Proceedings of the Eastern Asia Society for Transportation Studies, Vol. 5, pp. 2211 - 2218, 2005

ASSESSMENT OF LOCAL ECONOMIC CONDITIONS DUE TO ROAD BETTERMENT PROGRAM (CASE STUDY: KABUPATEN PASURUAN, EAST JAVA, INDONESIA)

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Abstract: This research was conducted on Kabupaten Pasuruan, East Java, Indonesia. The objectives of this present research are to evaluate the comparison of inhabitant's income and Road User Cost before and after road betterment project. The local inhabitant perception due to the road betterment project was also investigated. This research shows that the increment of local inhabitant's income generated more economic activities along the road; and that the economic benefit resulted from income augmentation is much greater than those from road user cost saving. The road betterment program resulted in the increment of local inhabitant's income associated to the increase of economic activities and the decrease of fuel consumptions. The local inhabitants working on the industrial and agricultural sectors pointed out that the reduction of freight transportation travel time for raw material and production resulted in the increase of their earnings. Those working on the local trading sectors indicated that their activities are increased which at last generate more income.

Key words: road betterment program, inhabitant's income, local economic activities, economic benefit, road user cost.

1. INTRODUCTION

1.1. Background

One of the most crucial problems in Indonesia is road transport and the necessity to improve the road transport network. The main purpose of road betterment program is to improve the accessibility of transportation (either for freight and passenger), local economic and social-cultural conditions. Improvement of local economics due to a road betterment project has never been assessed in Indonesia. The road user cost saving is the only benefit, which normally considered for road betterment program. Applying conventional Cost-Benefit Analysis which mainly considers traffic benefit seems to be inadequate for road betterment program evaluation for local road with low traffic volume in developing countries. The road investment evaluation needs to be an integrated approach which taking into account other consideration such as socioeconomic impacts, environmental impacts, etc. (Pholsena et al, 2003).

In order to be able to achieve the comprehensive approach study on the assessment of local economic conditions due to road betterment program had been carried out. This research was conducted on Kabupaten Pasuruan, East Java, Indonesia. The main objectives of this present

research are to evaluate the comparison of inhabitant's income and Road User Cost before and after road betterment project. The local inhabitant perception due to the road betterment project was also investigated in order to better understand their opinion.

1.2. Economic Benefit Analysis

To support future feasibility decision on transportation infrastructure construction investment, the accuracy of benefit evaluation should be paid an increasing attention. Especially in Indonesia to evaluate the road improvement project for roads having low traffic volume. Suprayitno (2004) had classified economic benefit analysis into four basic categories: Operational Income, Road User Cost Saving, Economic Activities on site and Economic Activities on the influenced area in the long run. Further on, based on the above economic benefit characteristics, it can be classified into direct or indirect classification, and short term or long term classification as presented in Table 1.

Table1. Economic Benefit classification

Classification	Short Term	Long Term
Direct	Operational Income	Operational Income
Indirect	On site Economic Activities	Long Run Economic Development

2. DATA COLLECTION

2.1 Location of the Study

This research was conducted in Pasuruan Regency, East Java, Indonesia during the fiscal year of 2000. The road network is shown in Figure 1. Three road sections indicated by dashed area on the map: Mangkrengan – Lekok, Jatiarjo – Watuagung and Pandaan – Randupitu, had been thoroughly and meticulously observed and investigated, before and after road betterment program.

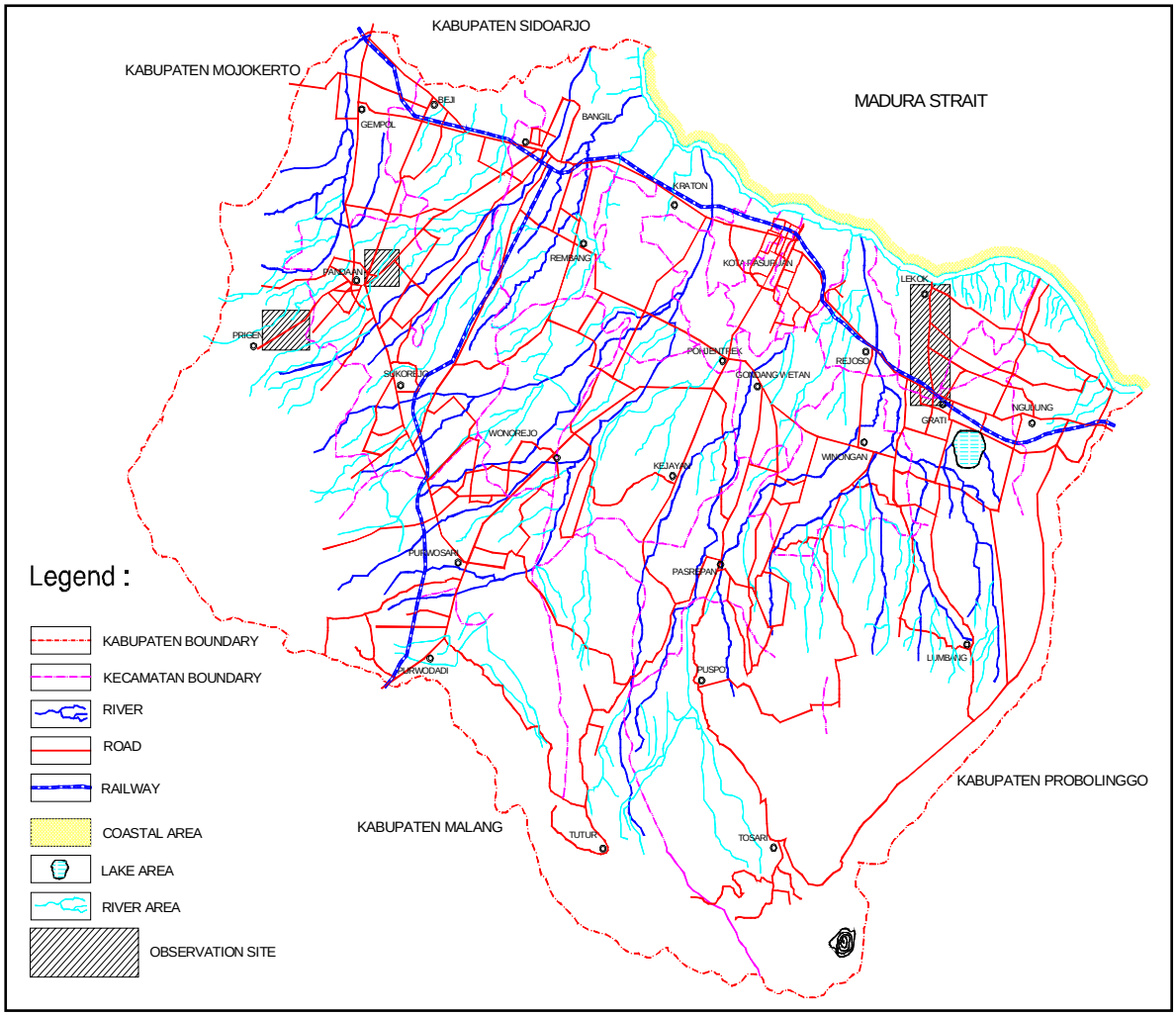

Figure 1. Location of the study

2.2 Road Condition and Economic Activities

The road betterment construction cost and condition, ADT (Average Daily Traffic), pavement condition and economic activities of three road sections: Mangkrengan – Lekok, Jatiarjo – Watuagung and Pandaan – Randupitu are shown in Table 1, Table 2, Table 3 and Table 4 respectively.

Table 2. Road Betterment Construction Cost and Condition

No	Road Section	Width *(m)*	Length *(m)*	Construction. Cost *(Rp)*
1	Mangkrengan - Lekok	6.00	6000	300.000.000
2	Jatirejo - Watuagung	5.50	6630	450.000.000
3	Pandaan - Randupitu	6.00	5800	329.004.000

Source: Amanah (2003)

Table 3. Average Daily Traffic (ADT)

No	Road	1999	2001	2002	Augmentation	
		pcu	*pcu*	*pcu*	1999-2001	1999-2002
1	Mangkrengan - Lekok	546	584	612	38	66
2	Jatirejo - Watuagung	820	920	989	100	169
3	Pandaan - Randupitu	2733	2941	3162	208	429
	Total	4099	4445	4763	346	664

Source: Amanah (2003)

Table 4. Pavement Condition

No	Road Section	1999		2001		2002	
		Type	Cond.	Type	Cond.	Type	Cond.
1	Mangkrengan - Lekok	asphalt	medium	asphalt	good	hotmix	good
2	Jatirejo - Watuagung	asphalt	good	hotmix	good	hotmix	good
3	Pandaan - Randupitu	asphalt	good	hotmix	good	hotmix	good

Source: Amanah (2003)

Table 5. Economic Activities

No	Road Section	Industry	Local Trade	Agriculture
1	Mangkrengan - Lekok	wooden box, brick, tofu, furniture, rice snack crackers, cigarette.	building material, grocery store	paddy, corn
2	Jatirejo - Watuagung	wooden craft	Food stall, telephone stall, fruit stall	Paddy, soy - bean
3	Pandaan - Randupitu	furniture, snack, tofu	Food stall, telephone stall, grocery store	paddy

Source: Amanah (2003)

2.3 Road Betterment Project Perception

How a road betterment program affects property values and life quality improvement are essential to the people. The local inhabitant perception due to the road betterment project was also investigated in order to better understand their opinion. The questionnaires were distributed to local inhabitants working on the industrial, agricultural and local trading sectors along the corridor of three sections subjected to road betterment program. Five different aspects (shorter travel time for raw material and production, increment of production, traffic augmentation, land value augmentation and public facilities accessibility) were investigated to better understand the impact of road betterment program to the industrial, agricultural and local trading sectors. The five aspects were ranked and valued from 5 (least significance) to 1 (most significance) according to the degree of the aspect's importance. Table 6 presents the road betterment project perception.

Table 6. Road Betterment Project Perception

No.	Kind of Impact	Sector		
		Agricultural	Trading	Industrial
1	Shorter travel time for raw material and production	1	3	1
2	Production increase	3	2	2
3	Increment of traffic	2	1	3
4	Increase of land price	4	4	4
5	Better accessibility to publics facilities	5	5	5

Source: Amanah (2003)

3. DATA ANALYSIS

Economic Benefit was calculated for one year observation. The Road User Cost Reduction was calculated before and after road betterment completion; only Vehicle Operating Cost (using Indonesian model developed by Bina Marga) is considered. The inhabitant's income augmentation is determined based on economic activities before and after the road betterment project. Income for each condition is basically the difference between inhabitant's earnings and expenditures.

3.1. Road User Cost Saving

Road User Cost saving had been investigated for four different categories of road user. The result is presented in Table 7.

Table 7. Road User Cost Saving

No	Sector	Road User Cost			Difference	
		1999 *rupiah*	2001 *rupiah*	2002 *rupiah*	1999-2001 *rupiah*	1999-2002 *rupiah*
1	Industrial	962,276.46	887,560.56	920,166.56	-74,715.90	-42,109.90
2	Trading	1,555,465.56	1,401,625.68	1,548,396.68	-153,839.88	-7,068.88
3	Agricultural	7,743,493.47	6,313,649.39	6,489,131.15	-1,429,844.08	-1,254,362.32
4	Local Inhabitants	1,652,196.38	1,616,478.29	1,632,628.60	-35,718.09	-19,567.78
	Total	11,913,431.67	10,219,313.92	10,590,322.99	-1,694,117.95	-1,323,108.88
	%				-14.22	-11.11

The percentages of the difference of Road User Cost Saving of the year 1999 to 2001 and of the year 199 to 2002 were determined based on the Table 7 above and presented in the Table 8. The difference of Road User Cost Saving was less in the year 2002: this fact was related to the traffic volume increment from the year 2001 to 2002. The traffic volume increment

resulted in the decrease of travel speed and therefore effected on the decrease of Road User Cost Saving.

Table 8. Percentage of Road User Cost Saving

No	Sector	1999-2001		1999-2002	
		Difference (rup)	Difference %	Difference (rup)	Difference %
1	Industrial	-74,715.90	4.41	-42,109.90	3.18
2	Trading	-153,839.88	9.08	-7,068.88	0.53
3	Agricultural	-1,429,844.08	84.40	-1,254,362.32	94.80
4	Common People	-35,718.09	2.11	-19,567.78	1.48
	Total	-1,694,117.95	100.00	-1,323,108.88	100.00

It can be clearly noted that the agricultural sector possessed the most Road User Cost Saving comparing to other sector.

3.2. Income Augmentation of Local Economy Activities

The income augmentation was investigated for three different sectors. The income for the year 1999, 2001 and 2002 together with the income augmentation is presented in the Table 9 below.

Table 9. Income Augmentation of Local Economy Activities

No	Sector	Income			Income Augmentation	
		1999 *rupiah*	2001 *rupiah*	2002 *rupiah*	2001 *rupiah*	2002 *rupiah*
1	Industrial	268,200,000	350,712,000	375,996,000	82,512,000	107,796,000
2	Trading	347,937,641	461,025,734	507,768,000	113,088,093	159,830,359
3	Agricultural	0	0	0	0	0
	Total	616,137,641	811,737,734	883,764,000	195,600,093	267,626,359
	%				31.75	43.44

The percentage of the income augmentation was determined based on the Table 9 above and presented in the Table 10. The percentage of income augmentation was bigger in the year 2002. The difference income augmentation between the industrial and trading sector was not significance.

Table 10. Percentage Distribution of Income Augmentation

No	Sector	1999-2001		1999-2002	
		Augmentation	%	Augmentation	%
1	Industry	82,512,000	42.18	107,796,000	40.28
2	Trade	113,088,093	57.82	159,830,359	59.72
3	Agriculture	0	0.00	0	0.00
	Total	195,600,093	100.00	267,626,359	100.00

3.4. Road Betterment Project Perception

The result in Table 6 shows that the degree of importance varies for different sectors. Shorter travel time for raw material and production was the most important factor for agricultural and industrial sector; while the increment of traffic was the most important factor for trading sector associated to the factor which may generate more clients for business along the road.

3.5 Comparison of Economic Benefit

A final comparison had been carried out to investigate the different benefit proportion between Road User Cost Saving and Income Augmentation of Local Economy Activities. The result is presented in Table 11. An interesting point is that the benefit of Income Augmentation is much greater than those of the Road User Cost Saving.

Table 11. Comparison of Economic Benefit

No	Benefit Type	1999-2001		1999-2002	
		Augmentation	%	Augmentation	%
1	Road User Cost Saving	1,694,117.95	0.86	1,323,108.88	0.49
2	Income Augmentation	195,600,093.00	99.14	267,626,359.00	99.51
	Total	197,294,210.95	100.00	268,949,467.88	100.00

3. CONCLUSIONS

An important remark should be made upon findings that the increment of local inhabitant's income generated more economic activities along the road; and that the economic benefit resulted from income augmentation is much greater than those from road user cost saving.

This research shows that road betterment program resulted in the increment of local inhabitant's income associated to the increase of economic activities and the decrease of fuel consumptions. The local inhabitants working on the industrial and agricultural sectors pointed out that since the travel time of freight transportation for raw material and production is becoming less time consuming after the road betterment construction, their activities are augmented, resulted in the increase of their earnings. Those working on the local trading sectors indicated that their activities are increased ever since the transportation cost getting cheaper and more accessible, which at last generate more income.

Understanding these findings above, this present research should be developed and elaborated to these following subjects: development of income augmentation model and long term economic benefit road project for the greater influenced area.

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