Study of Effectiveness of Road Fund as a Solution for Maintenance Problem in Sri Lanka

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Abstract: *Transportation makes a key contribution to the economic and social development in every country. Among other transportation means roads play a considerable role with the lack of other means like rails, ships and airlines. Well-conditioned roads have many tangible and intangible benefits to all road users. Well-planned maintenance programme is an essential in this regard. There are many causes for not having effective sustainable road maintenance practices. Those are related to management, technology and finance. Among them, inadequate financing is a critical problem. Many countries depend on country's general budget even though it is not adequate. Time to time individual countries and international lending agencies have introduced off-budget financing methods. Road Funds concept was introduced by the World Bank as an off-budget method. In this thesis main purpose is to analyze effectiveness of Second Generation Road Fund and to propose whether it is desirable solution for Sri Lanka road maintenance problem. The Road Funds in developed countries, middle-income countries and developing countries were evaluated separately and final conclusion was drawn according to evaluation results*

Keywords: *Road maintenance, Road Financing, First & Second Generation Road Funds, Effectiveness*

1. INTRODUCTION

Well-conditioned road network in a country brings many tangible and intangible advantages to all road uses. To keep the roads in well-conditioned, a well-planned maintenance programme is an essential. If maintenance of road is not implemented at the right place and right time, it may cause many problems. Many countries do not have well-established maintenance plan. As a leading cause for this problem, it can be high-lighted the institutional related problems. Those are institutional framework, human resource constraints, lack of clearly defined responsibilities, inefficient management structures, weak management systems, and inadequate financing arrangement (Heggie, Ian G. and Piers Vickers,1998).
With the identified problems, for an effective road network, the solution are strengthening the management and financing of road sector. The concept is commercialization: or putting road on fee-for-service basis and managing like a business (Kenneth M. Gwilliam & Zmarak M.Shalizi). To achieve this, reforms should be done to focus on; Establishing responsibility for managing roads by clearly assigning roles, Creating ownership of roads, Strengthening management of roads, Stabilizing road financing. With this background the main purpose of this research is to study existing Road Funds (RFs) and analyse its effectiveness.

2. METHODOLOGY

Literature review was conducted to identify problems with road maintenance financing and for possible solutions. During the literature survey it was understood that Road Fund (RF) is practicing in many developing countries but no effectiveness analysis has been done to date. Then evaluation methods (both qualitative and quantitative) for RF were defined to analyze the effectiveness of implementation of

Road Funds (RFs). The indicators used to measure the quality of (RFs) were categories into three sections namely, structure, process and performance of the RF(World Highways, Vol. 9, No. 7, October 2000 "Second Generation Road Funds: The Way Ahead).
Many countries around the world responded to the growing shortage of finance by attempting to earmark selected road related taxes and charges and depositing them into a special off-budget account, or road fund, to support spending on roads (Mustapa benmaamar). The first introduced mechanism is called as the First generation Road Fund. The mechanism is, levy, duties etc are collected by the relevant ministry and deposited to the Road Fund. Those funds are supposed only to use for road maintenance work. With the deficit of the First generation Road Fund, the Second Generation Road Fund was introduced. Here funds are collected by an independent body and deposited to the Road Fund

Structure

1. Does the structure of the Road Board (RB) introduction of professional management run according to sound business practices? (**S1)**
2. Does the RB have adequate representation of road users and civil societies to encourage better management demand for efficiency and control of monopoly power? **(S2)**
3. Does the RB have a firm legal basis? **(S3)**

Process

4. Adequacy of road financing **(P1)**
5. Share of work outsourced **(P2)**
6. Stability of road financing **(P3)**
7. Performance monitoring **(P4)**

Performance

8. Impact of RF on the quality of road maintenance **(F1)**
9. RF contribution to improved operational efficiency **(F2)**
10. RF impact to improve the capacity of executing agencies.**(F3)**
11. Has the RF improved the allocation?**(F4)**

Quantitative analysis was done using road maintenance expenditure compare to Gross Domestic Product (GDP).

3. RESULTS, DISCUSSION AND CONCLUSION

3.1 Results

Second Generation Road Funds in various countries were qualitatively evaluated under defined indicators and results are shown in **Table 1**.
Using the qualitative method, effectiveness of RF in each country can be evaluated. It cannot be used as a comparison method. Therefore to compare countries, road statistics and Gross Domestic Product (GDP) data are used. It is often helpful to look at the size of the financing plan relative to GDP. Cross country comparison of this indicator can be helpful although they cannot be definitive due to unreliability of data. Evaluation results of quantitative methods are shown in **Table 2** and **Table 3.**

Table 1 Achievement of Object Indicators

Country	S1	S2	S3	P1	P2	P3	P4	F1	F2	F3	F4
Ethiopia	+	-	-	+	-	+	+	+	+	-	-
Benin	+	+	+	+	+	+	+	+	-	-	n.a
Ghana	+	+	+	+	-	+	+	+	+	+	n.a
Zambia	+	+	-	+	+	-	-	+	+	-	-
Kenya		+									
Honduras	+	+	+	n.a	+	+	n.a	n.a	n.a	n.a	n.a
Guatemala	+	+	+	n.a	+	+	n.a	+.	n.a	n.a	n.a

+: there is an improvement after Road Fund establishment, -: there is no improvement even after Road Fund establishment, n.a: no information available

Table 2 Developed countries: Road expenditure on roads as proportion of GDP

		Average of Total Road Expenditure/GDP % (1970-2003)	Average of Maintenance Expenditure/GDP % (1970-2003)	Average of Maintenance Expenditure/GDP % (1990-2003)
Developed Countries with Road Fund	Switzerland	2.20	0.67	0.1
	USA	1.63	0.42	0.25
	New Zealand	1.30	0.65	0.74
	Japan	2.69	0.39	0.36
		Average= 1.96	**0.53**	**0.36**
Developed Countries without Road Fund	Finland	1.23	0.88	0.78
	Germany	1.58	0.16	no data
	Ireland	1.40	0.51	0.21
	Italy	1.55	0.59	0.48
	Denmark	1.47	0.56	0.39
	Spain	0.69	0.18	0.22
	Sweden	1.06	0.61	0.55
	Canada	2.06	0.72	0.27
	Norway	2.25	1.71	0.52
	Korea, Rep	1.70	0.19	0.2
	Australia	1.98	0.54	no data
		Average= 1.54	**0.60**	**0.40**

Source: Road expenditure data are from World Road Statistics, IRF and GDP data from World Bank Statistics

Table 3 Developing and middle income countries: maintenance expenditure on roads as proportion of GDP

		Average of Maintenance Expenditure/GDP % (1970-2003)	Average of Maintenance Expenditure/GDP % (1990-2003)
Developing Countries with Road Fund	Hungary	1.35	0.17
	Latvia	1.44	1.44
	Romania	0.20	0.20
	Ethiopia	0.24	0.14
	Benin	0.25	0.16
	Yemen	1.62	1.86
	Ecuador	0.22	0.22
	Ukraine	0.44	0.44
	Cameroon	0.35	no data
	Madagascar	0.30	no data
	Mali	0.27	no data
		Average= 0.61	**0.58**
Developing Countries without Road Fund	Sri Lanka	0.0569	0.0031
	Pakistan	0.26	0.2254
	Albania	0.0542	0.0542
	Croatia	0.1741	0.1626
	Bolivia	0.5172	0.4833
	Mongolia	0.1344	0.1344
		Average= 0.1995	**0.18**
Middle-income Countries without Road Fund	Thailand	0.21	0.21
	Philippines	0.29	0.14
	Poland	0.52	0.51
	Turkey	0.13	0.13
	Chile	0.20	0.42
	Brazil	0.10	0.014
	Hong Kong	0.49	0.52
	Malaysia	0.36	no data
	Argentina	0.13	no data
	Mexico	0.15	0.13
		Average= 0.26	**0.26**

Source: Road expenditure data are from World Road Statistics, IRF and GDP data from World Bank Statistics

3.2 Conclusions and Recommendations

Even though First Generation RF was established to ensure stable and adequate financing, still it is under the Ministry of Finance. So Ministry of Finance can use it as its general budget. Agency model RB is not a financing mechanism. Post-war RFs are similar to Second Generation RF and performing well. There is a trend in developing countries to practise Second Generation RF.

RF to be more effective following proposals can be given.

(i) Fuel levy should be set up to meet road expenditure.

(ii) Direct transfer of revenue from petroleum enterprises to RF is the most desirable way.

(iii) Resource allocation should not be based on 'standard formula' but according to necessity.

(iv) Surplus of RF can lead to many criticisms by other sectors. This should be considered when setting fuel levy.

Considering quantitative analysis, road spending is increasing with increasing GDP for developed countries and middle income countries. It does not show significance of road fund on maintenance expenditures. For developing countries there is no clear relationship between maintenance expenditures and GDP. But average of spending on maintenance as a proportion of GDP is high in developing countries with RF than that of without RF. According to the analysis, the countries having good road networks are spending 0.36% of countries GDP value for countries with Road Fund and 0.40% of countries GDP value for countries without Road Funds. Considering these results and road conditions, RF should be able to spend at least about 0.4% of country's GDP value.

Finally it can be concluded that establishment of a RF is effective in every countries but RF alone cannot take all responsibilities to improve the road sector at the initial stage. With parallel to stabilizing financial arrangement, other problems related to management of road sector also should be addressed with establishing responsibility for managing roads.

It is very clear that inadequate financing for maintenance is a critical problem faced by Sri Lanka. Spending on road maintenance is about 0.0031% as proportion of country's GDP in Sri Lanka. With the deficit budgetary arrangement, it is hard to achieve money from the general budget. Therefore it is essential to look for an off-budget financing method.

4. ACKNOWLEDGEMENTS

Without the guidance and encouragement of many well-meaning people , this research might not be a successful one. Therefore it is my duty to express my sincere gratitude for their support. First I would like to express my heartfelt gratitude to my academic supervisor, Associate professor Takashi MATSUMOTO for his grate teaching, guidance and comments throughout my research. Also my thanks go to Professor, Hideyuki HORII, Associate Professor Kazumasa OZAWA for giving their suggestions and encouragements to improve my research. Also I would specially thank to Mr. MBS Fernando, chairman, RDA, Sri Lanka, Mr. AM Jawzi. Director, Maintenance and Management Division, RDA, Sri Lanka and Mr. Nimal Chandrasiri, Director RDA Sri Lanka for giving their kind hands to collect necessary information. Finally I would express my gratitude to all those who help me to complete this research successfully.

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