportation	L.S			8	
Total				58	
Earth Lining Canal Type S3 (Q=63 ~ 126 l/s)					
Description	Unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	0.225	30.61	7	
Embankment	m3	0.150	34.56	5	
Lining	m2	1.814	8.75	16	
Others	L.S			6	
Transportation	L.S			17	
Total				50	
Earth Lining Canal Type S4 (Q=120 ~ 240 l/s)					
Description	Unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	0.315	30.61	10	
Embankment	m3	0.210	34.56	7	
Lining	m2	1.997	8.75	17	
Others	L.S			7	
Transportation	L.S			6	
Total				47	
Earth Lining Canal Type S5 (Q=84 ~ 168 l/s)					
Description	Unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	0.270	30.61	8	
Embankment	m3	0.180	34.56	6	
Lining	m2	1.997	8.75	17	
Others	L.S			6	
Transportation	L.S			6	
Total				44	

Unit Construction Cost of Earth Lining Canal (2/2, unit : Nu./m)

Earth Lining Canal Type S6 (Q=54 ~ 108 l/s)					
Description	Unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	0.200	30.61	6	
Embankment	m3	0.150	34.56	5	
Lining	m2	1.714	8.75	15	
Others	L.S			5	
Transportation	L.S			5	
Total				36	
Earth Lining Canal Type S7 (Q=30 ~ 60 l/s)					
Description	Unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	0.140	30.61	4	
Embankment	m3	0.120	34.56	4	
Lining	m2	1.431	8.75	13	
Others	L.S			4	
Transportation	L.S			4	
Total				29	
Earth Lining Canal Type S8 (Q=105 ~ 210 l/s)					
Description	Unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	0.315	30.61	10	
Embankment	m3	0.210	34.56	7	
Lining	m2	2.180	8.75	19	
Others	L.S			7	
Transportation	L.S			6	
Total				50	
Earth Lining Canal Type S9 (Q=24 ~ 48 l/s)					
Description	Unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	0.120	30.61	4	
Embankment	m3	0.120	34.56	4	
Lining	m2	1.331	8.75	12	
Others	L.S			4	
Transportation	L.S			4	
Total				27	
Earth Lining Canal Type S10 (Q=15 ~ 30 l/s)					
Description	Unit	Quantity	Unit Price	Amount	Remark
Excavation	m3	0.105	30.61	3	
Embankment	m3	0.090	34.56	3	
Lining	m2	1.249	8.75	11	
Others	L.S			3	
Transportation	L.S			3	
Total				24	