

Work Program · Work Volume: NCP

1/2

Category Distinguish Items	Unit	Irrigation						Road			Bridge			Culvert			Total				
		Canal		Small dam (tank)			Well for irriga- tion	New con- struc- tion	Repair, Improvement, Extension			New construction			Work volume / Year						
		New construc- tion	Rehabili- tation	Small	Medium	Large			Repair	Improve- ment	Exter- sion	Small	Me- dium	Large	Small	Me- dium	Large	Subtotal	Total		
		Small	Medium	Small	Medium	Large	0 km	2.6 km	23.3 km	2	0	0	0	0	0	0	0	0	0		
Scale of program		0	0	2	15	11	15	0 km	2.6 km	23.3 km	2	0	0	0	0	0	0	0	0	134,500	
Roadbed formation	m <sup>2</sup>																				134,500
Banking	m <sup>3</sup>							0	9,360	83,880										93,240	93,240
Loading, Transportation (Road)	m <sup>3</sup>						132,000													13,200	13,200
Land clearing, Land reclamation	m <sup>2</sup>																			0	334,600
Excavation	m <sup>3</sup>	0	0	0			112.5	0			24	0	0	0	0	0	0	0	0	136	136
Transportation · Loading	m <sup>3</sup>			240	5,400															5,640	5,640
Compaction : 6 times	m <sup>2</sup>							0		139,800										139,800	139,800
: 4 times	m <sup>2</sup>								7,800											7,800	142,400
: 2 times	m <sup>2</sup>	0	0	800	18,000	44,000					8	0	0	0	0	0	0	0	23,208	23,208	23,208
Pavement	m <sup>2</sup>							0	5,200	93,200										98,400	98,400
Transportation	m <sup>3</sup>							0	9,360 × 20%	83,880 × 50%										43,812	43,812

Work Program · Work Volume: NCP

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Category Distinguishing Items	Potable water						Agriculture						Public facilities						Training		Subtotal  Work volume/ Year									
	Unit	New construction			Improvement · Repair			Water supply (Piping)			Field develop- ment, Mainte- nance (Paddy, Vegetable)			Plantation (Tea, Coconut)			School, Hospital, Community center, Bus terminal, etc.			Land preparation (Public facilities)			Manson, Wood work, Maintenance							
		Deep	Shal- low		Deep	Shal- low		Small	Me- dium	Large	Small	Me- dium	Large	Small	Me- dium	Large	Small	Me- dium	Small	Me- dium		Small	Me- dium							
Scale of program																														
Number of program		0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0			
Roadbed formation	m <sup>2</sup>																2,250	5,200	117,150	10,000	10,000								134,600	
Banking	m <sup>3</sup>																													0
Loading, Transportation (Road)	m <sup>3</sup>																													0
Land clearing, Land reclamation	m <sup>2</sup>									0	0	0	0	0	0	200 ×10 <sup>3</sup>	0	5,200	117,150	10,000	10,000									334,600
Excavation	m <sup>3</sup>	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transportation · Loading	m <sup>3</sup>																													0
Compaction : 4 times	m <sup>2</sup>																													0
: 2 times	m <sup>2</sup>																2,250	5,200	117,150	10,000	10,000									134,600
: 1 time	m <sup>2</sup>																													0
Pavement	m <sup>2</sup>																													0
Transportation	m <sup>3</sup>																													0

Work Program - Work Volume: UVA

Category Distinguish Items	Unit	Irrigation						Road				Bridge			Culvert			Total		
		Canal		Small dam (tank)			Well for irrigation	New construction	Repair, Improvement, Extension		New construction		Small	Medium	Large	Small	Medium	Large	Subtotal	Total
		New construction	Retabilitation	Small	Medium	Large			Repair	Improvement	Extension	Small								
Scale of program		1	0	7	5	37	3	53.0 km	7.6 km	2.7 km	1.7 km	0	0	0	0	0	4			
Number of program																				
Roadbed formation	m <sup>2</sup>																	0	235,850	
Banking	m <sup>3</sup>							190,800	9,720	6,120								206,640	206,640	
Loading, Transportation (Road)	m <sup>3</sup>					44,400												44,400	44,400	
Land clearing, Land reclamation	m <sup>2</sup>																	0	335,850	
Excavation	m <sup>3</sup>	90	0				22.5											124.14	150	
Transportation - Loading	m <sup>3</sup>			840	1,800			318,000										2,651	2,687	
Compaction : 6 times	m <sup>2</sup>								45,600	8,100	10,200							318,000	323,000	
: 4 times	m <sup>2</sup>																	63,900	294,750	
: 2 times	m <sup>2</sup>	12,000	0	2,800		148,000												162,810	162,990	
Pavement	m <sup>2</sup>							212,000	5,400	6,800								224,200	224,200	
Transportation	m <sup>3</sup>							190,800 X 50%	9,720 X 20%	6,120 X 50%								100,404	100,404	

Work Program - Work Volume: UVA

Category Distinguishing Items	Unit	Potable water										Agriculture						Public facilities						Training			Subtotal Work volume/ Year
		Well			Improvement - Repair			Water supply (Piping)				Field develop- ment, Mainte- nance (Paddy, Vegetable)		Plantation (Tea, Coconut)		School, Hospital, Community center, Bus terminal, etc.			Land preparation (Public facilities)			Manson, Wood work, Maintenance					
		New construction		Shal- low	Deep	Shal- low	Deep	Shal- low	Deep	Small	Me- dium	Large	Small	Me- dium	Large	Small	Me- dium	Large	Small	Me- dium	Large	Small	Me- dium	Large	Small	Me- dium	
		Deep	Shal- low	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Scale of program		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of program																											
Roadbed formation	m <sup>2</sup>																										
Banking	m <sup>3</sup>																										
Loading, Transportation (Road)	m <sup>3</sup>																										
Land clearing, Land reclamation	m <sup>2</sup>																										
Excavation	m <sup>3</sup>																										
Transportation - Loading	m <sup>3</sup>																										
Compaction : 4 times	m <sup>2</sup>																										
: 2 times	m <sup>2</sup>																										
: 1 time	m <sup>2</sup>																										
Pavement	m <sup>2</sup>																										
Transportation	m <sup>3</sup>																										

Work Program - Work Volume: SAB

1/2

Category Distinguish Items	Unit	Irrigation						Road			Bridge			Culvert			Total	
		Canal		Small dam (tank)			Well for irriga- tion	New con- struc- tion	Repair Improvement, Extension		New construction		New construction		New construction		Subtotal	Total
		New construc- tion	Rehabili- tation	Small	Medium	Large			Small	Medium	Small	Medium	Small	Medium	Small	Medium		
Scale of program		0	1	10	6	1	0	0 km	19.0 km	6.4 km	23.5 km	5	1	3	6	1		
Number of program																		
Roadbed formation	m <sup>2</sup>																0	126,350
Banking	m <sup>3</sup>							0		23,040	84,600						107,640	107,640
Loading, Transportation (Road)	m <sup>3</sup>					1,200											1,200	1,200
Land clearing, Land reclamation	m <sup>2</sup>																0	1,231,300
Excavation	m <sup>3</sup>	0	480				0					60	12	0.63	5.16	2.91	560	736
Transportation - Loading	m <sup>3</sup>			1,200	2,160								12	0.63	5.16	2.91	3,380	3,425
Compaction : 6 times	m <sup>2</sup>							0			141,000						141,000	146,000
: 4 times	m <sup>2</sup>							144,000									114,000	240,300
: 2 times	m <sup>2</sup>	0	24,000	4,000	7,200	4,000						20	4	1.8	7.2	2.7	39,235	39,400
Pavement	m <sup>2</sup>							0			94,000						94,000	94,000
Transportation	m <sup>3</sup>									23,040 ×20%	84,600 ×50%						46,908	46,908

Work Program - Work Volume: SAB

Category Distinguish Items	Unit	Potable water						Agriculture						Public facilities						Training		Subtotal Work volume/ Year					
		Well			Shal-low			New construction		Improvement Repair		Water supply (Piping)			Field develop- ment, Mainte- nance (Paddy, Vegetable)		Plantation (Tea, Coconut)		School, Hospital, Community center, Bus terminal, etc.				Land preparation (Public facilities)			Manson, Wood work, Maintenance	
		Deep	Shal- low	Shal- low	Deep	Shal- low	Shal- low	Small	Me- dium	Large	Small	Me- dium	Vegetable	Small	Me- dium	Small	Me- dium	Small	Me- dium	Large	Small		Me- dium	Small	Me- dium	Small	Me- dium
		1	10	3	0	3	1	5	0	0	2	4	1	0	0	9	9	11	0	1	0		0	9	9	1	0
Scale of program																											
Number of program																											
Roadbed formation	m <sup>2</sup>																										126,350
Banking	m <sup>3</sup>																										0
Loading, Transportation (Road)	m <sup>3</sup>																										0
Land clearing, Land reclamation	m <sup>2</sup>																										1,231,300
Excavation	m <sup>3</sup>																										176
Transportation - Loading	m <sup>3</sup>																										45
Compaction : 4 times	m <sup>2</sup>																										5,000
: 2 times	m <sup>2</sup>																										126,350
: 1 time	m <sup>2</sup>																										165
Pavement	m <sup>2</sup>																										0
Transportation	m <sup>3</sup>																										0

Name of equipment	Specifications	Works	Working capacity per equipment		Conditions
			per day	per year	
Motor grader	Horsepower : 110 ~ 120 HP Blade width : 3.0 ~ 3.15 m Scratching width of scarifier : 1.06 ~ 1.1 m	Scratching	5,088 m <sup>2</sup>	1,017 × 10 <sup>3</sup> m <sup>2</sup>	Effective width of scarifier : 1.06 m Working speed : 2,000 m/h Scratching : 2 times Working efficiency : 60% Working hours : 8 hours per day days : 200 days per year
		Layering	4,147 m <sup>2</sup>	829 × 10 <sup>3</sup> m <sup>2</sup>	Effective blade width : 2.4 m Working speed : 1,800 m/h Layering : 5 times Working efficiency : 50% Working hours : 8 hours per day days : 200 days per year
		Banking	3,800 m <sup>3</sup>	760 × 10 <sup>3</sup> m <sup>3</sup>	Effective blade width : 2.2 m Blade depth : 0.2 m Working speed : 1,800 m/h Working efficiency : 60%
Bulldozer	Horsepower : 90 ~ 95 HP Weight : 10 ~ 11 ton Blade (L×H) : 2.6 × 1.0 m Excavation depth : 0.4 m	Loading and transportation	960 m <sup>3</sup>	192 × 10 <sup>3</sup> m <sup>3</sup>	Loading and transportation distance : 20 m Work volume : 120 m <sup>3</sup> /h Working hours : 8 hours per day days : 200 days per year (Data quoted from Japan Construction Equipment Hand Book)
		Land leveling (Land formation)	1.1 × 10 <sup>3</sup> m <sup>2</sup>	2,200 × 10 <sup>3</sup> m <sup>2</sup>	Working speed : 1.0 km/h Excavation depth : 0.2 m Working efficiency : 70% Working hours : 8 hours per day days : 200 days per year
		(Land reclamation)	1.45 × 10 <sup>3</sup> m <sup>2</sup>	2,900 × 10 <sup>3</sup> m <sup>2</sup>	

Name of equipment	Specifications	Works	Working capacity per equipment		Conditions
			per day	per year	
Front loader with backhoe	Horsepower : 55 ~ 60 HP 4 wheel farm tractor type Front loader : 0.6 m <sup>3</sup> Backhoe : 0.064 m <sup>3</sup>	Excavation for basement (Drainage work)	9.2 m <sup>3</sup>	1.84 × 10 <sup>3</sup> m <sup>3</sup>	Excavation width : 0.45 m Cycle time : 16 ~ 26 secs (average : 20 secs) Working efficiency : 80% Working hours : 8 hours per day days : 200 days per year
		Transportation and loading	142 m <sup>3</sup>	28.4 × 10 <sup>3</sup> m <sup>3</sup>	Transportation speed : 170 m/min Return speed to site : 330 m/min Fixed time : 1 min Transportation distance : 50 m Bucket loading efficiency : 90% Working hours : 8 hours per day days : 200 days per year
Road roller	Horsepower : 55 ~ 60 HP Rolling width : 2 m Speed : 2.5 ~ 10.0 km/h	Compaction Road bed to be constructed Expansion and improvement Athletic field Community centre Finishing	2,200 m <sup>2</sup>	440 × 10 <sup>3</sup> m <sup>2</sup>	Working efficiency : 65% Compaction required : Foundation ..... 6 times Ground face ..... 4 times Finishing ..... 2 times Working hours : 8 hours per day days : 200 days per year Working speed : 2.5 km/h
			3,250 m <sup>2</sup>	650 × 10 <sup>3</sup> m <sup>2</sup>	
			3,250 m <sup>2</sup>	650 × 10 <sup>3</sup> m <sup>2</sup>	
			6,500 m <sup>2</sup>	1,300 × 10 <sup>3</sup> m <sup>2</sup>	
Hand guide roller	Horsepower : 4.5 ~ 5.5 HP Rolling width : 570 m Speed : 0 ~ 3.5 km/h	Compaction	1,600 m <sup>2</sup>	320 × 10 <sup>3</sup> m <sup>2</sup>	Working efficiency : 70% Roller width : 570 mm Compaction required : 4 times Working speed : 2 km/h Working hours : 8 hours per day days : 200 days per year



Work programs, Work volume, Standard work volume for estimation

Appendix: A-7

Project category	Irrigation Canal		Cost (Rs = 1,000)	Work programs number or work volume (Distance of Road works)	WP	CP	SP	NWP	NCF	UVA	SAB
	Items	Scale									
Irrigation	Irrigation Canal (Construction)	Small	35	Excavation 270m <sup>3</sup> (In case of rehabilitation 90m <sup>3</sup> ) Compaction (Width 4m) = 12,000m <sup>2</sup>	6	5	3	0	0	1	0
		Medium	180	Excavation 440m <sup>3</sup> (In case of rehabilitation 480m <sup>3</sup> ) Compaction (Width 4m) = 24,000m <sup>2</sup>	2	4	1	0	0	0	0
		Small	20	10% Earthwork	8	12	8	6	2	2	7
Irrigation Dam for Irrigation	Irrigation Tank	Medium	65	Banking: 360m <sup>3</sup> , Compaction: 1,200 m <sup>2</sup>	9	15	1	22	15	5	6
		Large	210	Banking: 1,200m <sup>3</sup> , Compaction: 4,000 m <sup>2</sup> Placing concrete, 20m <sup>3</sup> , Dredging: 400m <sup>3</sup>							
			330	Excavation: 75m <sup>3</sup> (machine), 82m <sup>3</sup> (manpower)	1	0	0	19	15	3	0
Road	Construction		210/km	Roadbed: 0.6m, Road width: 6m, Bankin earth volume: 3.6m <sup>3</sup> /m, Pavement width: 4m	3.7 km	24.3 km	13.2 km	28.6 km	0 km	53.0 km	0 km
		Minor repair	5/km	C, D and E grade	26.0 km	34.6 km	28.4 km	3.0 km	0 km	7.6 km	19.0 km
		Repair, Improvement	15/km	C, D and E grade	26.2 km	9.1 km	9.0 km	1.7 km	2.6 km	2.7 km	6.4 km
Bridge	Construction	Extension	160/km	Repair of all road surface leveling for 50% area of total area	4.8 km	12.6 km	19.8 km	4.8 km	23.3 km	1.7 km	23.5 km
		Small	60	C, D and E grade	0	4	6	4	2	0	5
		Medium	250	2x2m Stone masonry pier	2	1	1	2	0	0	1
Culvert	Construction	Small	15	Excavation: 0.21 m <sup>3</sup> , Compaction: 0.6 m <sup>2</sup>	6	3	29	0	0	0	3
		Medium	60	Excavation: 0.86 m <sup>3</sup> , Compaction: 1.2 m <sup>2</sup>	1	2	2	1	0	0	6
		Large	220	Excavation: 2.91 m <sup>3</sup> , Compaction: 2.7 m <sup>2</sup>	0	1	1	0	0	4	1
Drinking Water	Well	Deep well	580/1	(Boring machine use)	1	0	0	1	0	1	1
		Shallow well	30/1	Boring depth: 150~170m	18	32	11	1	0	0	10
		Deep well	160/1	Excavation: 12 m <sup>3</sup> (machine), 13 m <sup>3</sup> (manpower)	0	0	1	1	0	0	0
Agriculture	Water works (Water pipe)	Shallow well	15/1	(Boring machine use)	7	26	3	4	0	0	3
		Small	20/1 Prog.	Excavation: 2.6 m <sup>3</sup> (manpower)	2	3	3	0	0	0	1
		Medium	70/1	Excavation: 4.5 m <sup>3</sup>	0	2	3	0	0	2	5
Public facilities	Agricultural Development (Paddy field, Upland field)	Large	210/1	Excavation: 9.0 m <sup>3</sup>	1	3	2	0	0	2	0
		Large	1,241	Appurtenant facilities: Shallow well, Pump	0	12	6	6	0	0	4
		Small	40	100 m <sup>3</sup> /ha	0	0	1	2	0	0	2
Vocational Education	Model farm development (Plantation) Coconut, Tea	Large	30	50 m <sup>3</sup> /ha	2	0	15	8	2	1	1
		Small	175	100x103 m <sup>2</sup>	0	2	1	0	0	0	0
		Small	40	300x103 m <sup>2</sup>	29	32	35	22	15	9	22
Public facilities	School, Hospital, Bus Terminal, Community center	Medium	130	150m <sup>2</sup> (Land area)	13	9	4	23	8	9	9
		Large	360	650m <sup>2</sup> (Land area), Hospital etc.	17	20	6	8	11	21	11
		Small	30	650m <sup>2</sup> (Land area), Play ground: 10,000m <sup>2</sup> (School)	0	1	9	4	1	0	0
Vocational Education	Land improvement, Play ground	Medium	120	Loading, Transportation (Depth: 20 cm)	0	4	3	1	0	1	1
		Small	20	Loading, Transportation (Depth: 20 cm), 5,000 m <sup>2</sup>	3	10	3	14	0	4	1
		Medium	70	50 House: per (9x9m)	3	2	0	0	0	0	0

MAINTENANCE AND MANAGEMENT OF EQUIPMENT AT WORKSHOP

1. GENERAL

For proceeding to maintain and operate, the direct and indirect cost of following operation and maintenance have been boren:

- (1) Facility : Investigation, Maintenance, Management and Depreciation amount.
- (2) Equipment: Purchase, Maintenance, Management and Depreciation amount.
- (3) Staff : Personnel expenses

In this clause, the second item of above item will be study as view of operation and maintenance.

According to the deprecation or going to proceed the project. This project has been except its cost.

2. MAINTENANCE · CONTROL

The equipment might be maintain in normal condition for proceeding to make a plan and implement the project.

Therefore the machine might be operated by operation and maintenance daily notebook. But even these condition, it is no matter what unexpected trouble will be happened or not.

Under this condition, O/M is categorized under following item.

2.1. Daily check and maintenance

As a daily work. This work is maintenance after operation of machine as usually cleaning, greasing and checking in daily (For example: Oil level, cooling water level and belt tension)

## 2.2. Periodically check and maintenance

The machine might be check and maintenance in periodically as 200 and 600 hours.

- Periodically check and change: Air-cleaner, Oil filter, etc.
- Check, adjust and file in Oil : Fan-belt, Lubrication oil (Brake, transmission, etc.)

## 2.3. Repair

If the machine will be happened a trouble in operating because of some reason, the machine might be repair after causing the reason of trouble.

## 2.4. Maintenance of spare parts

Necessary and suitable parts might be stock and control for proceeding the above mentioned maintenance and repair smoothly.

## 3. O/M COST

O/M cost are estimated as following condition as implementation of project:

### 3.1. Stock of parts

Necessary parts of quantity and kind for repair and maintenance are recommended by percentage of machine cost based on CIF price in one of indicator for estimating quantity. But this indicator figures are influenced under the operation condition of working, climate and soil, etc.

Expenditure of O/M charge of equipment (%)

			Expenditure (CIF×%)		
			1st years operation	2nd years operation	3rd years operation
Con- struc- tion machine	Heavy	Motor Grader, Bull dozer, Road roller, Back-hoe	10%	15 ~ 20%	25 ~ 30%
	Light machine	Hand guide roller, Generator, Concrete mixer	10%	10 ~ 15%	20 ~ 25%
	Others	Asphalt kettle, Welder, Crusher, Pocker-vibrator, Air compressor, Braker, Rock drill	0%	5 ~ 10%	10 ~ 15%
Vehicle	Heavy vehicle	Dump truck, Truck trailer, Cargo truck	10%	15 ~ 20%	25 ~ 30%
	Light vehicle	Pick-up truck, Motor cycle	10%	10 ~ 15%	20 ~ 25%
Agri- cultural machine	Heavy machine	4 wheel tractor	10%	15 ~ 20%	25 ~ 30%
	Light machine	2 wheel tractor, Pump, Trailer, Trailer bowser	0 ~ 10%	10 ~ 15%	20 ~ 25%
Other equipment		Wood work tool, Manson's tool, Maintenance tool, Fax. machine, Duplicator with scanner, Survey equipment	0%	5 ~ 10%	10 ~ 15%

[ Operation condition ]

① Operating hours and day: 8 hours/day, 200 days/year

Relevant parts are itemized as following.

	Main recommended parts
1st year operation	Standards belt and nut, Packing, O-ring, Oil seal filter, Electric parts (Bulb, Fuse, Pilot lamp), Piping (Lub, Oil, Fuel oil pipe), Weaved parts (Nozzle, tire, Tine)
2nd year operation	Special bolts and Nuts, Spring, Brake shoe, Truck section (Shoe, Wheel disc), Fuel section (Nozzle, Valve), Electric section (Plug, Wire harness), Bearing (Belt bearing, Metal), Bonnet and cover, Filer (Engine, Transmission)
3rd year operation	Engine (Piston ring, Cylinder, Crank metal), Electric section (Starting motor, Brush, Armature, Starter switch, Battery) Coupling, Casing, Gear, Bearing, Other special parts

Total amount of stock for each province are estimated as following based on above list. (Unit: CIF RS)

(Unit: RS 1,000)

	W.P	C.P	S.P	N.W.P	N.C.P	UVA.P	SABA.P
1st year operation	4,463	4,814	3,414	2,960	2,960	4,577	1,636
2nd year operation	10,108	10,720	7,907	7,210	7,210	9,300	2,954
3rd year operation	15,241	16,123	11,904	10,895	10,895	14,030	4,591

According to the O/M cost for each division, these cast of parts of 14 items as from pick-up truck to survey equipment are estimated as following.

1st years operation	RS 218,000.-
2nd year operation	RS 447,000.-
3rd year operation	RS 696,000.-

### 3.2. Change of Lubrication oil

Lubrication oil is most important to reduce friction and cooling between rotating parts and hearing.

Selecting a lubricant of good quality is more useful to keep a maintenance and good condition of machine. Therefore oil might be changed periodically, and necessary cost of changing oil are estimated as follow:

Engine : RS 47/ℓ  
 T/M and Hydraulic oil : RS 54/ℓ (Sep. 1991, Colombo)

	Material	Oil Q'ty	Amount (RS)
Motor grader	Engine oil	9 ℓ	423
	T/M and Hydraulic oil	145 ℓ	7,830
			8,253
Bull dozer	Engine oil	15 ℓ	705
	T/M and Hydraulic oil	335 ℓ	18,090
			18,795
Damp truck	Engine oil	15 ℓ	705
	T/M and Hydraulic oil	340 ℓ	18,360
			19,065
Cargo truck	Engine oil	15 ℓ	705
	T/M and Hydraulic oil	140 ℓ	7,560
			8,265
Pick-up truck	Engine oil	12 ℓ	564
	T/M and Hydraulic oil	50 ℓ	2,700
			3,264
Wheel loader	Engine oil	15 ℓ	705
	T/M and Hydraulic oil	204 ℓ	11,016
			11,721
Road roller	Engine oil	11 ℓ	517
	T/M and Hydraulic oil	40 ℓ	2,160
			2,677
Vibration roller	Engine oil	2.4 ℓ	112
	T/M and Hydraulic oil	14.6 ℓ	788
			900
Tractor (80 HP)	Engine oil	15 ℓ	705
	T/M and Hydraulic oil	49 ℓ	2,646
			3,351
Tractor (45 HP)	Engine oil	12 ℓ	564
	T/M and Hydraulic oil	49 ℓ	2,646
			3,210

Usually, above mentioned oil might be changed as following condition:

- ◎ Construction machine, Agricultural machine and Office equipment:  
600 hours or One year
- ◎ Vehicle: 3,000 hours or One year

O/M cost of required equipment for lubrication oil will be estimated as follow.

- ① Province : 90,000~100,000 RS/year
- ② Division : 10,000 RS/year

### 3.3. Fuel Oil Cost

Fuel consumption of engine is different by size of horse power and engine. In this project, Equipments are mounted on diesel engine as reason of economically excepted some equipments mounted on gasoline engine.

Quantity of fuel consumption is estimated as follow based on under mentioned condition.

- ① Operating time: 8 hours/day × 200 days/year = 1,600 hours
- ② Working volume of horse power

« Province »

(A) 60HP ~ 240HP: Fuel consumption	170 g/HP/hr
Bull dozer	90 HP
Damp truck	180 HP
Cargo truck	160 HP
Back hoe	60 HP
Road roller	60 HP
Low bed trailer	240 HP
Pick-up truck	70 HP
<b>Total</b>	<b>860 HP</b>

※ Fuel volume of 860 HP (Specific gravity of heavy oil = 0.84)  
 $= 860H \times 170 \text{ g/HP/hr} \times 200 \text{ hr} \div 0.84 \div 1,000$   
 $\approx 34,800\ell$

(B) Not more than 60 HP: Fuel consumption 210 g/HP/hr

Air compressor	35 HP
Asphalt kettle	3 HP
Hand guide roller	5 HP
Concrete mixer	5 HP
Generator	30 HP
<hr/>	
Total	78 HP

※ Fuel volume of 78 HP  
 $= 78 \times 210 \text{ g/HP/hr} \times 200 \text{ hr} \div 0.84 \div 1,000$   
 $\approx 3,900\ell$

◎ Fuel consumption volume as province  
 $= (A) + (B) = 38,700\ell$

◎ Fuel cost as province = RS ~~434,500~~ <sup>425,700</sup>  
 Market cost of heavy oil = RS 11.00/ℓ

◀ Division ▶

(A) Not less than 60 HP:

Pick-up truck	70 HP
---------------	-------

※ Fuel consumption volume  
 $= 70 \times 170 \text{ g/HP/hr} \times 200 \text{ hr} \div 0.84 \div 1,000$   
 $\approx 2,800\ell$



(B) Less than 60 HP:

Farm tractor	47 HP
2 wheel tractor	9 HP
Pump	3 HP
Diesel generator	20 HP
Total	79 HP

$$\begin{aligned} & \times \text{ Fuel consumption volume} \\ & = 79 \times 210 \text{ g/HP/hr} \times 200 \text{ hr} \div 0.84 \div 1,000 \\ & \doteq 4,000\ell \end{aligned}$$

$$\textcircled{c} \text{ Fuel consumption volume as annually at Division level} \\ = (A) + (B) = 6,800\ell$$

$$\textcircled{c} \text{ Fuel cost per annually at Division level} = \text{RS } 74,800$$

#### 3.4. Conclusion of O/M Cost

Total O/M costs are summed to the following table on each province and Division based on the preceding clause : 3-1, 3-2 and 3-3.

« Provision level »

	Max.	Min.	Average
1st year operation	¥ 6,912,000 (RS 1,728,000)	¥ 3,734,000 (RS 933,500)	¥ 5,323,000 (RS 1,330,000)
2nd year operation	¥ 12,818,000 (RS 3,204,500)	¥ 5,052,000 (RS 1,263,000)	¥ 8,935,000 (RS 2,233,000)
3rd year operation	¥ 18,221,000 (RS 4,555,000)	¥ 6,689,000 (RS 1,672,000)	¥ 12,455,000 (RS 3,113,000)

« Division level »

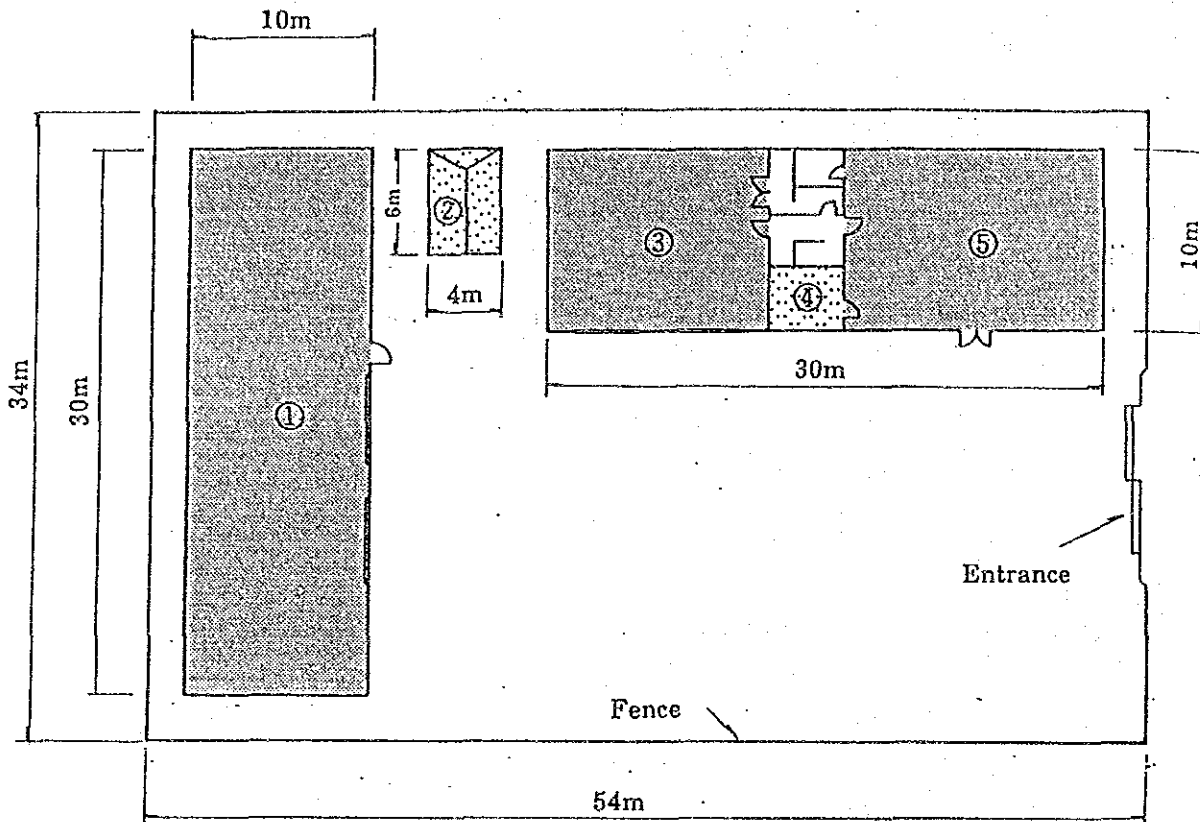
Average: 1st year	¥ 1,211,000 (RS 302,000)
2nd year	¥ 2,127,000 (RS 531,000)
3rd year	¥ 3,125,000 (RS 781,000)

Above O/M costs are not including a depreciation amount at equipment and personal charge for operator. For reference, the general operators wage in Sri Lanka are as following and the wage are no wage disparity between operator of bulldozer, excavator and motor grader, etc.

- Public    · Wage/Month : RS 2,500  
          · Over time    :  $2,500 \div 240 \times 1.5 \approx$  RS 15/Hour
- Private   · Wage/Month : RS 1,000 ~ 1,200/Hour  
          · Over time    : RS 10 ~ 20/Hour

(Source: ICTAD Sep. 24, 1991)

Appendix : A-9 Typical Workshop Layout Drawing for Divisional Office



- ① -- Warehouse
- ② -- Car Wash
- ③ -- Maintenance Shop
- ④ -- Parts Depot
- ⑤ -- Office

## Appendix : A-10 Specifications of Equipment

### A: Specifications of the Equipment for Provinces

#### A-1. Motor Grader

1. Blade's width : 3.0 ~ 3.2m
2. Dimensions (mm):
  - ① Overall length : 6,700 ~ 7,000
  - ② Overall width : 2,000 ~ 2,300
  - ③ Overall height : 2,700 ~ 3,000
  - ④ Wheel base : 4,800 ~ 5,100
3. Engine :
  - ① Type : 4 cycle, Water cooled diesel engine
  - ② Output (At fly wheel, SAE) : 110 ~ 120 HP
  - ③ Fuel oil tank capacity : 200 ~ 250ℓ
4. Transmission :
  - ① Travel speed : Max. : 46 ~ 51 km/h  
Min. : 3 ~ 4 km/h
  - ② Shift : Forward : 5 ~ 8  
Reverse : 5 ~ 8
  - ③ Type : Hydraulic or Power shift
5. Brake :
  - ① Service brake : Disk brake driven by air force or Hydraulic force
  - ② Parking brake : Wet type disc brake
6. Scarifier :
  - ① Digging width : 1,000 ~ 1,100 mm
7. Tire size :
  - ① Front wheel : 10.00 - 20 - 10 PR or equivalent
  - ② Rear wheel : 11.00 - 20 - 10 PR or equivalent

## A-2. Bulldozer

1. Operating weight (Without attachment and canopy) : 5,300 ~ 6,300 kg

2. Engine :

- ① Type : 4 cycle, Water cooled diesel engine
- ② Output (At fly wheel) : 80 ~ 90 HP
- ③ Fuel oil tank capacity : 110 ~ 120ℓ

3. Dimensions (mm) :

- ① Overall length : 2,900 ~ 3,100
- ② Overall width : 1,600 ~ 1,900
- ③ Overall height : 1,800 ~ 2,100

4. Transmission :

- ① Travel speed : Forward : Max.: 6.5 ~ 8.5 km/h  
Min.: 2.0 ~ 3.0 km/h  
Reverse : Max.: 6.5 ~ 8.5 km/h  
Min.: 2.0 ~ 3.0 km/h
- ② Shift : Forward : 3 ~ 4  
Reverse : 3 ~ 4

5. Blade :

- ① Type : Power angle, tilt dozer type
- ② Width : 3.1 ~ 3.2m

6. Accessories :

- ① Ripper : 1 set
- ② ROPS canopy : 1 set

A-3. Tipper truck (Dump truck)

1. Max. payload : 6 ~ 8 ton
2. Construction of chassis : Steel
3. Dimensions (mm) :
  - ① Overall length : 6,200 ~ 6,900
  - ② Overall width : 2,400 ~ 2,500
  - ③ Overall height : 2,400 ~ 2,800
  - ④ Wheel base : 3,600 ~ 3,900
4. Performance :
  - ① Min. turning radius : 6.4 ~ 6.6 m
  - ② Gradeability ( $\tan \theta$ ) : 0.283 ~ 0.46
5. Engine :
  - ① Type : 4 cycle, Direct injection, Water cooled diesel engine
  - ② Output (Gross output/SAE) : 160 ~ 180 HP
  - ③ Fuel oil tank capacity : 125 ~ 135ℓ
6. Transmission :
  - ① Travel speed : Max. : 80 ~ 100 km/h
  - ② Shift : Forward : 5 ~ 6  
Reverse : 1
  - ③ Type : Synchromesh and constant mesh
7. Brake :
  - ① Service brake : Hydraulic drum brake
  - ② Parking brake : Mechanical operated by hand brake acting on drum at rear of transmission
8. Clutch : Dry, Single disc clutch
9. Tire size : Front wheel : 9.00 - 20 - 14 PR ~ 11.1 - 20 - 16 PR  
Rear wheel : 9.00 - 20 - 14 PR ~ 11.1 - 20 - 16 PR
10. Steering wheel :
  - ① Position : Right
11. Accessories :
  - ① Air condition (or cooler) : 1 set
  - ② Radio : AM
  - ③ Driver seat belt : 1 set
  - ④ Tool : 1 set

#### A-4. Cargo truck

1. Type : Flat type, cargo truck
2. Payload : 5,000 kg
3. Dimensions (mm):
  - ① Overall length : 7,000 ~ 8,000
  - ② Overall width : 2,000 ~ 2,500
  - ③ Overall height : 2,300 ~ 2,500
  - ④ Wheel base : 4,100 ~ 4,300
4. Performance :
  - ① Min. turning radius : 6.7 ~ 6.9 m
  - ② Gradeability ( $\tan \theta$ ) : 0.35 ~ 0.42
5. Engine :
  - ① Type : 4 cycle, Water cooled diesel engine
  - ② Output (Rating output) : 150 ~ 170 HP
  - ③ Fuel oil tank capacity : 90 ~ 120ℓ
6. Transmission :
  - ① Travel speed : Max. : 80 ~ 100 km/h
  - ② Shift : Forward : 5 ~ 6  
Reverse : 1
  - ③ Type : Constant and synchro mesh
7. Brake :
  - ① Service brake : Hydraulic type (Assist by vacuum)
  - ② Parking brake : Mechanical, internal expanding type
8. Steering :
  - ① Type : Ball type
  - ② Position : Right handle
9. Tire size : 8.25 - 20 - 4 PR or equivalent
10. Accessories :
  - ① Tool : 1 set
  - ② Air condition (cooler) : 1 set
  - ③ Seat belt : 1 set

A-5. Wheel loader with back-hoe

1. Type : Wheel loader with back-hoe
2. Bucket capacity :
  - ① Front loader : 0.6 ~ 1.0 m<sup>3</sup>
  - ② Back-hoe : 0.05 ~ 0.1 m<sup>3</sup>
3. Dimension (without back-hoe)
  - ① Overall length : 4,900 ~ 5,400
  - ② Overall width : 1,700 ~ 2,100
  - ③ Overall height : 2,700 ~ 3,100
  - ④ Wheel base : 2,200 ~ 2,500
4. Min. turning radius = Full turn
5. Engine :
  - ① Type : 4 cycle, Water cooled diesel engine
  - ② Output (At fly wheel) : 55 ~ 60 HP
  - ③ Fuel oil tank capacity : 65 ~ 75ℓ
6. Transmission :
  - ① Travel speed : Max. : Forward : 32 ~ 34 km/h  
Reverse : 13 ~ 32 km/h
  - ② Shift : Forward : 3  
Reverse : 1 ~ 3
  - ③ Type : Power shift or hydraulic transmission
7. Tire size : 17.5 - 20 - 10 PR or equivalent
8. Steering : Hydraulic type, power assist
9. Brake :
  - ① Service brake : Wet type, disc brake
  - ② Parking brake : Dry type, disc brake



A-6. Air compressor

1. Actual free air delivery : 100 ~ 130 cfm
2. Operating pressure : 7.0 kg-t/cm<sup>2</sup> (100 psi)
3. Engine:
  - ① Type : Water cooled or Air cooled diesel engine
  - ② Output (Cont. rating output) : 35 ~ 40 HP
4. Air service cock :
  - ① Size : PT 3/4"
  - ② Number of valves : 2 ~ 3

A-7. Braker

1. Type : Air - pressure type, hand braker
2. Dry weight : Approx. 20 kg
3. Cylinder diameter for piston : Approx. 38 mm
4. Air pressure: 6.0 kg/cm<sup>2</sup> (85 psi)
5. Accessories :
  - ① Braker : 1 pce.
  - ② Air hose : Approx. : 15 m, 1 pce.

A-8. Rock drill

1. Type : Air - pressure type, hand rock drill
2. Dry weight : Approx. 11.5 kg
3. Cylinder diameter for piston : Approx. 50 mm
4. Air consumption : Approx. 0.8 m<sup>3</sup>/min. (At 5 kg/cm<sup>2</sup>)

5. Accessories :

- ① Air hose : 1 set

A-9. Portable crusher

1. Type : Jaw crusher, mounted on trailer

2. Jaw crusher :

- ① Feed opening (W×L) : Approx. 16"×10"  
② Revolution : 250 ~ 350 RPM  
③ Driving system : Driven by V-belt  
④ Accessories : Feed hopper, Safety cover

3. Separating section :

- ① Screen size (W×L) : Approx. 500 mm × 1,800 mm  
② Mesh : 40, 20 & 5 mm  
③ Driving system : Driven by V-belt

4. Engine :

- ① Type : Water cooled or Air cooled diesel engine  
② Output (cont. rating output) : 45 ~ 55 HP

5. Trailer :

- ① Material : Steel  
② Tire size : 7.50 - 15 - 10 PR or equivalent  
③ Drawing type : Draw - bar type

A-10. Asphalt Kettle

1. Asphalt Kettle :

- ① Type : Direct heating  
② Capacity : Approx.: 200ℓ  
③ Accessories: Thermometer

2. Spray pump :

- ① Type : Gear pump
- ② Pump capacity : Approx. : 50 ℓ/min.
- ③ Spraying capacity : 20 ~ 30 ℓ/min.

3. Burner :

- ① Type : Vaporization type oil burner
- ② Fuel : Kerosene oil

4. Engine :

- ① Type : Water cooled or Air cooled diesel engine
- ② Output (Rated output) : 3.5 ~ 4.5 HP

5. Trailer :

- ① Material : Steel
- ② Tire size : 4.00 - 8 - 4 PR or equivalent

6. Accessories :

- ① Standards tool : 1 set

A-11. Hand guide roller

1. Type : Walk behind type vibration roller

2. Dimensions (mm) :

- ① Overall length : 2,200 ~ 2,400
- ② Overall width : 600 ~ 800
- ③ Overall height : 900 ~ 1,200

3. Dry weight : 450 ~ 55 kg

4. Performance :

- ① Vibration frequency : 3,000 Vpm
- ② Centrifugal force : 1,000 ~ 1,100 kg

5. Engine :

- ① Type : Water cooled or Air cooled diesel engine
- ② Output (Rating output) : 4.5 ~ 5.5 HP
- ③ Fuel oil tank capacity : 3.5 ~ 5.5ℓ

6. Sprinkler tank : 20 ~ 25ℓ

A-12. Road roller

1. Type : Three wheel macadam roller

2. Dimensions (mm) :

- ① Overall length : 5,100 ~ 5,400
- ② Overall width : 1,900 ~ 2,100
- ③ Overall height : 2,700 ~ 2,900
- ④ Wheel base : 2,700 ~ 3,000
- ⑤ Min. turning radius : 5,200 ~ 5,600

3. Dry weight : 10,000 ~ 12,000 kg

4. Linear static pressure :

- ① Front wheel : 24 ~ 28 kg/cm
- ② Rear wheel : 65 ~ 68 kg/cm

5. Traveling speed :

- ① Forward : Max. 9 ~ 11 km/h
- ② Reverse : Max. 9 ~ 11 km/h

6. Transmission :

- ① Type : Mechanical type
- ② Shift : 3

7. Engine :

- ① Type : 4 cycle, Water cooled diesel engine
- ② Output (Rating output) : 58 ~ 98 HP
- ③ Fuel oil tank capacity : 80 ~ 110ℓ

8. Ballast

- ① Water ballast : 500~ 540ℓ

A-13. Concrete mixer

1. Type : Tilting type mixer

2. Capacity : 0.1 ~ 0.2 m<sup>3</sup>

3. Prime mover :

- ① Type : Water cooled or Air cooled, Gasoline engine or Diesel engine
- ② Output (Rating output) : 4.5 ~ 6.5 HP

4. Tilting method : Manual by hand lever

A-14. Poker vibrator (Concrete vibrator)

1. Vibrating head :

- ① Dimension : 28 ~ 32 mm

2. Shaft diameter : Approx. : 10 mm

3. Horse diameter : Approx. : 29 mm

4. Vibration : 9,000 ~ 12,500 VPM

5. Lead shaft (Flexible shaft) : 4 ~ 6 m

6. Prime mover :

- ① Type : Gasoline engine
- ② Output (Max. output) : 5 ~ 6 HP

A-15. Diesel generator

- 1. Type : Brushless type AC generator
- 2. Output : 20 ~ 25 kVA
- 3. Phase and wire : 3 phase 4 wires
- 4. Power factor : 80%
- 5. Voltage : 400 / 230 volts
- 6. Frequency : 50 Hz
- 7. Engine :

- ① Type : 4 cycle, Water cooled diesel engine
- ② Output (Rating output) : 50 ~ 60 HP
- ③ Displacement : 1,800 ~ 2,100 cc
- ④ Starting system : Electric starter
- ⑤ Fuel oil tank : 40 ~ 50ℓ

- 8. Control panel : 1 set
- 9. Standard tool : 1 set

A-16. Low-bed trailer

- 1. Type : Low-bed type, semi-trailer
- 2. Max. payload : 15 ~ 20 ton

### 3. Truck :

#### 3-1. Engine

- ① Type : 4 cycle, Water cooled diesel engine
- ② Output : (Max. output/JIS) 180 ~ 240 HP
- ③ Fuel tank capacity : 180 ~ 250 ℓ

#### 3-2. Chassis

- ① Clutch : Dry type, single plate clutch
- ② Steering : Ball and screw type, Power assist.
- ③ Brake :
  - Service brake : Air brake, internal expansion, shoe type
  - Parking brake : Mechanical type (Hand), Internal expansion, Shoe type
- ④ Transmission :
  - Type : Constant mesh
  - Shift : Forward: 6 ~ 8  
Reverse : 1 ~ 2
  - Traveling speed : Max. 80 ~ 100 km/h
- ⑤ Tire size : 10.00 20 - 14 PR or equivalent

#### 3-3. Connecting for trailer

- ① Trailer coupler : SAE standards
- ② Brake connection : SAE standards
- ③ Electric : SAE standards

### 4. Trailer :

#### 4-1. Dimensions (mm)

- ① Overall length : 8,000 ~ 12,000
- ② Overall width : 2,400 ~ 2,600
- ③ Overall height : 1,300 ~ 1,700

4-2. Height of bed : 1,100 ~ 1,300 mm

4-3. Tire size : 900 - 20 - 14 PR or equivalent

A-17. Work shop tool (Welder)

1. Type : AC Arc welder
2. Secondary current range : 50 ~ 400 amps.
3. Electrode size : 2.6 ~ 8.0 mm
4. Dimensions (mm)
  - ① Overall length : 600 ~ 700
  - ② Overall width : 450 ~ 650
  - ③ Overall height : 800 ~ 900
5. Gross weight : 150 ~ 170 kg
6. Frequency : 50 Hz

A-18. Facsimile machine

1. Type : Desktop transceiver type
2. Applicable line : Public switched network
3. Effective scanning width : More than 200 mm (A4 size)
4. Recording roll length : More than 50m per one roll
5. Modem speed : 9,600 / 7,200 / 4,800 / 2,400 bps, automatic fullback
6. Recording method : Thermal printing or
7. Power supply : 230 Volt, 50 Hz, Single phase



A-19. Pick-up truck

1. Type : Double cab type, 2 WD
2. Dimensions (mm) :
  - ① Overall length : 4,400 ~ 4,850
  - ② Overall width : 1,500 ~ 1,700
  - ③ Overall height : 1,500 ~ 1,700
  - ④ Wheel base : 2,600 ~ 2,950
3. Pay load : 1,000 ~ 1,500 kg
4. Seating capacity : 5 ~ 6
5. Min. turning radius : 5.0 ~ 6.0m
6. Engine
  - ① Type : 4 cycle, Water cooled diesel engine
  - ② Max. output (SEA Net) : 60 ~ 90 HP
  - ③ Fuel oil tank capacity : 60 ~ 65ℓ
7. Transmission
  - ① Type : Gear type, constant mesh or synchro mesh
  - ② Shift : Forward : 4 ~ 5  
Reverse : 1
8. Steering :
  - ① Type : Ball and Nut type
  - ② Steering handle position : Right
9. Standard accessories :
  - ① Air condition : Standard
  - ② Radio : AM
  - ③ Seat belt : Standard
  - ④ Clock : Standard
  - ⑤ Standard tool : 1 set

## B: Specifications of the Equipment for Divisional Offices

### B-1. Pickup truck

1. Type : Single cap type, 2 WD
2. Dimensions (mm) :
  - ① Overall length : 4,400 ~ 4,900
  - ② Overall width : 1,600 ~ 1,800
  - ③ Overall height : 1,500 ~ 1,800
  - ④ Wheel base : 2,800 ~ 3,000
3. Pay load : 1,000 ~ 1,500 kg
4. Seating capacity : 3
5. Min. turning radius : 5.1 ~ 5.6m
6. Engine :
  - ① Type : 4 cycle, Water cooled diesel engine
  - ② Max. output (SAE Net) : 60 ~ 80 HP
  - ③ Fuel oil tank capacity : 60 ~ 65ℓ
7. Transmission :
  - ① Type : Gear type, constant mesh or synchro mesh
  - ② Shift : Forward : 4 ~ 5  
Reverse : 1
8. Steering :
  - ① Type : Ball and Nut type
  - ② Position of steering : Right
9. Standard accessories :
  - ① Air condition : Standards
  - ② Radio : AM
  - ③ Set belt : Standard
  - ④ Clock : Standard
  - ⑤ Standards tool : 1 set

## B-2. Farm tractor

1. Type : 4 wheel drive, AG tractor mounted on diesel engine
2. Dimensions (mm) :
  - ① Overall length : 3,400 ~ 3,800
  - ② Overall width : 1,500 ~ 1,800
  - ③ Overall height (At muffler end) : 2,200 ~ 2,400
  - ④ Wheel base : 1,800 ~ 2,100
3. Min. turning radius : 2.8 ~ 3.0m
4. Engine :
  - ① Type : 4 cycle, Water cooled diesel engine
  - ② Output (SAE Net) : 45 ~ 53 HP
  - ③ Fuel oil tank capacity : 50 ~ 70ℓ
5. Transmission :
  - ① Type : Gear type, Full-syncho or partial synchro mesh
  - ② Shift : Forward : 12 ~ 18  
Reverse : 4 ~ 6
  - ③ Travel speed : Max. : 24 ~ 29 km/h  
Min. : 0.2 ~ 0.6 km/h
6. Brake (Service brake) :
  - ① Type : Mechanical or Hydraulic, Wet disc
7. Tire size
  - ① Front wheel : 8 - 18 ~ 9.5 - 20 or equivalent
  - ② Rear wheel : 13.6 - 28 or equivalent
8. Hydraulic device
  - ① Type : Position and draft control
  - ② Hitch : SAE 1 (Category)
9. Implement
  - ① Disc plow : 1 set
  - ② Disk harrow : 1 set
  - ③ Trailer (Stationary) : 1 set

B-3. 2 wheel tractor (Power tiller)

1. Type : Walk behind, AG tractor mounted on diesel engine
2. Dimensions (mm) :
  - ① Overall length : 2,000 ~ 2,300
  - ② Overall width : 700 ~ 900
  - ③ Overall height : 1,100 ~ 1,300
3. Engine :
  - ① Type : 4 cycle, Water cooled diesel engine
  - ② Output (SAE Net) : 7 ~ 9 HP
4. Main clutch : Dry type, multi disc clutch
5. Tire size : 6 - 12 or equivalent
6. Tilling device :
  - ① Driving system : Center drive
  - ② Tilling width : 600 ~ 700 mm
7. Brake : Internal expansion brake
8. Trailer : 1 set

B-4. Pump

1. Type : Centrifugal type
2. Discharge pipe dia. : 2 inch
3. Suction pip dia. : 2 inch
4. Capacity : Approx. 400 ℓ/min.
5. Total head : 15 ~ 17m
6. Suction head : 6 ~ 7m

7. Prime mover :

- ① Type : Gasoline or diesel engine
- ② Output (SAE Net) : 3 ~ 5 HP
- ③ Fuel oil tank capacity : 2 ~ 3ℓ
- ④ Starting system : Handle or Recoil starter by manual

8. Accessories :

- ① Standard accessories : Strainer, coupling, hose band each one set
- ② Hose : Suction : 2 inch × 6m  
Delivery : 2 inch × 10m
- ③ Tool : 1 set

B-5. Trailer bowser

- 1. Type : Water tank mounted on trailer
- 2. Tank capacity : 600 British Gallon
- 3. Dimensions (mm) :
  - ① Overall length : Approx. 2,400
  - ② Overall width : Approx. 1,800
  - ③ Overall height : Approx. 900

B-6. Sprayer

- 1. Type : Semi-automatic hand sprayer
- 2. Tank capacity : 17 ~ 19ℓ
- 3. Dimension (mm) :
  - ① Overall length : 300 ~ 400
  - ② Overall width : 180 ~ 200
  - ③ Overall height : 460 ~ 510
- 4. Max. pressure : 5 ~ 9.0 kg/cm<sup>2</sup>
- 5. Dry weight : 5 ~ 7 kg

B-7. Diesel Generator

1. Rated output : 11 ~ 15 kVA
2. Phas/wire : 3 phase / 4 wire
3. Voltage : 230 / 400 Volt
4. Power factor : 80%
5. Engine:
  - ① Type : Water cooled or Air cooled diesel engine
  - ② Output (Rated output) : 16 ~ 20 HP
  - ③ Starting system : Manual or electric motor

B-8. Work shop tool

1. Electric drill

- ① Capacity : 21 mm for wooden work  
10 mm for metric work
- ② Revolution : Approx. 1,250 RPM
- ③ Power input : Approx. 380W
- ④ Power source : 230V, 50 Hz, Single phase

2. Welder

- ① Secondary current : Not less than 130 amps.
- ② Max. power input : 8 ~ 10 kVA
- ③ Electrodes size : More than 1.6~ 3.2 mm

3. Bench grinder

- ① Capacity (Wheel size) : External Dia. : Approx. : 205 mm  
Thickness : Approx. : 19 mm  
Hole dia. : Approx. : 16 mm
- ② Non-load speed : Approx. : 2,970 RPM
- ③ Power input : 645W
- ④ Power source : 230V, 50 Hz, Single phase

4. Bench vice :

- ① Width of Jaw : Approx. : 5 inch (127 mm)
- ② Opening : Approx. : 165 mm
- ③ Weight : Approx. : 22.5 kg

5. Anvil :

- ① Dimensions (L×H×W) : Approx. : 415×223×112 mm
- ② Weight : Approx. : 40 kg

6. Blacksmith blower :

- ① Firebed (Dia. and depth) : Approx. : 360 mm and 80 mm
- ② Revolution of electric motor : Approx. : 2,850 RPM
- ③ Weight : Approx. : 26 kg
- ④ Power source : 230V, 50 Hz, Single phase

7. Hand tool set (For work shop)

- ① Sockets : Hexagonal type : 8, 10, 11, 12, 13, 14
- ② Deep sockets : Hexagonal type : 8, 10, 12
- ③ Socket for plug (With magnet) : 20.6
- ④ Sockets: Dodecagon type : 17, 19, 21, 22, 24
- ⑤ Ratchet handle : 2 pcs.
- ⑥ Nut spinner handle : 1 pce
- ⑦ Extension bar : 75 mm (2 pcs), 150 mm (2 pcs),  
250 mm (1 pce)
- ⑧ Ball joint : 1 pce
- ⑨ Socket adapter : (12.7×9.5)
- ⑩ Open spanner (Double head) : 6×7, 8×9, 10×12, 11×13, 12×14,  
14×17
- ⑪ Double offset box wrench : 40°/Long type : 10×12, 11×13,  
12×14, 14×17,  
19×21, 22×24  
45°/Short type : 8×9, 10×12,  
12×14  
15°/Long type : 10×12, 14×17

- ⑫ Fare nut wrench : 10×11 (7/16)
- ⑬ Adjustable wrench : Nominal size : 300 mm
- ⑭ Combination plier : Nominal size : 200 mm
- ⑮ Water pump plier : Nominal size : 250 mm
- ⑯ Radio pench : Nominal size : 150
- ⑰ Pipe wrench : Nominal size : 300
- ⑱ Screw driver : ⊖ : 75, 100, 150  
⊕ : 75, 100, 150
- ⑲ Stubby driver : Plastic handle ⊕ and ⊖ (one each)
- ⑳ Integral handle screw driver : ⊖
- ㉑ Long handle screw driver : ⊖ and ⊕
- ㉒ Nut driver (Deep type) : 10 mm
- ㉓ Plastic hammer : One pound
- ㉔ Hexagonal L shape wrench : 2, 3, 4, 5, 6, 8, 10, 12
- ㉕ Chisel (Flat) : 19×165 mm
- ㉖ Center punch : 125 mm
- ㉗ Milled (Flat) tooth file : 200 ~ 220 mm
- ㉘ Point file : 130 mm
- ㉙ Oil stone (Combination) : 200×25×13 mm
- ㉚ Tool Box (Case) : 1 pce

#### 8. Circuit tester :

- ① Measuring range : DC voltage : 0, 0.25, 2.5, 12.5, 25, 125, 250, 1,250V  
AC voltage : 0, 5, 25, 125, 250, 500, 1,250V  
DC current : 0, 0.05, 5, 50, 500 mA  
Resistance : 0, 30 kΩ, 300 kΩ, 3 MΩ, 30 MΩ  
Decibel : -20 ~ 16 dB
- ② Power source : SUM3×2 pcs. (Single 1.5V batteries)

#### 9. AC Ammeters :

- ① Measuring range : 2 ranges, 5/25A

#### 10. AC Volt and Ammeter :

- ① Measuring : Range : 13 ranges  
Volt : 30, 75, 150, 300, 750V  
Ampere : 0.15, 0.3, 0.75, 1.5, 3, 7.5, 15, 30A



B-9. Hand tools for wood work

1. Hand saws : Length 600 mm
2. Plane :
  - ① Rebate plane : Cutting width 38 mm
  - ② Block plane : Cutting width 40 mm
  - ③ Smooth plane : Cutting width 45 mm
  - ④ Jack plane : Cutting width 50 mm
3. Marking gauge : Overall length 214 mm
4. Wood chisel : 1 set (1/2, 3/4, 1 inch)
5. Wood worker vice : ① Jaw width : 125 mm  
② Jaw opening : 90 mm
6. Hammer : 1 set (450g, 680, 910g, 1,360g)
7. G-clump : 1 set (50 mm, 65 mm, 75 mm)
8. Screw driver : 1 set (7 pcs.)
9. Try squares : Overall length : 12 inch
10. Hand drill : ① Chuck width : 9 mm  
② Type : 3 Jaw type
11. Tape scale : 2m × 13 mm

B-10. Power hacksaw

1. Purpose : Cutting bundle, pipe and angle iron
2. Cutting capacity : Not less than 175 mm
3. Blade size : Approx. 350 × 25 × 1.25 mm
4. Coolant tank capacity : More than 4ℓ

- 5. Driving system : Driven by motor
- 6. Power source : 230V, 50 Hz, Single phase
- 7. Others : ① Electric lead wire : length : 2m  
② Plug : As Sri Lankan standards

**B-11. Manson's tool set**

- 1. Cold chisel : 16, 19, 22 mm
- 2. Punch chisel : 16, 19, 22 mm
- 3. Cape chisel : 16, 19, 22 mm
- 4. Chisel with handle : 32 mm
- 5. Brick chisel : 75 mm
- 6. Tile chisel : 6, 8 mm
- 7. Hammer for brick : 1 pce.
- 8. Hammer for block : 1 pce.
- 9. Ball hammer : 0.9 kg, 1.5 kg
- 10. Carpenter tool (Spade type) : S, M and L size, each one
- 11. Pointing trowel : 1 pce.
- 12. Plaster tool : 1 pce.
- 13. String : 100m×1 pce.
- 14. Plumbing bob : 500g, 100g
- 15. Convex rule : 5m
- 16. Measuring tape : 30m

- 17. Aluminum level : 1 pce.
- 18. Stand level : 1 pce.
- 19. Tool box : 450×190×160 mm

B-12. Motor cycle

- 1. Type : Dual road type motor cycle
- 2. Engine :
  - ① Type : 2 cycle, Single cylinder gasoline engine
  - ② Displacement : 90 ~ 100 cc
  - ③ Output (DIN.) : 11 ~ 13 ps.
  - ④ Fuel oil tank capacity : 8 ~ 9ℓ
- 3. Dimensions :
  - ① Overall length : 2,000 ~ 2,200
  - ② Overall width : 800 ~ 900
  - ③ Overall height : 1,100 ~ 1,200
  - ④ Wheel base : 1,100 ~ 1,200
- 4. Transmission : ① Shift: 5 ~ 6
- 5. Tire size :
  - ① Front wheel : 2.75 - 21 4 PR or equivalent
  - ② Rear wheel : 3.00 18 - 4 PR or equivalent

B-13. Duplicating machine with scanner

- 1. Duplicator :
  - ① Max. paper size : B4
  - ② Printing speed : Not less than 80 copies/minute
  - ③ Paper quantity : Not less than 500 sheets
  - ④ Counter : Number of four figures
  - ⑤ Power source : 230V, 50 Hz, Single phase

- ⑥ Other :
  - Stencil : 200 sheets
  - Correction fluid : 12 pcs.
  - Ink : 400g × 20 pcs.

2. Scanner :

- ① Purpose : Stencil cutter for duplicating machine
- ② Max. size of scanning : Not less than 240 × 350 mm
- ③ Speed of scanning (At B4 size) : Within 6 minute (At Max. speed)
- ④ Shift of scanning : 2 ~ 3
- ⑤ Power source : 230V, 50 Hz, Single phase
- ⑥ Others :
  - Stencil for scanner : 200 sheets
  - Stylus : 50 pcs.

B14. Survey equipment

1. Auto-level :

- ① Type : Non Waterproof type
- ② Magnification : 32x
- ③ Minimum focus : Approx. : 700 mm
- ④ Tripod : Madder by metal and adjustable tripod
- ⑤ Other accessories : Aluminum staff : 5m × 2 pcs

2. Transit :

- ① Magnification : 27x
- ② Minimum focus : Approx. 1.3m
- ③ Plate level : 20 sec.
- ④ Tripod : Madder by metal and adjustable tripod
- ⑤ Other accessories : Pole : 2m × 2 pcs.

Appendix: A-11 Members of the Study Team and Period Dispatched

<u>Name</u>	<u>Task</u>	<u>Affiliation</u>	<u>Period Dispatched</u>
Kenji Kiyomizu	Team Leader	Development Specialist on Civil Engineering, JICA	Aug. 21 to Sep. 1
Kenichi Shishido	Planning Cordinator	First Basic Design Study Division, Grant aid Study and Design Department, JICA	- do -
Tatsumi Tanabe	Project Planner (in charge of the project)	CKC	Aug. 10 to Sep. 28 Dec. 14 to Dec. 22
Koichiro Hino	Equipment Planner ( I )	- do -	- do -
Takishi Tamura	Rural Institution Planner	- do -	- Sep. 1 to Sep 28 -
Kozo Fujita	Equipment Planner ( II )	- do -	- do -

Appendix A-12 List of Personnel Met

<u>Name</u>	<u>Affiliation</u>	<u>Position</u>
Hideo Yasuki	JICA, Colombo Office	Representative
Mitsuyoshi Kawasaki	- do -	Staff Member
Isamu Nitta	Embassy of Japan	Ambassador
Shin Murakami	- do -	First Secretary
Sakae Kubota	- do -	Second Secretary
Mr. R. Paskralingam	MPPI	Secretary
Mr. C. Maliyadde	RDD of MPPI	Director
Dr. R. M. K. Ratnayake	Janasaviya Division of MPPI	- do -
Mr. Jagathoma	RDD of MPPI	Depty Director
Mr. G. Pallewatte	MPPI	Chief Accountant
Mr. D. L. Mudalige	- do -	Engineering Consultant
Mr. V. Wijeratne	- do -	- do -
Mr. S. Weerapana	ERD, Ministry of Finance	Deputy Director
Mr. Y. B. Pussadewya	Sabaragamuwa Provincial Council	Chief Secretary
Mr. Y. B. Disanayake	North Western	"
Mr. A. B. Jalagune	Uva	"

<u>Name</u>	<u>Affiliation</u>	<u>Position</u>
Mr. S. M. Tennakoon	Central Provincial Council	Chief Secretary
Mr. K. B. Sirisena	North Central "	"
Mr. Alben Ribicuyala	Southern "	"
Mr. L. W. Jirasinghe	Western "	"
Mr. Y. Gamage	Kolonne Divisional Office	Secretary
Mr. Devapria	Embilipitiya " (S.B.P)	"
Mr. Swil Hewa	Aranayake " (S.B.P)	"
Mr. G. Senavirathe	Galigamuwa " (S.B.P)	"
Mr. Wijepala	Kandeketiya " (U.P)	"
Mr. Weerasene	Ridimaliyadde " (U.P)	"
Mr. P. L. Nandasiri	Laggal " (C.P)	"
Mr. Illangacoon	Wilgamuwa " (C.P)	"
Mr. Nanayekarara	Walapane " (C.P)	"
Mr. Dissanayake	Hanguranketha " (C.P)	"
Mr. Rajakaruna	Pujapitiya " (C.P)	"
Mr. Siddique	Akurana " (C.P)	"
Mr. Deepal Hernando	ICTAD Training Centre (Galkulama)	"
Mr. Ambagaspitiya	Gallewela Divisional Office (C.P)	"
Mr. D. A. Kalubovila	Hanwella " (W.P)	"
Mr. S. Liyanagama	Homagama " (W.P)	"
Mr. M. M. C. Perdnando	Agalawatta " (W.P)	"
Mr. W. A. Sirisena	Walallawita " (W.P)	"
Mr. W. D. A. A. Calistus	Divulapitiya " (W.P)	"
Mrs. N. R. Guuasekasa	Mirigama " (W.P)	"
Mr. K. M. Bandara	Kobeigane " (N.W.P)	"
Mr. W. G. Dayanadna	Nikaweratia " (N.W.P)	"
Mr. H. R. Sirilal	Kotavehera " (N.W.P)	"
Mr. H.M.P.B. Abeysinghe	Navagattegama " (N.W.P)	Chief Accountant
Mr. N. P. Vijitha	Karuwalagaswewa " (N.W.P)	Secretary
Mr. W. Karunamupu	Rambawa " (N.C.P)	"

<u>Name</u>	<u>Affiliation</u>	<u>Position</u>
Mr. N. B. Udagedara	Elahera Divisional Office (N.C.P)	Secretary
Mr. K. B. Dissanayake	Higurakgoda " (N.C.P)	"
Mr. B.M. Suniltillakaratna	Horowupotna " (N.C.P)	"
Mr. P. B. Ratnayake	Thirappane " (N.C.P)	"
Mr. N. A. Piyasewa	Kamburupitia " (S.P)	"
Mr. M. H. Piyadasa	Niyagama " (S.P)	"
Mr. R. C. Dezoyasa	Hambantota " (S.P)	"
Mr. C. N. Withanachchi	Suiryawewa " (S.P)	"
Mr. P. G. A. Henry	Katuwana " (S.P)	"
Mr. R. Bentjerodt	World Bank	Senior Operations Officer
Mr. E. Dahl	NORAD	Representative Sri Lanka, Office
Mr. R. Weerasinghe	- do -	Senior Programme Officer
Mr. R. B. Morapaya	SIDA	Local Programme Officer

#### Appendix A-13 List of Collected Data and Documents

<u>Name of Material</u>	<u>Publishing Agencies</u>
Resources Profile [ HAKUMANA ]	MPPI
" [ KAMBURPITIYA ]	- do -
" [ NIYAGAMA ]	- do -
" [ KARANDENIYA ]	- do -
" [ HAMBANTOTA ]	- do -
" [ GALIGAMUWA ]	- do -
" [ EMBILIPITIYA ]	- do -
" [ WILGAMUWA ]	- do -
" [ LAGGALA-PALLEGAMA ]	- do -
" [ PUJAPITIYA ]	- do -
" [ AKURANA ]	- do -
" [ WALAPANE ]	- do -
" [ KANDAKETIYA ]	- do -
" [ RIDIMALIEDDA ]	- do -

<u>Name of Material</u>	<u>Publishing Agencies</u>
Resources Profile [ AGALAWATTA ]	MPPI
" [ HOMAGAMA ]	- do -
" [ HOROWPATHANA ]	- do -
" [ RAMBAWA ]	- do -
" [ KARUWALAGASWEWA ]	- do -

<u>Name of Material</u>	<u>Publishing Agencies</u>
Sri Lanka Labour Force Survey (1990)	Statistic Department, MPPI
Annual Survey of Industries (1989)	- do -
National Accounts of Sri Lanka (1989)	- do -
Statistical Pocket Book of Sri Lanka (1990)	- do -
Statistical Abstract of 1989	- do -
Public Investment (1990-1994)	National Planning Department, MPPI
Food Balance Sheet (1989)	Statistic Department, MPPI
System of Identification Codes for Sri Lanka Government Institutions	Plan and Implementation Department, MPPI
Special Review of Janasaviya Round I Accelerated Programme	Janasaviya Committee Department, MPPI
Guidelines for the Implementation of Janasaviya Programme	Janasaviya Department, MPPI
Socio-Economic Achievements of Sri Lanka (1990)	Statistic Department, Central Bank of Sri Lanka
Price and Wage Statistics (1988-1989)	- do -
Sri Lanka Socio-Economic Data 1991	Statistics Department, Central Bank of Sri Lanka
Central Bank of Sri Lanka (1991) Bulletin	"
Economic Performance, The First Half of 1988	"
Central Bank of Sri Lanka, Annual Report (1990)	ERD
Foreign Aid Indicators of Sri Lanka (1989)	World Bank's Report
Sri Lanka A Break with the Past The 1987-90 Program of Economic Reforms and Adjustment	"
Memorandum and Recommendation of the International Development Association (1991)	IRDP
Schedule of Operations of the 1991 (IRDP), Ratnapura	MPPI



<u>Name of Material</u>	<u>Publishing Agencies</u>
Janasaviya Programme, Implementation guidelines No. 1	MPPI
Janasaviya Trust Fund (Introduction Book)	Local Government, Housing and Construction Ministry
Construction Equipment Operator Training Center ICTAD	MPPI
Farm Mechanization Operator Training Center Anuradhapura	Extension Department of Agrarian Service Office
Shelter for 1.5 Million Families	NHDA
Million Houses Programme of Sri Lanka	- do -
The Wild the Free the Beautiful	Mr. Nihal Fernando
Janasaviya Programme (Guide Line)	MPPI
Janasaviya Programme Dependant Families Survey Papers	- do -
Janasaviya Programme Dependants List (Partial)	- do -
Janasaviya Programme Family Profile Survey Papers	MPPI
Revised Criteria for Classification of Roads	- do -
Road Maintenance Manual (1989)	- do -
List of Equipment at Peliyagoda Central Workshop	State Engineering Corp.
Sri Lanka Province Map	MPPI
List of AGA's [ Janasaviya Programme ]	- do -
Lease Price Table	Housing Ministry
Work Programme (38 Divisions)	MPPI
Daily Running chart of Vehicles	- do -
Vehicle Log Book	- do -
List of Requested Equipment (Old)	- do -

Appendix : A-14 Minutes of Discussion (1)

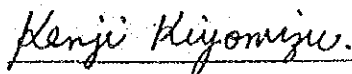
MINUTES OF DISCUSSION  
ON THE BASIC DESIGN STUDY  
ON THE PROJECT FOR ACQUISITION OF EQUIPMENT  
TO STRENGTHEN THE DIVISIONAL SECRETARIES' DIVISIONS

In response to the request of the Government of the Democratic Socialist Republic of Sri Lanka, the Government of Japan decided to conduct a Basic Design study on the Project for Acquisition of Equipment to Strengthen the Divisional Secretaries Divisions (hereinafter referred to as "the Project") and the Japan International Cooperation Agency (hereinafter referred to as "JICA") sent a study team, headed by Mr. Kenji KIYOMIZU, Development Specialist on Civil Engineering, JICA from August 10 to September 28, 1991.

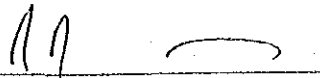
The team had a series of discussions with the authorities concerned of the Government of Sri Lanka and conducted a field survey in the proposed project area.

As a result of the discussions and field survey, both parties confirmed the main issues described in the attached document. The team will further proceed with the works and prepare the Basic Design Study Report on the Project based on the issues.

Colombo, August 30, 1991



Mr. Kenji KIYOMIZU  
Leader,  
Basic Design Study Team,  
JICA



Mr. R. Paskaralingam  
Secretary,  
Ministry of Policy Planning  
& Implementation

ATTACHED DOCUMENT

1. The Objectives of the Project

The objectives of the Project are to strengthen the Divisional Secretaries' Divisions through the procurement of equipment, and thus contributing to the improvement of rural infrastructure and the creation of job opportunities.

2. The Project requested by the Government of Sri Lanka

The target divisions and Equipment requested by the Government of Sri Lanka are listed in ANNEX I

3. Executing Agency

Ministry of Policy Planning & Implementation will bear overall responsibilities for the administration and execution of the Project. The organization chart is shown in ANNEX II

4. Grant Aid Programme Explained by the Team

1) The Government of Sri Lanka has understood the system of Japanese Grant Aid explained by the Team.

2) The Government of Sri Lanka will take the necessary measures described in Annex III for smooth implementation of the Project on condition that the Grant Aid Assistance by the Government of Japan is extended to the Project.

5. Other Important Information

1) The Sri Lankan Government has explained the Strengthening Plan for the Divisional Secretaries' Divisions which is described in ANNEX IV.

2) Both sides have confirmed the criteria for selecting equipment described in ANNEX V in principle.

6. Schedule of the Study

1) JICA will prepare the draft report on the Project in English and dispatch a mission to Sri Lanka in order to explain the contents of the report in/or around December, 1991.

2) In case that the contents of the report is accepted in principal by the Government of Sri Lanka, JICA will complete the final report on the Project and send it to the Government of Sri Lanka by the end of February, 1992.

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ANNEX I : Project Requested by the Government of Sri Lanka

1. Target Divisional Secretaries' Divisions

Provinces	the Divisional Secretaries' Divisions (Janasavia round I ) (Janasavia round II )	
	Western Province	Hanwella Divulapitiya Agalawatta
Central Province	Akurana Galewela Walapane	Ududumbara Pujapitiya Wilgamuwa Laggala Ranguranketha
Southern Province	Niyagama Suriyawewa Hambantota Hakmana	Karandeniya Kamburupitiya Katuwana
North Western Province	Kobeigane Karuwalagaswewa	Kotavehera Nikaweratiya Navagattegama
North Central Province	Horowupatna Elahera	Rambewa Thirappane Hingurakgoda
Uva Province	Ridimaliyadde Madulla	Kandeketiya Siyambalanduwa
Sabaragamuwa Province	Embilipitiya Aranayake	Kolonne Galigamuwa

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2. Equipment List

The following equipment have been requested by the Sri Lankan side;

Provincial Level for common use		Divisional Level	
No	Items	No	Items
1	Motor Grader	1	Pick-up Truck
2	Bulldozer	2	Farm Tractor(4 Wheel)
3	Tipper Truck	3	2 Wheel Tractor w/attachment
4	Cargo Truck	4	Water Pump
5	Loader w/Backhoe Excavator	5	Trailer Bowser
6	Air Compressor	6	Hand Sprayer
7	Breaker	7	Diesel Electric Generator
8	Rock Drill	8	Workshop Tools
9	Portable Crusher	9	Hand Tools for Wood Work
10	Tar Kettle w/sprayer	10	Power Hacksaw
11	Double Drum vib Roller	11	Manson's Tool Set
12	Road Roller	12	Motor Cycle
13	Concrete Mixer	13	Duplicator w/Scanner
14	Poker Vibrator	14	Survey Equipment
15	Diesel Electric Generator		
16	Low-Bed Trailer w/Power unit		
17	Maintenance Equipment for Machinery		
18	Fax Machine		
19	Pick up Truck		

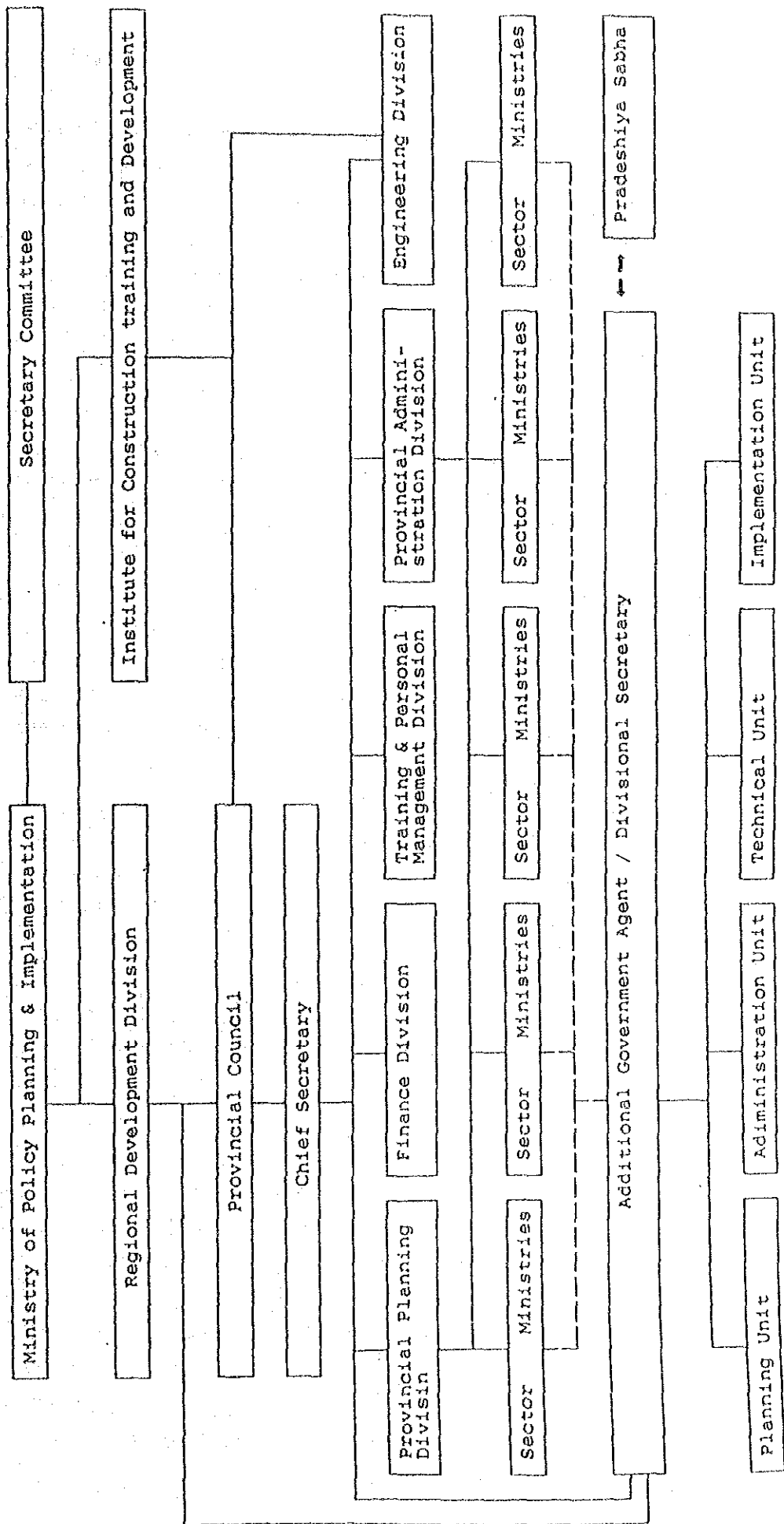
Note) The allocation and the specification will be determined based on the assessment of the team.

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ANNEX II : Organization Chart



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<PRKOHZU-4>

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ANNEX III : Necessary measures to be taken by the Government of Sri Lanka

1. To provide data and information necessary for implementation of the Project.
2. To ensure prompt unloading, tax exemption, customs clearance of the goods for the Project at the port of disembarkation in Sri Lanka and prompt internal transportation therein of the products purchased under the Grant Aid.
3. To exempt Japanese nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in Sri Lanka with respect to the supply of the products and services under the verified contracts.
4. To provide necessary permissions, licences and other authorization for carrying out the Project.
5. To bear two kinds of commissions to the Japanese foreign exchange bank for the banking services based on the Banking Arrangement as follows:
  - (1) Advising commission to the Authorization to Pay
  - (2) Payment commission
6. To bear all the expenses, other than those to be borne by the Grant Aid.
7. To ensure the necessary budget and personnel for the proper and effective use of the equipment, including operation and maintenance of the equipment provided under the Grant Aid.

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## ANNEX IV : Strengthening Plan for the Divisional Secretaries' Divisions

Government has decided to strengthen Divisional Secretary(DS) Division in every respect. Under this government has provided following facilities and authorities to each DS -

1. Financial authority
2. Additional technical administrative and development staff
3. Co-ordination and programming for development activities and Janasavia Program

### 1. FINANCIAL AUTHORITY

Divisional Secretaries have been empowered to operate a separate Bank Account under new regulations. They can receive imprests from different organization for different programs. They also have been authorised to decide on all matters related to tenders up to Rs.500,000/-. With this extended authority, the Divisional Secretaries can decide on bulk of the development activities undertaken in his Division. Also the Divisional Secretary was a Class II Grade II SLAS Officers but now is a Class II Grade I post. He is enjoying the status of a Head of the Department.

### 2. ADDITIONAL STAFF

Divisional Secretaries have now been given an additional administrative, technical, accounting and planning staff. Earlier he was the only officer in the executive grade available in the Division. He was supported by a small administrative staff and PIO. Now the Govt. is planning to provide additional executive grade officers, a fully equipped Planning Unit, Accounting Unit and a Construction and Maintenance Unit. The approved cadre for Divisional Secretary in terms of public sector restructuring project funded by the World Bank is indicated in cadre report of the Ministry of Public Administration, Provincial Councils & Home Affairs. In the past DS was simply carrying out administrative matters such as issue of licences, permits, food stamps etc. With the above facilities and authorities DS will be the focal point in the entire development activities in the country. To make this role meaningful government has decided to strengthen the DS Division with the provision of basic equipment and machinery required for construction and maintenance work. There are a host of activities to be undertaken in the field of buildings, construction of

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irrigation schemes, road and maintenance of such assets. Government also emphasises that these work should be more labour intensive to provide employment opportunities to unemployed poor people in the Division. DS is co-ordinating this activities. The machinery and equipment will strengthen this role.

Government is recruiting 300 Assistant Directors for planning and monitoring activities from 1st January 1992. The examination will be held on the 7th of September 1991 to select these officers. One Assistant Director will be attached to each DS Division. These officers will be working directly under the DS but also be responsible to Secretary/Policy Planning and Implementation. In fact these officers will attend all matters related to development programs within DS Division on behalf of DS in consultation with the Regional Development Division.

At present there are Plan Implementation Offices attached to each DS Division carrying out these functions. They are also employees of the Ministry of Policy Planning and Implementation. Since construction and maintenance work of irrigation schemes, road, buildings etc. are directly related to development and Janasavia activities, the co-ordination at national level is kept with the Ministry of Policy Planning and Implementation. The Regional Development Division will perform this function on behalf of the Ministry.

At the next level, the Provincial Council will co-ordinate. The Deputy Secretary (Monitoring & Planning ) and his staff will perform this function on behalf of the Provincial Council in close consultation with the Regional Development Division. In fact these officers are trained and loaned by the Regional Development Division. They are still a part of the Regional Development Division. At the DS level the planning staff headed by the Asst. Director will co-ordinate. He will consult both the Provincial Council and the Regional Development Division. Although construction, maintenance work are of a technical nature, the government has decided that it should be co-ordinated by an apex Ministry such as the Ministry of Policy Planning and Implementation which is functioning directly under H.E. the President as such work

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is directly related to all activities, employment generation, Janasavia program etc.

Further the staff at every level and every type has to be trained. This will be done by the Ministry of Policy Planning & Implementaion with the assistance of ICTAD. It is also an institution under the Ministry. This is the apex organization at the centre which co-ordinates all training and development work related to construction and training.

The highest executive body to discuss all activities is the Secretaries Committee. This Committee meets once a week under the chairmanship of Secretary, Ministry of Policy Planning and Implementation. In his capacity as the Chairman of this Committee he is in a better position to supervise and monitor the activities related to this project.

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ANNEX V : Criteria for Selection of Equipment

In preparation and finalisation of the equipment procurement plan the following criteria will be applied:

1. The financial and technical viability of the work programs which are examined by the team.
2. The maximum utilization of man-power to absorb unemployed people in the division.
3. Grass-roots' needs by each division to ensure the alleviation of the rural poor in the division.
4. The capability of each Divisional Secretaries' Office.
5. The strengthening plan described in ANNEX IV.
6. The availability of equipment at each local authority.
7. Such equipment which may not be fully utilized at the divisional level program will be kept in the province and will be utilized according to the demands by the target divisions.
8. Equipment for each province and division will be identified within the scope of supporting the work programs of the Divisional Secretaries' Offices.

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Appendix:A-15 Minutes of Discussion (2)

MINUTES OF DISCUSSION  
ON THE BASIC DESIGN STUDY  
ON THE PROJECT FOR ACQUISITION OF EQUIPMENT  
TO STRENGTHEN THE DIVISIONAL SECRETARIES' DIVISIONS  
(EXPLANATION OF DRAFT FINAL REPORT)

In August 1991, the Japan International Cooperation Agency (herein after referred to as JICA) dispatched the Basic Design Study Team on the Project for Acquisition of Equipment to Strengthen the Divisional Secretaries' Divisions(hereinafter referred to as the Project), and through a series of discussions, field survey in Sri Lanka , and technical examination of the results in Japan, has designed the appropriate plan for the Project and prepared the Draft Report of the Basic Design Study.

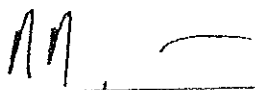
In order to explain and to consult on the components of the Draft Report, JICA sent a team, from December 14th to 22nd, 1991.

As a result of the discussions, both parties confirmed the main items described on the attached document.

Colombo, February 28th, 1992

  
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Mr. Yoshiaki SAKAMAKI  
Resident Representative,  
Sri Lanka Office,  
JICA

  
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Mr. R. Paskaralingam  
Secretary,  
Ministry of Policy  
Planning & Implementation

ATTACHED DOCUMENT

1. Components of Draft Report

The Government of Sri Lanka has agreed and accepted in principle the components of the Draft Report proposed by the team.

2. Japan's Grant Aid System

(1) The Government of Sri Lanka has understood the system of Japan's Grant Aid explained by the team.

(2) The Government of Sri Lanka will take the necessary measures, described in Annex I, for smooth implementation of the Project on condition that the Grant Aid Assistance by the Government of Japan is extended to the Project.

3. Internal Transportation and installation of the Equipment

(1) Both parties have confirmed that the Sri Lankan side shall bear all expenses for internal transportation and installation of the equipment purchased under the Grant Aid, in case that the Grant Aid Assistance by the Government of Japan is extended to the Project.

4. Operation and Maintenance of Equipment

The Government of Sri Lanka has agreed to carry out the following recommendation on the operation and maintenance of equipment which is expressed at the Chapter 5 [5.2 Conclusions] in the Draft Report.

1) At the divisional level, assignment of engineers, securing of appropriate storage for equipment and parts prior to the Project implementation and allocation of operation and maintenance budget for deployed equipment.

2) Establishment of a monitoring system. The monitoring program would comprise the nature of use of equipment for public works, operational works, operational hours, operation and maintenance conditions (including funding), personnel deployment, etc.

5. Further schedule

JICA will complete the Final Report in accordance with the confirmed items, and send it to the Government of Sri Lanka by the end of March, 1992.

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ANNEX I : Necessary measures to be taken by the Government of Sri Lanka

1. To provide data and information necessary for implementation of the Project.
2. To ensure prompt unloading, tax exemption, customs clearance of the goods for the Project at the port of disembarkation in Sri Lanka and prompt internal transportation therein of the products purchased under the Grant Aid.
3. To exempt Japanese nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in Sri Lanka with respect to the supply of the products and services under the verified contracts.
4. To provide necessary permissions, licences and other authorization for carrying out the Project.
5. To bear two kinds of commissions to the Japanese foreign exchange bank for the banking services based on the Banking Arrangement as follows;  
(1) Advising commission to the Authorization to Pay  
(2) Payment commission
6. To bear all the expenses, other than those to be borne by the Grant Aid.

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JICA