COST-BENEFIT ANALYSIS OF PROPOSED GODAGAMA DEVELOPMENT NODE UNDER THE GREATER MATARA DEVELOPMENT PLANNING PROGRAM

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ABSTRACT

Cost-benefit analysis is an essential tool of modern project management to measure the economic value as well as its aesthetic, cultural and social acceptance of the program. In this study, it is intended to examine how cost-benefit analysis can be applied successfully to spatial planning in development. The study area chosen is the southern town of Matara and a cost-benefit analysis is performed to assess the benefits that would accrue if the Township was developed under a proposed project. A special feature of this study would be the linking of the spatial planning project with the cost benefit-analysis, which is a novel approach but one that has rarely been discussed in the relevant literature. According to the result of the analysis, this project would cost LKR 717.93 Million. It is certain that if the funds are allocated, the project can be implemented successfully.

Key Words: Cost-Benefit Analysis, Development Project, Township Management, Urban Planning, Project Management

Introduction

A cost-benefit analysis (CBA) is usually performed to identify the most effective and economic way to conduct a transaction, engage in an activity, implement a project or accomplish a mission when there are several alternative ways of setting about it. The purpose of the analysis is to help

determine the best approach that would yield the desired results while keeping the costs as low as possible (David, Dube, & Ngulube, 2013). The CBA, also referred to as benefit-cost analysis (BCA) makes use of a systematic process for working out the costs of following a given approach or policy and weighing it against the benefits. The approach that can provide the most benefits for the least cost is then chosen for implementation. Both governments and organizations depend on cost-benefit analysis to help them decide on the best option before launching a major undertaking.

Cost-benefit analyses serve two important purposes: They can provide a good indication of the soundness of an investment or a decision. They can justify same by showing that the overall benefits are more than worth the costs and to what extent.

They make it possible to compare different approaches to implementing a given program by providing rough estimates of the total cost of each option and the benefits available from each option (Mishan & Quah, 2007).

Cost-benefit analysis is not the same thing as other types of investment analysis. In CBA, costs and benefits are assessed in terms of money value and this includes corrections made for the time value of money. The value of benefits realized and the value of money invested in the venture over time are calculated to give their Net Present Value (NPV). There are various other types of investment or project analyses such as, cost-effectiveness analysis, cost–utility analysis, risk–benefit analysis, economic impact analysis, fiscal impact analysis, and social return on investment (SROI) analysis. Therefore, the analytic technique employed for quantifying the risks and benefits of programs and projects over a given period of time (Pearce, Atkinson, & Mourato, 2006), must use the same process to make comparisons valid (De Groot, Alkemade, Braat, Hein, & Willemen, 2010). In contrast to the present value (PV) method of investment appraisal, CBA makes use of the net present value (NPV) method by excluding the investment and returns (Lohmann, 2009). Though mostly used for performing financial analysis, CBA is also used for other purposes. It is frequently employed to work out environmental and social costs versus benefits of projects whenever these can be quantified with an acceptable degree of accuracy (Boardman & Boardman, 2008).

The Greater Matara Urban Area [GMUA]

Matara is a coastal town located in the Southern Province of Sri Lanka, with a resident population of 71,000 and a day time population of 100,000. It had a low population density of 43 persons per hectare in 2001. It has few landmarks, a low building density and not much traffic congestion. The growth rate is presently 0.8%. Though Matara was elevated to Municipal Council status in 2003 the people in the central and outer areas still do not receive proper municipal services due to the weak administration (Amerasinghe & d'Auria, 2007).

The Greater Matara Urban Area [GMUA] was constituted in 2001 by the Urban Development Authority (UDA). It comprises Matara, Thihagoda, Malimbada, Welipitiya, Weligama, Godagama and Devinuwara. This area is of a partly urban but mostly rural character with a population of 268,000, and an average density of 15 persons per hectare. The GMUA was declared as an Urban Development Area by the UDA under the UDA Law in 2005, and its development is guided according to this authority's plan (UDA, 1978). The draft of the development plan identifies seven major development projects as shown on Figure 1.
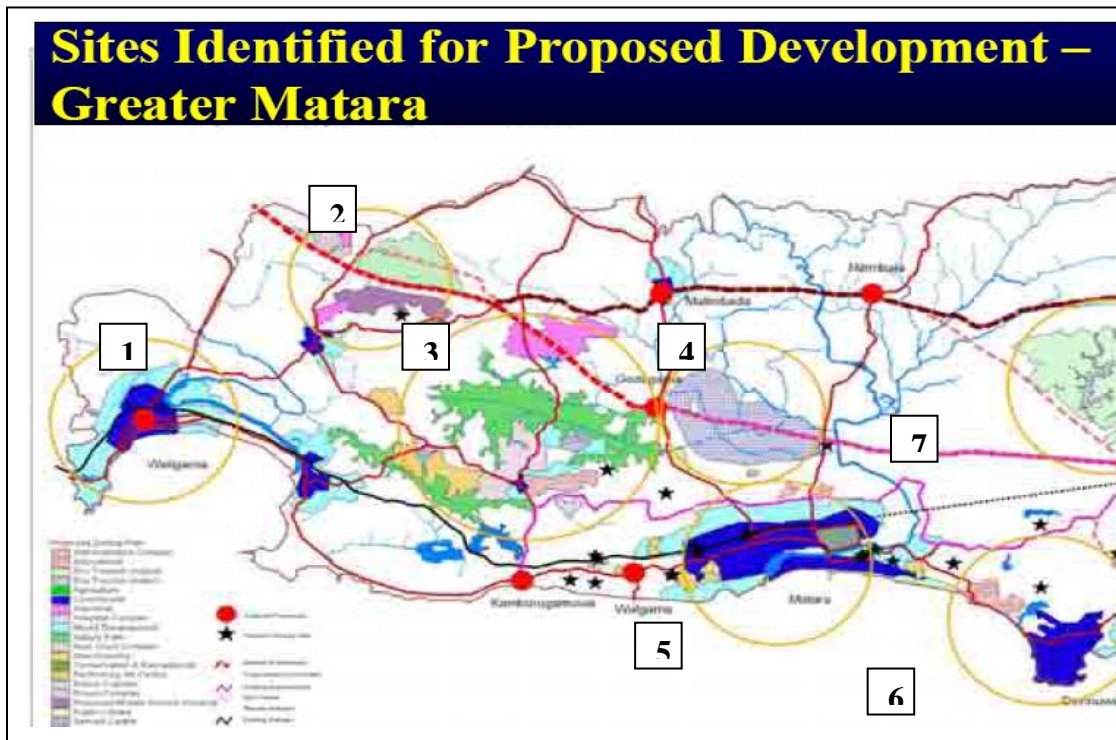

Figure 1: Seven Major Development Projects in Greater Matara Region

(Source: Urban Development Plan, Matara)

The seven major development projects centered on the Main Node of Greater Matara are:

1. Weligama - Commercial

    Commercial Complex, Bus Stand, Fisheries, Recreational, Tourism

2. Sports & Housing

    Commercial Complex, Bus Stand, Fisheries, Recreational, Tourism

3. Godagama – Institutional

    Administrative Complex, Courts Complex, Health, Police, Industrial Park

4. Environmental

    Eco-tourism, Water Recreational

5. Matara - Commercial

    Market Complex, Archaeological Conservation, Beach Park, Town Hall,

    Housing & Tourism

6. Devinuwara - Educational

    IT Campus, Fisheries Harbor, Tourism

7. Environmental

    Eco-tourism

Study Area: Godagama - New Urban Center Development Area

For this assignment the Number 3 project of the above program has been chosen to perform a cost-benefit analysis. Number three project consists of,

  • Hospital Complex

  • Administrative Complex

  • Courts & Prison Complexes

  • Multimodal Transport Center (rail, road and water)

  • Shopping Arcades

  • Kiralakele Wetland Conservation Park

  • City Lake and Nature Trail

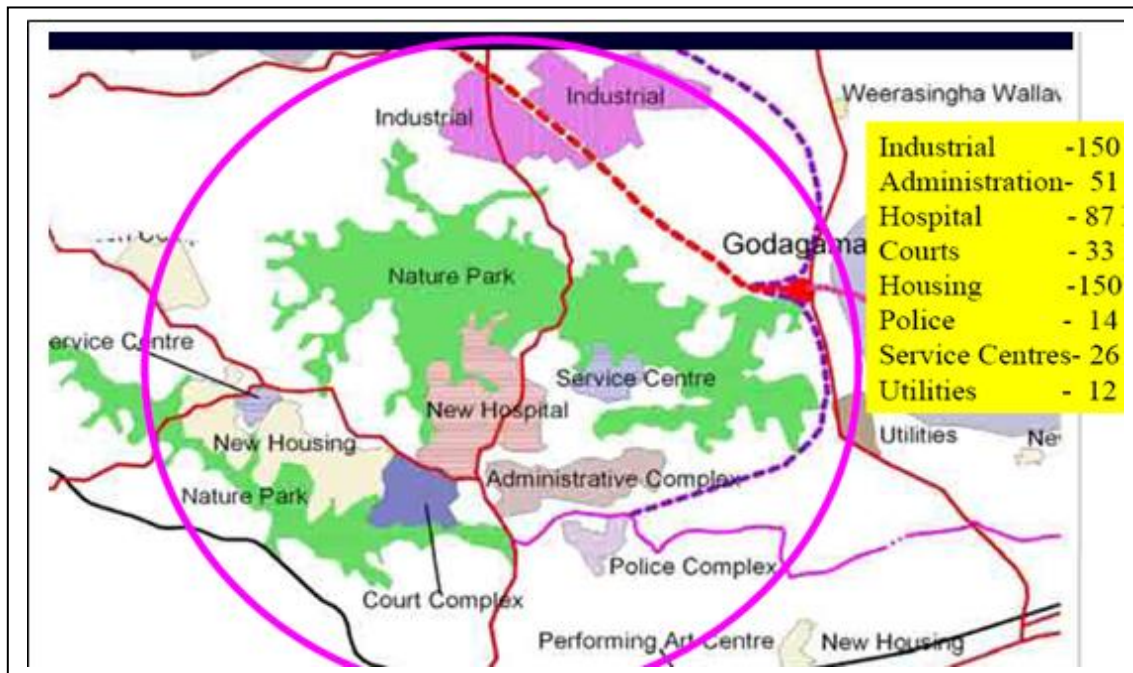 • Police Complex

  • Sports Village

Figure 2: Godagama Development Node, Project Are

Objectives of project

"To set Matara in an advantageous position by transforming it into an important economic hub of the South by moving its non-commercial activities into the **Godagama Node,** and to utilize the land in the Greater Matara Urban Region for the most productive economic activities by implementing a futuristic renewal program."

Methodology

The first stage of the project is devoted to implementing five components of the program. Cost and benefit data were collected for this purpose from the concerned authorities and officers and tabulated as indicated in Table 1.

Table 1: Summary of Costs and Benefits over the Project Period

Stages	Cost Items	Cost in Rs M	Benefit Items	Benefit in Rs Million
1	Acquisition		Land Value	
	Land Acquisition	2,000.00		9,600.00
	Resettlement	2,500.00		
2	Site Preparation	750.00	Economic Benefit	2,000.00
3	Layout Designing			
	Survey Plan	100.00	Aesthetic Value	2,000.00
	Architectural Design	150.00		
4	Construction			
	Basic Infrastructure	3,500.00		
	General Construction		Construction Value:	
	Hospital	820.00	Economic Benefit	8,000.00
	Administrative Secretariat	122.00	Life Style	5,750.00
	Courts	184.00	Peace & Calm	4,600.00
	Police	352.00	Annual Revenue	7,500.00
	Town Hall	115.00		
	Industrial Park (under construction)	1,000.00		
	Prison	552.00		
	Other	1,000.00		
5	Operational	2,000.00	Employment Opportunity	4,100.00
	Total	**15,145.00**		**43,550.00**

Project Cost

Table 2 indicates the operational costs of the project while it was being implemented during the period 2005 to 2009. A 20% discount was applied when calculating the costs.

Table 2: Cash Outflow of Project (Project Cost)

STAGE	YEAR	ACTIVITY	INVESTMENT	DISCOUNT FACTOR (R=20%)
	Year 0 (2004-12-31)			
Stage One		Acquisition		
		Land Acquisition	2000.00	2000.00
		Resettlement	2500.00	2500.00
	Year 1 (2005-12-31)			
Stage Two		Site Preparation	750.00	625.00
	Year 2 (2006-12-31)			
Stage Three		Layout Designing		
		Survey Plan	100.00	69.44
		Architectural Design	150.00	104.17
	Year 3 (2007-12-31)			
Stage Four		Construction		
		Basic Infrastructure	3500.00	2025.46
		General Construction Works		
		Hospital	820.00	474.54
		Adm. Secretariat	122.00	70.60
		Courts	184.00	106.48
		Police	352.00	203.70
		Town Hall	115.00	66.55
		Industrial Park (under construction)	1000.00	578.70
		Prison	552.00	319.44
		Others	1000.00	578.70
Stage Five	Year 4 (2008-12-31)			
		Operational Cost	1000.00	482.25
	Year 5			

	(2009-12-31)			
		Operational Cost	1000.00	401.88
			15,145.00	**10,606.93**

Present value (PV) of cost for each activity $\dfrac{V}{(1+R)^N}$ is shown in the final

column of Table 2. Total PV of Cost is $\displaystyle\sum_{N=0}^{Q}\dfrac{C}{(1+R)^N}$ = Rs. 10,606.93 Million

Project Benefit

Table 3 indicates the cash inflow during the project period and the benefits realized after the project. Interest of 20% is applied on the estimate of each item until the year 2014.

Table 3: Total Cash Inflow of Project

Year	Activity	Benefit	Discount Factor (R=20%)
Year 0 : 2004-12-31			
	Employment Opportunity	200	200.00
Year 1 : 2005-12-31			
	Land Value	200	166.67
	Employment Opportunity	300	250.00
Year 2 : 2006-12-31			
	Land Value	250	173.61
	Employment Opportunity	400	277.78
Year 3 : 2007-12-31			
	Land Value	300	173.61
	Employment Opportunity	500	289.35
Year 4 : 2008-12-31			
	Land Value	350	168.79
	Employment Opportunity	600	289.35
Year 5 : 2009-12-31			

	Land Value	400	160.75
	Employment Opportunity	700	281.31
Year 6 : 2010-12-31			
	Land Value	800	267.92
	Employment Opportunity	1400	468.86
	Economic Benefit	1000	334.90
	Life Style	500	167.45
	Peace & Calm	200	66.98
	Annual Revenue	500	167.45
	Aesthetic Value	2000	669.80
Year 7 : 2011-12-31			
	Land Value	1600	446.53
	Economic Benefit	1500	418.62
	Life Style	750	209.31
	Peace & Calm	400	111.63
	Annual Revenue	1000	279.08
Year 8 : 2012-12-31			
	Land Value	1800	418.62
	Economic Benefit	2000	465.14
	Life Style	1000	232.57
	Peace & Calm	800	186.05
	Annual Revenue	1500	348.85
Year 9 : 2013-12-31			
	Land Value	1900	368.23
	Economic Benefit	2500	484.52
	Life Style	1500	290.71
	Peace & Calm	1600	310.09
	Annual Revenue	2000	387.61
Year 10 : 2014-12-31			
	Land Value	2000	323.01
	Economic Benefit	3000	484.52
	Life Style	2000	323.01
	Peace & Calm	1600	258.41
	Annual Revenue	2500	403.76
	Total	**43,550**	**11,324.86**

Present value (PV) of benefit from each activity $\dfrac{V}{(1+R)^N}$ is shown in the final

column of Table 3. Total PV of benefits is $\displaystyle\sum_{N=0}^{P}\dfrac{B}{(1+R)^N}$ = Rs. 11,324.86 Million

Cost and Benefit of Project

Hence, $\text{NPV} = \displaystyle\sum_{N=0}^{P}\dfrac{B}{(1+R)^N} - \sum_{N=0}^{Q}\dfrac{C}{(1+R)^N}$

= 11,324.86 – 10,606.93

= Rs. 717.93 Million

Therefore, this project should be accepted because NPV > 0.

Where,

R = Interest, N = Number of years, V = Value

Assumptions: Interest Rate is 20% throughout project period

No failures or difficulties in implementing project

Project starts around 2005-12-31 and is completed by 2009-12-31

Benefits realized by 2014 -12-31

Note: Value of this project has been estimated in tentative manner.

Conclusion

The start date and speed of implementation of project is dependent on the availability of funds. The cost-benefit analysis takes into consideration not only the economic aspects of the project

but also other facets like social justice, environmental impact and aesthetic value, etc. In fact, there are positive indications that over the period from 2004 to 2014 much in the way of social and environmental benefits have resulted from the project. The full benefits of the program will be felt by the residents of the area from the year 2014. The value of benefits realized in the year 2014 was Rs. 717.93 Million, but the value of benefits will keep increasing steadily every year if the project features are utilized optimally by those managing it. If some of the marshy lands in the area are filled and reclaimed that will open up more space for many public facilities that will help serve the people better. Thus, even more benefits will be realized.

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