

Section 3

S3.1: 1 Norms for RR Maintenance

SUMMARY

- Nation-wide Norms for RR maintenance
- Practical norms uses



S3.1: 1 Norms for RR Maintenance

Why norms?

- ❑ Norms of Routine Maintenance give maintenance requirements of a kilometer in a year for different types of rural road.
- ❑ Norms of Repairing Works Estimate define the demands of material, labor and machine to carry out each item of repairing construction works



Example of Nation-wide norms

Norm
of routine maintenance
Rural Road
- 1996-

Norm of Routine Maintenance Management - Rural Road Maintenance, Ministry of Transport, VN - 1996.



Norm
of Road routine
maintenance
-2001-

Norm of Routine Road Maintenance 2001 by Ministry of Transport VN.



Norm
of repairing works
estimate
- 2000 -

Norm for estimation of repairing works - 2000 by Minister of Construction, VN - Part II: Norm for estimation in bridge and road repair.



MINISTRY OF TRANSPORT
**RURAL ROAD
MAINTENANCE HANDBOOK**
(For Commune Level)



TRANSPORT PUBLISHING HOUSE
Ha Noi - 2003

Norm of common rural road maintenance items can be referred in ***Rural Road Maintenance Handbook***



Practical use of norms

maintenance demand of 1.6 km bituminous road

No.	Descriptions	Unit	Stipulated quantity	Road length	Maintenance demand
A Management works					
1	Inspection, settlement of offences	Daywork	2	1.6	3.2
B Traffic safety					
2	Paint and repair guide posts and signs	Daywork	1	1.6	1.6
C Subgrade & drainage					
3	Grass cutting	Daywork	3	1.6	4.8
4	Ditch cleaning in wet season	Daywork	2	1.6	3.2
5	Side drain clearing	m/daywork	500/16.67	1.6	800/26.67
6	Shoulder reshaping	m ²	400/26.67	1.6	640/26.67
7	Drain excavating	m ³	5/5	1.6	8/8
8	Embankment/ Shoulder replenishing	m ³	5/2.5	1.6	8/4
9	Small landslide removal	m ³	4/2	1.6	6.4/3.2
10	Clean tow section (if necessary)	Daywork	2	1.6	3.2



Sample of how to calculate unit price of a road maintenance item

1. Unit costs of some work items:

1.1. Pothole filling on gravel surface; Average depth of pothole is 10cm, calculated for 1m² of pothole.

Table 18

No	Consuming items	Unit	Quantity	Unit cost	Cost	Remark
1	Material					
	Gravel	m ³	0.1428	120000	17136.00	
	Clay	m ³	0.004	20000	80.00	
	Coarse sand	m ³	0.0102	54300	553.86	
2	Labour grade 2,5/7	md	0.1429	11354.31	1622.5	Material unit price is depended on locality and time
3	Equipment Roller 8.5T	shift	0.012	266728.27	3200.74	
	Other equipment	%	5		160.04	
Total					22753.14	

Necessary material and machine for an unit of road maintenance item - This figure is taken from **norm of capital construction estimate**

Necessary daywork for an unit of road maintenance item - This figure conforms to labor **productivity from norm of rural road maintenance**

Labor and machine unit price conforms to Government Regulation



Section 3

S3.2: Cost estimating

SUMMARY

- The structure of cost estimating sheets and the steps to establish a cost estimate for rural road maintenance
- Cost estimate

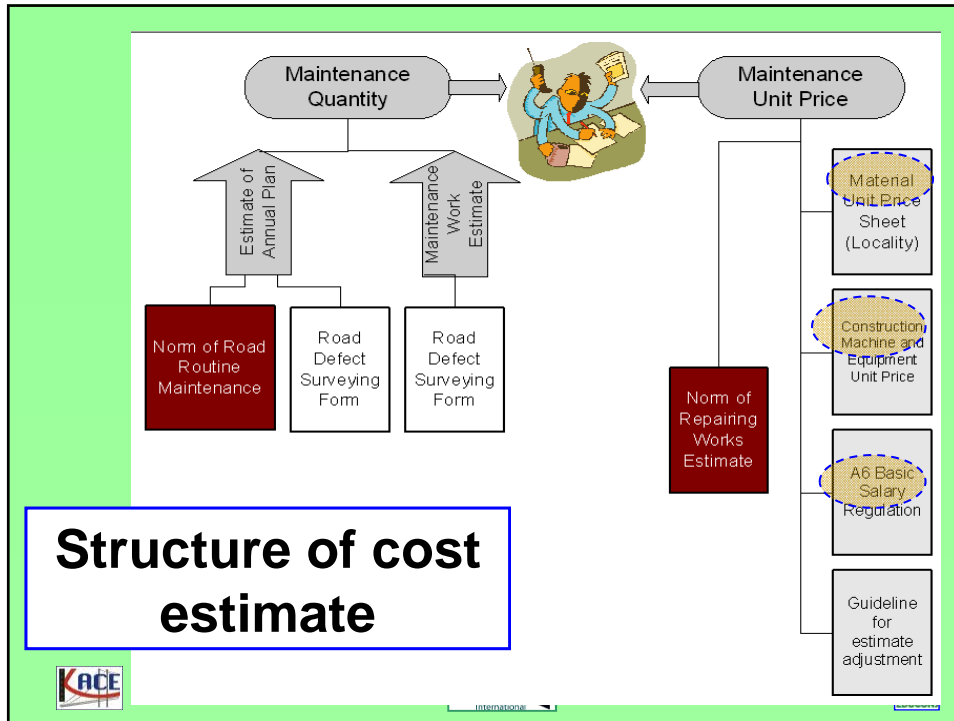


S3.2: Cost estimating

Maintenance Estimate of a rural road

- Estimate of an Annual Maintenance Plan is made with a demand that conforms to Norms of Routine Maintenance.
- Maintenance Estimate of a rural road is made with a demand that is defined by road defects surveying





S3.2: Cost estimating

Sample of annual plan estimate

maintenance demand of 1.6 km bituminous road

No.	Descriptions	Unit	Stipulated quantity	Road length	Maintenance demand
A	Management works				
1	Inspection, settlement of offences	Daywork	2	1.6	3.2
B	Traffic safety				
2	Paint and repair guide posts and signs	Daywork	1	1.6	1.6
C	Subgrade & drainage				0
3	Grass cutting	Daywork	3	1.6	4.8
4	Ditch cleaning in wet season	Daywork	2	1.6	3.2
5	Side drain clearing	m/daywork	500/16.67	1.6	800/26.67
6	Shoulder reshaping	m ²	400/26.67	1.6	640/26.67
7	Drain excavating	m ³	5/5	1.6	8/8
8	Embankment/ Shoulder replenishing	m ³	5/2.5	1.6	8/4
9	Small landslide removal	m ³	4/2	1.6	6.4/3.2
10	Clean tow section (if necessary)	Daywork	2	1.6	3.2

The KACE logo is in the bottom left, and the otb EDUCONS logo is in the bottom right.

S3.2: Cost estimating

Sample of Unit Price Calculation Sheets

Table 2: Unit Price Calculation Sheets of some road maintenance items

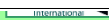
Code	Descriptions	Unit	Quantity	Unit Price	Cost	Note
XR.33.41	<u>Crack sealing, bitumen ratio is 2.5kg/m2</u>	sqm	1			
	<i>Materials</i>				9,719	
	1 x 2 crushed stone	cu.m	0.015	101000	1,515	
	0.015-1 chippings	cu.m	0.015	110000	1,650	
	Bitumen	kg	2.675	2450	6,554	
	<i>Labour</i>				514	
	Class 4/7	daywork	0.038	13529	514	
	<i>Construction Machine</i>				1,358	
	8.5 tons roller	daywork	0.003	252823	758	
	Bitumen heating tank	daywork	0.005	120000	600	



S3.2: Cost estimating

**Estimate of
1.6 km
bituminous
road repair**

ID	Description	Unit	Qty	Unit price			Amount		
				Material	Labor	Machinery	Material	Labor	Machinery
A	Management works								
1	Inspection, settlement of offences	daywork	3.2		10,000			32,000	
B	Traffic safety								
2	Paint and repair guide posts and signs	daywork	1.6		10,000			16,000	
C	Sub-grade & drainage								
3	Grass cutting	daywork	4.8		10,000			48,000	
4	Ditch cleaning in wet season	daywork	3.2		10,000			32,000	
5	Side drain clearing	m	800		10,000			8,000,000	
6	Shoulder reshaping	sq.m	640		10,000			6,400,000	
7	Drain excavating	cu.m	8		10,000			80,000	
8	Embankment/ Shoulder replenishing	cu.m	8		10,000			80,000	
9	Small landslide removal	cu.m	6.4		10,000			64,000	
10	Clean tow section (if necessary)	daywork	3.2		10,000			32,000	
D	Pavement								
11	Pothole filling	sq.m	32	34,844	2,814		1,115,013	90,049	
12	Corrugation grading	sq.m	96	9,719	514	1,358	933,000	49,354	130,413
13	Materials refilling	cu.m	3.2	135,390	12,533		433,248	40,107	
E	Soft spot repair								
14	Pavement watering	daywork	1.6		10,000			16,000	
15	Culvert & bridge (less than 10m span)	daywork	1.6		10,000			16,000	
Total							2,481,261	14,995,510	130,413



Discussion

**Cambodian procedures for
maintenance costing ?**



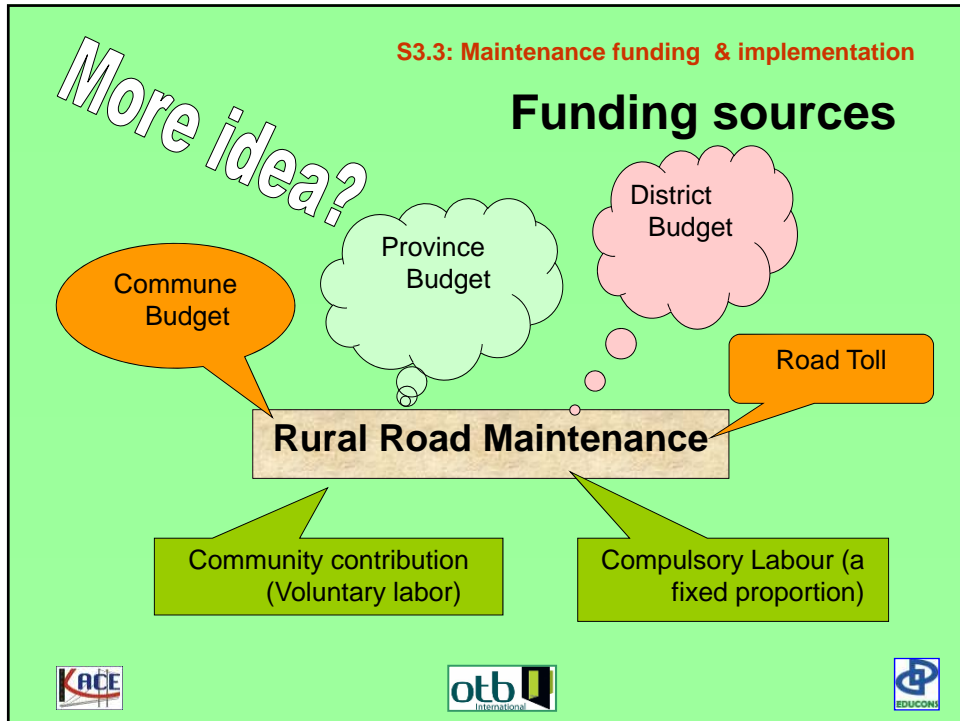
Section 3

S3.3: Maintenance funding & implementation

SUMMARY

- **Funding sources for Rural Road Maintenance; how to choose and mobilize funding resources.**
- **Plans to mobilize funding resources**
- **Models of maintenance implementation**





- ## Funding sources
- ❑ If community leaders and organisations plan effectively, there should be **ENOUGH BUDGET** for Rural Road Maintenance. (?)
 - ❑ With local funding mobilisation, you can **CHOOSE** the appropriate model to implement road maintenance
- KACE
- otb International
- EDUCONS

S3.3: Maintenance funding & implementation

Models for Rural Road Maintenance implementation

- ❑ Large contractors (SOE or Private)
- ❑ Small contractors (Private)
- ❑ Force account (District or commune road maintenance groups)
- ❑ Community group.
- ❑ Length person or Family contract
- ❑ Compulsory/Voluntary labour



S3.3: Maintenance funding & implementation

A proposal of fund mobilization of commune

Commune.....	District.....	Province.....
Funding estimated for road maintenance	Calculating method	Total Amount
1. Funds from Province
2. District Budget
3. Commune Budget
4. Local community's contribution
5.
.....
.....
.....
Total:		



S3.3: Maintenance funding & implementation

Appropriate road maintenance implementation model

Models of road maintenance implementation	Your <i>Commune</i> 's Fund	Possible use e.g. <i>Commune A</i>
1. <i>Large Contractor</i>
2. <i>Small Contractor</i>
3. <i>Fund Administrator</i>
4. <i>Local Community</i>
5. <i>Length person/family contract</i>
6. <i>Compulsory/ Voluntary Labor</i>

