Chapter 5

THE CANE TRUCK OPERATING COSTS (CTOC)

The operating costs of the cane trucks are the primary component of the cane transportation costs, which should be carefully consider as the prime objective for cane business improvement. Generally the cane transportation costs comprise of many cost items, namely loading cost, vehicle operating costs, travel time cost, accident and delay time cost. However, some of these cost items such as accident and delay time costs were very difficult to quantify in monetary term, thus the present study concentrated only to those items which could be valued in monetary quantity. All of these items, the vehicle operating costs share the largest portion. Since, this research attempted to evaluate the actual costs paid by the cane truck owners in order to operate such business, thus the financial cost basis was applied in stead of using an economic cost which neglects the taxes and transfer payments.

In order to evaluate the cane trucks operating costs (CTOC) per ton per kilometre of transported canes, the data from 46 qualified samples and those obtained from field interviews for the production years of 1977-1978 were analysed. These data comprise of loaden weight, distance of travelling on paved and unpaved roads, travel time per trip, fuel consumption rate and maintenance characteristic. Summary of these data are presented in Table 28 The difficulty was the computation of cane trucks operating costs on various road surfaces, since these trucks travelled on both paved and unpaved roads, thus, to avoid such problems, the "Delta L" method explained by KAMPSAX KAMPMAN, KIERULFF & SAXILD A/S (1976) was -

applied. The concept of this method was that the extra distance of about 20 percent increased in the haulage length on the unpaved roads would equivalent to the haulage on the paved one. Thus, the total equivalent paved length would equal to the length of paved section plus 1.20 times length of the unpaved section. Applying this technique, the equivalent round trip distance on paved roads of each sample could be calculated, and the cane trucks operating costs would be computed. Detailed computations and criterias used in the analysis could be explained as follow :

5.1 Component of the Cane Trucks Operating Costs

The cane trucks operating costs could be classified into two main categories; running costs and time costs, the former defined as those costs which change directly with speed, the latter as those costs which change with the utilization of the vehicle, i.e. with the average number of kilometres run per year. The components of running costs are fuel consumption, oil and lubricant, repair and maintenance, tyre and tube, and depreciation costs. The components of time costs are crews, and management overhead costs which include insurance, tax, and net compensation costs. Detailed of each component could be explained as follow:

5.1.1 Running Costs

5.1.1.1 Fuel Consumption Cost (FCC)

Fuel consumption rate of each sample obtained directly from the cane truck drivers interviews. Because cane truck carried full load only the farm to mill trip, but empty load on the return trip, thus, in order to take account of this effect, the fuel consumption rate computed from round trip distance and fuel consumed was adopted instead of that from

any particular trip only. The values range between 1.39-4.69 km per litre depend on characteristics of the haul routes, and vehicle lifes. The average value of 2.58 km per litre was used in the study, this value seemed little below the standard value used by the consultants in the feasibility study in Thailand. This might result from the different in the haul routes and operating characteristics. The financial cost of diesel was 2.56 bahts (based on 1977 price), thus the average cost per km would be 0.9922 baht.

5.1.1.2 Lubricating Oil Cost (LOC)

The lubricating oils should be replaced every 3,000 Kilometres at 10 litres each time, hence, the average rate of 300 km per litre was consumed. Since a wide variety of oils are used in Thailand, a standard type and high-class type, thus, an average value of 22.0 bahts per litre was used as the financial price of oils in the study. This yield the lubricating oils cost of 0.0733 baht per kilometre.

5.1.1.3 Tyre and Tube Cost (TTC)

Tyre size of 825 x 20 x 12 ply, locally produced,were widely used with the average life of 40,000 kilometres of travel. From the interviews, it was found that very few of the cane trucks used retread tyres because very heavy loads were carried together with the poor farm routes condition, therefore, only new tyres were considered as representative of tyre used in this item. The selling price of a new tyre and tube was 2,400 bahts, yielding the tyre and tube cost of 0.60 baht per kilometre.

5.1.1.4 Repair and Maintenance Cost (RMC)

Owing to a wide variety of answers about maintenance cost were obtained from the interviews, hence, the same figures for number of hours of labor and part costs in VALENTINE LAURIE & DAVIES, R.O.P. (1977)

report adopted from De Weille's study were used in calculating repair and maintenance cost. Amount of 9.38 hours of labor costs and 0.063 per cent of financial cost of vehicle for part costs were charged to the maintenance and repair cost per 1,000 kilometres of travel. For the financial cost of 344,800 bahts for a vehicle, and the labor rate of 40 bahts per hour, would give the cost for this item to be at 0.5924 baht per kilometre.

5.1.1.5 Depreciation and Interest Cost (DIC)

In calculating the depreciation and interest cost, the salvage valve has been taken into account, since it was found that most of the cane trucks operated during the study period have the life span between 2-5 years and the service life of about 7 years with the salvage valve of about 60,000 bahts. The depreciation and and interest cost of respective vehicle was then calculated by using the following equation:

$$DIC = (P-L) \ CR + Li$$

where
$$DIC = \text{Depreciation and interest cost;}$$
$$P = \text{Initial cost of vehicle;}$$
$$L = \text{Salvage value of vehicle;}$$
$$CR = \text{Capital recovery factor}$$
$$I = \text{Annual interest rate, 12 percent.}$$

Accepting those figures above, the depreciation and interest cost of the cane trucks would be 69,605 bahts a year. For the annual cane trucks travel distance of about 30,000 kilometres (operating period was 6 months of 30 days / month), therefore, the depreciation and interest costs per kilometre would be 2.3202 bahts per vehicle.

5.1.2   Time Costs

5.1.2.1 Crews Cost (CC)

Occupant time cost or crews cost will be fully charged to the heavy cane trucks based on the assumption that all of these vehicles are in the working mode. Results from site survey showed that occupancy rate per vehicle was 1.5 persons: one driver and a half helper. The average money paid for drivers was about 2,700 baht. This amount included the overtime payment, thus the average rate per day was 90 bahts, and amount of 30 bahts would be paid for the helper. Hence, the crews cost per kilometre was 0.7792 baht per vehicle.

5.1.2,2 Insurance Cost (IC)

The cost of insurance varied from 4,000-10,000 bahts per annum depend on types of insurance, the average value of 7,000 baht was used, therefore, the insurance cost per kilometre was 0.2333 baht.

5.1.2.3 Tax Cost (TC)

The license and fee costs for 10-wheel trucks were about 3,800 bahts per annum, thus the tax cost was 0.1267 baht per kilometre.

5.1.2.4 Duty and Municipal Tax Cost (DMC)

The municipal duties were 0.55 percent of the net receipts. The average value of 100 bahts per ton of cane were charged to the cane owners for cane delivery, thus the average receipt would be 360,000 baht per season (6 months x 30 trips/months x 20 tons/trip x 100 bahts/ton), therefore, the municipal taxes were 1,980.0 bahts per season. This yields the amount of 0.0660 baht per kilometre.

5.1.2.5 Overheads Cost (OC)

The cost of this item were given given at about 5 percent of the total expense of the previous items, which yielded a value of 0.2892 baht per kilometre per vehicle.

5.1.2.6 Net Compensation (NC)

The net compensation costs of about 10 percent of the subtotal cost of all previous items were preferred in this business. Therefore, the total transoprt cost of 6.6798 bahts per kilometre or 0.3400 baht per ton per kilometre of transported cane could be obtained, (based on the average pay loaded of 19.65 Tons per trip).

Summary of the calculated operating costs of 46 qualified samples were given in Table 29

Table 28 Observed Data For CTOC

Sample No.	Pay Loading weight (tons)	Average Travel Distance (Km)		Equivalent Round Trip Distance to Hard Surface (Km)	Average Travel Time (hrs)		Average Fuel Consumption	
		Hard Surface or Paved road	Laterite & Gravel or Unpaved road		Loaded Truck	Unloaded Truck	Lt	Km/ Lt
1	22	72	48	259.2	6	3.5	80	3.24
2	19	60	10	144.0	2.5	2.0	55	2.62
3	21	137	3	281.2	2.0	1.5	60	4.69
4	20	59	11	144.4	2.0	1.5	70	2.06
5	18	73	17	186.8	3.0	2.5	75	2.49
6	16	70	Road Side	140	2.5	1.0	80	1.75
7	20	85	25	230	5.0	2.5	90	2.56
8	20	65	15	166	2.5	1.5	60	2.77
9	20	82	17	204.8	3.0	1.5	70	2.96
10	23	34	21	118.4	2.0	1.5	60	1.97
11	20	38	12	104.8	1.5	0.75	40	2.62
12	18	99	21	248.4	5.0	2.0	75	3.31
13	18	40	30	152.0	4.0	3.0	72	2.11
14	22	48	7	112.8	1.25	0.67	50	2.26
15	18	69	41	236.4	6.0	2.5	90	2.67
16	20	75	45	258.0	2.5-3.0	1.5	80	3.23
17	21	63	7	142.8	2.5	1.5	50	2.86
18	18	53	2	110.8	1.5	1.0	80	1.39
19	18	8	27	80.8	1.0	0.67	30	2.69
20	20	56	7	128.8	4.0	2.0	60	2.15
21	15	29	36	144.4	3.0	2.0	60	2.41
22	18	55	10	134.0	3.0	3.0	70	1.91
23	22	65	65	286.0	4.0-5.0	2.0	80	3.58

Table 28 (Continued) Observed Data For CTOC

Sample No.	Pay Loading weight (tons)	Average Travel Distance (Km)		Equivalent Round Trip Distance to Hard Surface (Km)	Average Travel Time (hrs)		Average Fuel Consumption	
		Hard Surface or Paved road	Laterite & Gravel or Unpaved road		Loaded Truck	Unloaded Truck	Lt	Km / Lt
24	24	40	40	176	3.5	2.0	80	2.20
25	21	68	2	140.8	3.0	2.0	40	3.51
26	18	39	1.	80.4	2.0	1.0	40	2.01
27	20	60	5	140.0	3.0	1.5	50	2.80
28	18	32	16	102.4	2.0	1.0	50	2.05
29	18	50	35	184.0	3.0	1.5-2.0	80	2.30
30	21	115	5	142.0	3.0	1.5	60	2.37
31	20	45	40	186.0	4.0	1.5	70	2.66
32	18	43	37	174.8	2.0	1.0	60	2.91
33	25	68	7.	152.8	1.5	1.0	54	2.83
34	21	17	8	53.2	1.5	0.75	25	2.13
35	20	65	30	202.0	3.0-4.0	2.0	70	2.89
36	16	23	2	50.8	1.0	0.30	17	2.99
37	17	21	4	51.6	1.5	1.0	25	2.06
38	20	73	2	150.8	2.0-3.0	1.0-15	50	3.02
39	23	8	32	92.8	1.5	1.0	40	2.32
40	21	60	5	132.0	2.5-3.0	2.0	80	1.65
41	20	35	30	142.0	3.0	1.5	75	1.89
42	18	48	22	148.8	3.0	1.5	50	2.98
43	18	45	20	134.8	1.5	0.75	40	3.37
44	20	46	4	101.6	1.5	1.0	43	2.36
45	20	48	2	100.8	1.5	1.0	45	2.24
46	20	80	30	232.0	4.0	2.5	80	2.90

$\bar{X}$ = 19.65 Tons

$\Sigma \frac{X}{X}$ = 7,087.2 Km
= 154.07 Km

$\bar{X}$ = 2.58 Km/1

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Table 29 Sugar Cane Truck Operating Cost (CTOC) ฿/Ton/Km, Years 1977-1978

Sample NO.	FCC	LOC	TTC	RMC	DIC	CC	IC	TC	DMC	Sub-Total	OC	Sub-Total	NC	TOTAL.
1	0.03591	0.00333	0.02727	0.0693	0.10546	0.03542	0.01060	0.00576	0.00300	0.25368	0.01268	0.26636	0.02664	0.29300
2	0.05143	0.00386	0.03158	0.03118	0.12212	0.04101	0.01228	0.00667	0.00347	0.30360	0.01518	0.31878	0.03188	0.35066
3	0.02599	0.00349	0.02857	0.02821	0.11049	0.03710	0.01111	0.00603	0.00314	0.25413	0.01270	0.26683	0.02668	0.29351
4	0.06214	0.00367	0.03000	0.02962	0.11601	0.03896	0.01166	0.00634	0.00330	0.30170	0.01508	0.31678	0.03168	0.34846
5	0.05712	0.00407	0.03333	0.03291	0.12890	0.04329	0.01296	0.00704	0.00367	0.32329	0.01616	0.33945	0.03394	0.37339
6	0.09143	0.00458	0.03750	0.03703	0.14501	0.04870	0.01458	0.00792	0.00412	0.39087	0.01954	0.41041	0.04104	0.45145
7	0.05000	0.00367	0.03000	0.02962	0.11601	0.03896	0.01166	0.00634	0.00330	0.28956	0.01447	0.30403	0.03040	0.33443
8	0.04621	0.00367	0.03000	0.02962	0.11601	0.03896	0.01166	0.00634	0.00330	0.28577	0.01428	0.30005	0.03000	0.33005
9	0.04324	0.00367	0.03000	0.02962	0.11601	0.03896	0.01166	0.00634	0.00330	0.28280	0.01414	0.29694	0.02969	0.32663
10	0.05649	0.00319	0.02609	0.02576	0.10088	0.03388	0.01014	0.00551	0.00287	0.26481	0.01324	0.27805	0.02780	0.30585
11	0.04885	0.00367	0.03000	0.02962	0.11601	0.03896	0.01166	0.00634	0.00330	0.28841	0.01442	0.30283	0.03028	0.33311
12	0.04297	0.00407	0.03333	0.03291	0.12890	0.04329	0.01296	0.00704	0.00367	0.30914	0.01545	0.32459	0.03246	0.35705
13	0.06740	0.00407	0.03333	0.03291	0.12890	0.04329	0.01296	0.00704	0.00367	0.33357	0.01667	0.35024	0.03502	0.38526
14	0.05149	0.00333	0.02727	0.02693	0.10546	0.03542	0.01060	0.00576	0.00300	0.26926	0.01346	0.28272	0.02827	0.31099
15	0.05327	0.00407	0.03333	0.03291	0.12890	0.04329	0.01296	0.00704	0.00367	0.31944	0.01597	0.33541	0.03354	0.36895
16	0.03963	0.00367	0.03000	0.02962	0.11601	0.03896	0.01166	0.00634	0.00330	0.27919	0.01395	0.29314	0.02931	0.32245

Table 29 (continued)

Sample NO.	FCC	LOC	TTC	RMC	DIC	CC	IC	TC	DMC	Sub-Total	OC	Sub-Total	NC	TOTAL
17	0.04262	0.00349	0.02857	0.02821	0.11049	0.03710	0.01111	0.00603	0.00314	0.27076	0.01353	0.28429	0.02843	0.31272
18	0.10232	0.00407	0.03333	0.03291	0.12890	0.04329	0.01296	0.00704	0.00367	0.36849	0.01842	0.38691	0.03869	0.42560
19	0.05287	0.00407	0.03333	0.03291	0.12890	0.04329	0.01296	0.00704	0.00367	0.31904	0.01595	0.33499	0.03350	0.36849
20	0.05953	0.00367	0.03000	0.02962	0.11601	0.03896	0.01166	0.00634	0.00330	0.29909	0.01495	0.31404	0.03140	0.34544
21	0.07816	0.00489	0.04000	0.03949	0.15468	0.05195	0.01555	0.00845	0.00440	0.39757	0.01987	0.41744	0.04174	0.45918
22	0.07446	0.00407	0.03333	0.03291	0.12890	0.04329	0.01296	0.00704	0.00367	0.34063	0.01703	0.35766	0.03577	0.39343
23	0.03250	0.00333	0.02727	0.02693	0.10546	0.03542	0.01060	0.00576	0.00300	0.25027	0.01251	0.26278	0.02628	0.28906
24	0.04848	0.00306	0.02500	0.02468	0.09668	0.03247	0.00972	0.00528	0.00275	0.24812	0.01240	0.26052	0.02605	0.28657
25	0.03473	0.00349	0.02857	0.02821	0.11049	0.03710	0.01111	0.00603	0.00314	0.26287	0.01314	0.27601	0.02760	0.30361
26	0.07076	0.00407	0.03333	0.03291	0.12890	0.04329	0.01296	0.00704	0.00367	0.33693	0.01684	0.35377	0.03538	0.38915
27	0.04571	0.00367	0.03000	0.02962	0.11601	0.03896	0.01166	0.00634	0.00330	0.28527	0.01426	0.29953	0.02995	0.32948
28	0.06938	0.00407	0.03333	0.03291	0.12890	0.04329	0.01296	0.00704	0.00367	0.33555	0.01677	0.35232	0.03523	0.38755
29	0.06183	0.00407	0.03333	0.03291	0.12890	0.04329	0.01296	0.00704	0.00367	0.32600	0.01630	0.34230	0.03423	0.37653
30	0.05144	0.00349	0.02857	0.02821	0.11049	0.03710	0.01111	0.00603	0.00314	0.27958	0.01398	0.29356	0.02436	0.32292
31	0.04812	0.00367	0.03000	0.02962	0.11601	0.03896	0.01166	0.00634	0.00330	0.28768	0.01438	0.30296	0.03021	0.33227
32	0.04887	0.00407	0.03333	0.03291	0.12890	0.04329	0.01296	0.00704	0.00367	0.31504	0.01575	0.33075	0.03307	0.36382

Table 29 (continued)

Sample NO.	FCC	LOC	TTC	RMC	DTC	CC	IC	TC	DMC	Sub-Total	OC	Sub-Total	NC	TOTAL
33	0.03618	0.00293	0.02400	0.02370	0.09281	0.03117	0.00933	0.00507	0.00264	0.22783	0.01139	0.23922	0.02392	0.26314
34	0.05723	0.00349	0.02857	0.02821	0.11049	0.03710	0.01111	0.00603	0.00314	0.28537	0.01426	0.29963	0.02996	0.32959
35	0.04429	0.00367	0.03000	0.02962	0.11601	0.03896	0.01166	0.00634	0.00330	0.28285	0.01419	0.29804	0.02980	0.32784
36	0.05351	0.00458	0.03750	0.03702	0.14501	0.04870	0.01458	0.00792	0.00412	0.35294	0.01764	0.37058	0.03706	0.40764
37	0.07310	0.00431	0.03529	0.03485	0.13648	0.04584	0.01372	0.00745	0.00388	0.35492	0.01774	0.37266	0.03727	0.40993
38	0.04238	0.00367	0.03000	0.02962	0.11601	0.03896	0.01166	0.00634	0.00330	0.28194	0.01409	0.29603	0.02960	0.32563
39	0.04798	0.00319	0.02609	0.02576	0.10088	0.03388	0.01014	0.00551	0.00287	0.25630	0.01281	0.26911	0.02691	0.29602
40	0.07388	0.00349	0.02857	0.02821	0.11049	0.03710	0.01111	0.00603	0.00314	0.30202	0.01510	0.31712	0.03171	0.34883
41	0.06772	0.00367	0.03000	0.02962	0.11601	0.03896	0.01166	0.00634	0.00330	0.30728	0.01536	0.32264	0.03226	0.35490
42	0.04772	0.00407	0.03333	0.03291	0.12890	0.04329	0.01296	0.00704	0.00367	0.31389	0.01569	0.32958	0.03296	0.36254
43	0.04220	0.00407	0.03333	0.03291	0.12890	0.04329	0.01296	0.00704	0.00367	0.30837	0.01542	0.32379	0.03238	0.35617
44	0.05423	0.00367	0.03000	0.02962	0.11601	0.03896	0.01166	0.00634	0.00330	0.29379	0.01469	0.30846	0.03085	0.33931
45	0.05714	0.00367	0.03000	0.02962	0.11601	0.03896	0.01166	0.00634	0.00330	0.29670	0.01483	0.31153	0.03115	0.34268
46	0.04414	0.00367	0.03000	0.02962	0.11601	0.03896	0.01166	0.00634	0.00330	0.28370	0.01418	0.29788	0.02979	0.32767