

PAPER 3

IMPACT ASSESSMENT OF **LBT PARTICIPATION** ON LOCAL PEOPLE IN TANZANIA

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ABSTRACT

Labour-based technology (LBT) can create a number of job opportunities. In general, more job opportunities contribute to an increase in the household income, and consequently, improve the living standards of participants in the LBT project. However, there has been no research conducted to assess the impact of LBT participation on the local people at a village level in Tanzania. This study aims to evaluate the impact of participation on the local people through a comparison between the participants and the non-participants of one specific LBT project in Tanzania.

A field survey was conducted in the Mbeya region of southwest Tanzania where the LBT road reconstruction project was implemented in the Mbozi district. The results revealed that the local people living in the proximity of the road have a positive impression of the LBT because they recognize that LBT participation has improved their living standards. Subsequently, the impact of LBT participation was clarified quantitatively through a multiple regression analysis. The dependent variables used in the multiple regression analysis were income and expenditure per head. The result shows that the coefficient of the LBT participation dummy variable is negative, which means that the participants basically have a lower income/expenditure than the non-participants. This result can be interpreted to signify that the LBT participants were relatively poor compared to the non-participants.

Keywords: *Labour-based technology, impact, living standards, road reconstruction, Tanzania*

INTRODUCTION

Labour-based technology (LBT) is a construction technology that maximizes the utilization of the labour force to create employment. It finds application in the construction of small-scale infrastructure projects, such as feeder roads or irrigation canals, in developing countries. Such applications of LBT create job opportunities. More job opportunities contribute to an increase in the household income, and consequently, improve the living standards of the participants in the LBT project. In addition to employment creation, LBT has various benefits, such as low construction cost and utilization of local resources.

The government of Tanzania introduced a policy to promote LBT in road construction in rural areas. Hanaoka et al. (2010) revealed the effectiveness of and the problems associated with LBT in Tanzania, based on the natural and social conditions. However, there is no research that has assessed the impact of LBT participation on the local people at a village level in Tanzania. This study aims to evaluate the impact of participation on local people through a comparison between the participants and the nonparticipants of one specific LBT project in Tanzania.

METHODOLOGY

In order to obtain data of a household's living standards near a LBT project site, we carried out a field survey in Vwawa village in the Mbeya region, Tanzania, from January 12–25, 2011. In this village, a 1-km-long feeder road was reconstructed using LBT in two months, from the beginning of October to the end of November, 2010. Local people were employed as labourers at a basic daily wage of 2.67 USD (4,000 Tanzanian Shilling (TZS)) for women and 3.33 USD (5,000 TZS) for men [1USD= 1500 TZS]. For comparison, we distributed questionnaire sheets among the LBT participants as well as the non-participants. We employed a Tanzanian

surveyor and distributed 50 questionnaire sheets (25 for each group). Although 47 sheets were collected, some of them contained invalid answers. Thus, only 27 samples (responses of 11 participants and 16 nonparticipants) were valid.

In order to clarify the differences in income and expenditure between participants and non-participants, we performed a multiple regression analysis with income and expenditure as dependent variables. Household attributes, such as number of household members, age of the household head, and LBT participation dummy variable were independent variables (see Table 1).

Table 1: Definitions of variables

Variables	Definition (Unit)
Dependent variables	
E	Monthly expenditure per head (TZS)
I	Monthly per head (TZS)
Independent variables	
family	No. of household members
Fem	Female-headed household dummy (1:female)
Age	Age of the household head
Edu	High-educated household head dummy (1:high education)
work	No. of workers in the household
farm	Non-farmer dummy (1:non-farmer)
land	Area of owned land (acre)
LBT	LBT participation dummy (1:participant)

RESULTS

Figure 1 shows how the labourers spent their wages obtained for the work done in the LBT. More than 90% of the respondents purchased food. Other common purchases were clothes and farm equipments. Participants spent their wages mainly for their basic needs; however, they also purchased goods such as farm equipment and livestock. This spending can be considered to be investment and wealth accumulation. Some respondents

replied as having spent part of their wages to pay for school fees for their children.

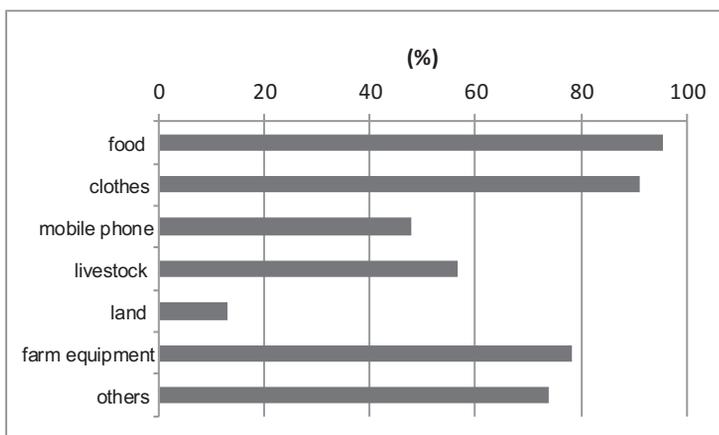


Figure 1: Expenditure by an LBT participant

All respondents answered “Yes” to the question “Would you like to participate if another LBT project is initiated?” The reasons for motivation for participation in the LBT are categorized in Figure 2. “Improvement of life” and “development of the community” are the dominant reasons, rather than “employment creation” and “income generation.”

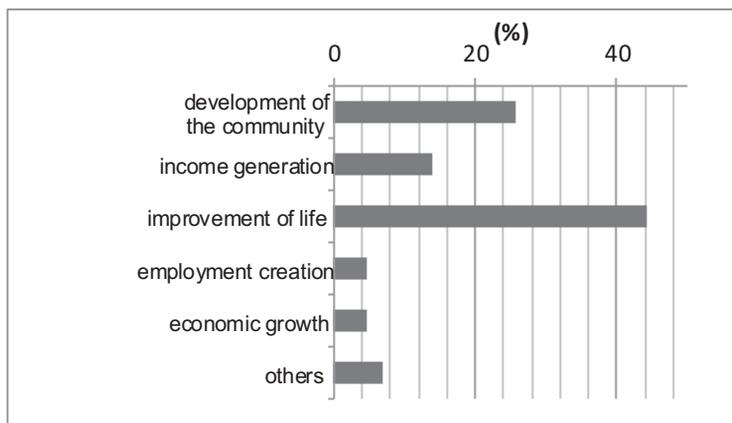


Figure 2: Reasons for participating in LBT

Household attributes are shown in Figures 3 to 7. According to these figures, the LBT participants tend to have a smaller family size, a younger household head, more workers, and less owned land than the nonparticipants. It is notable that more than half of the participant households are female-headed, and there is not much difference between the participants and the nonparticipants in terms of their occupation and education; that is, most respondents are farmers and are not highly educated.

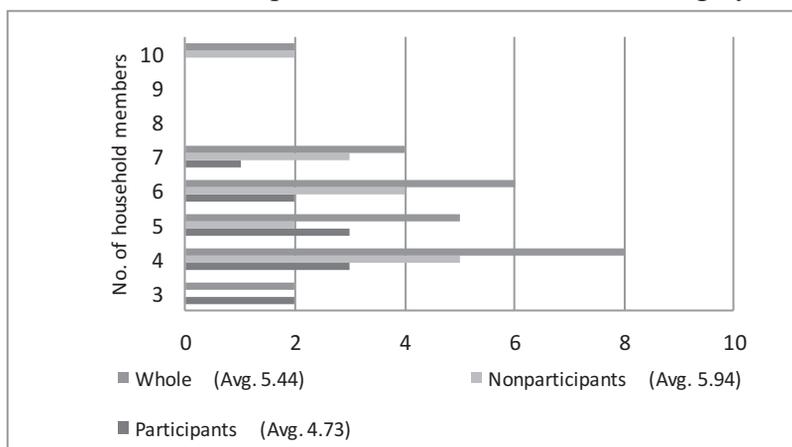


Figure 3: No. of household members

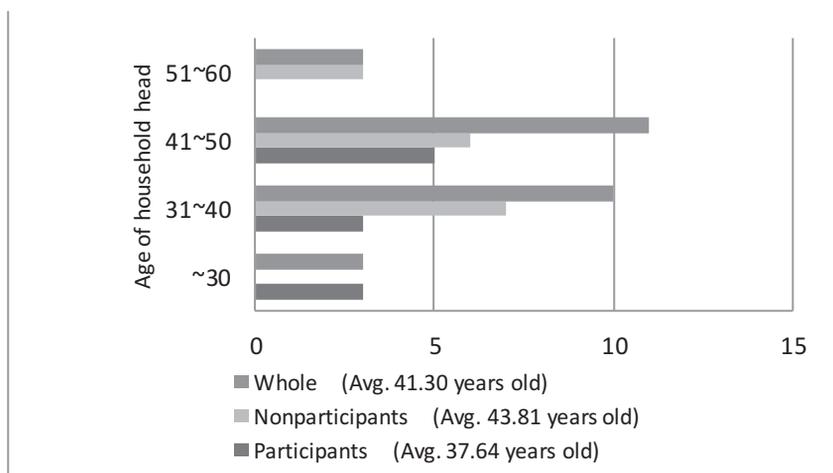


Figure 4: Age of household head

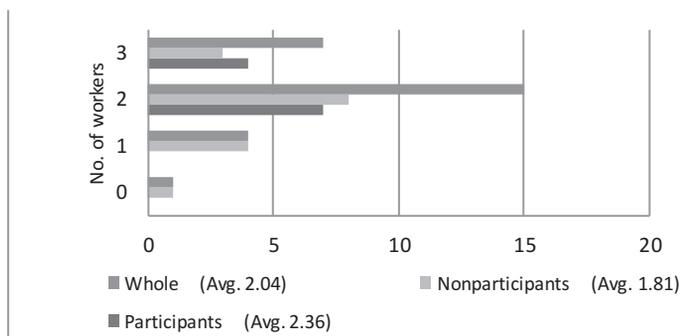


Figure 5: No. of workers

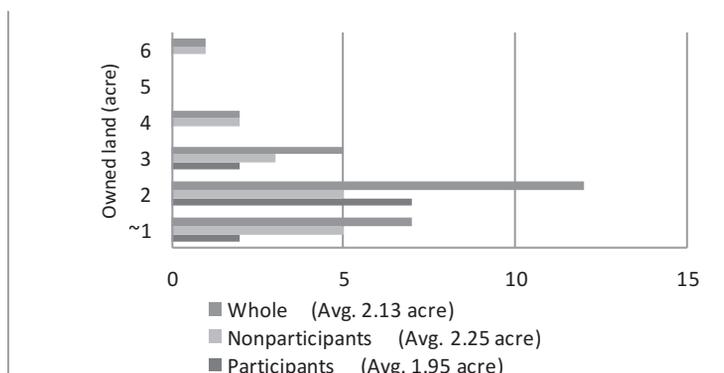


Figure 6: Area of owned land

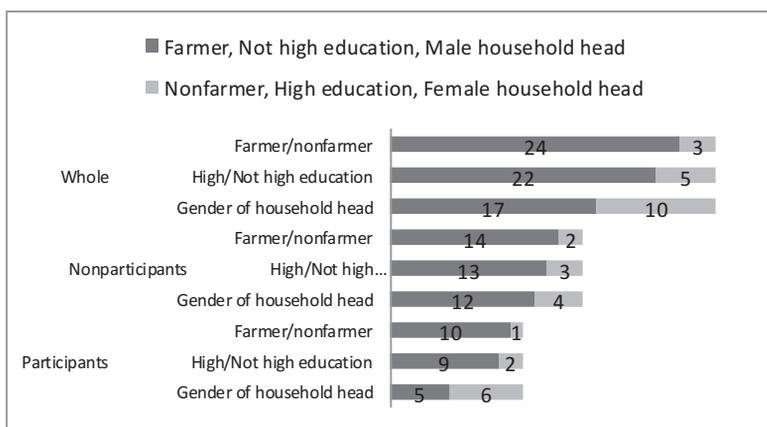


Figure 7: Farmer, Highly educated and Female headed household

Table 2 shows the monthly income and expenditure per head for the respondents. The average expenditure of the participants is approximately 1.2 USD higher than that of the nonparticipants; however, the incomes of the participants and the nonparticipants are almost the same. The level of income/expenditure of the respondents seems slightly below the average Tanzanian expenditure figure, which is 10.95 USD/month/head in rural areas, according to the National Bureau of Statistics, Tanzania (2008).

Table 2: Monthly expenditure and income per head

Item		No. of Samples	Max	Min	Ave	Std. Deviation
Monthly expenditure per head (Unit:USD)	Whole	27	20.90	3.02	8.24	4.38
	Participants	11	20.90	5.22	8.96	5.26
	Nonparticipants	16	16.67	3.02	7.75	3.77
Monthly income per head (Unit:USD)	Whole	27	16.67	3.50	7.83	3.61
	Participants	11	14.68	3.84	7.77	3.59
	Nonparticipants	16	16.67	3.50	7.87	3.73

Prior to the regression analysis, correlation analysis was performed, and its result is shown in Table 3. Overall, the independent variables are not highly correlated with each other. The largest absolute value of the correlation coefficient among the independent variables is 0.509 (work and land). The second largest value is 0.419 (family and land). Therefore, multicollinearity is not significant in this study.

Table 3: Correlation matrix

	family	fem	age	edu	work	farm	land	LBT	I	E
family	1.000									
fem	-0.282	1.000								
age	0.118	-0.231	1.000							
edu	-0.285	0.029	0.106	1.000						
work	0.016	-0.038	0.102	0.232	1.000					
farm	-0.090	-0.271	-0.106	0.135	-0.176	1.000				
land	0.419	0.073	0.241	0.254	0.509	-0.317	1.000			
LBT	-0.340	0.301	-0.398	-0.007	0.364	-0.053	-0.115	1.000		
I	-0.516	0.283	-0.476	0.361	0.044	0.257	-0.216	0.138	1.000	
E	-0.286	0.072	-0.396	0.327	0.024	0.398	-0.087	-0.014	0.846	1.000

The result of the regression analysis is shown in Table 4. The dependent variable in models I-1 and I-2 is monthly income per head, while in models E-1 and E-2, it is monthly expenditure per head. I-1 and E-1 contain all eight variables collected by the field survey. Model I-1 is 1% significant in F-test, but the significant independent variables are only age and the LBT participation dummy variable, as determined by t-test. On the other hand, model E-1 is 10% significant and its significant independent variables are age and farm size.

Table 4: Model Results

Model I-1				Model E-1			
Variables	Coefficients	Beta Coefficients	t-Value	Variables	Coefficients	Beta Coefficients	t-Value
family	-1371.64	-0.372	-1.865	family	-835.72	-0.275	-1.165
fem	3183.00	0.238	1.379	fem	957.22	0.087	0.425
age	-451.04	-0.534	-3.243***	age	-359.81	-0.517	-2.652**
edu	4067.94	0.245	1.422	edu	2543.83	0.186	0.912
work	2697.74	0.311	1.526	work	1561.16	0.219	0.905
farm	3745.60	0.182	1.132	farm	5930.03	0.351	1.838*
land	-801.34	-0.156	-0.682	land	226.65	0.54	0.198
LBT	-5148.70	-0.392	-2.005*	LBT	-4243.491	-0.393	-1.694
R square		0.642		R square		0.496	
Adjusted R square		0.483		Adjusted R square		0.273	
F-Value		4.031***		F-Value		2.219*	
Model I-2				Model E-2			
Variables	Coefficients	Beta Coefficients	t-Value	Variables	Coefficients	Beta Coefficients	t-Value
family	-1991.10	-0.540	-3.400***	family	-1025.97	-0.338	-1.813*
age	-431.90	-0.511	-3.140***	age	-336.47	-0.484	-2.532***
LBT	-3266.97	-0.249	-1.448	LBT	-3469.93	-0.321	-1.591
R square		0.487		R square		0.293	
Adjusted R square		0.420		Adjusted R square		0.201	
F-Value		7.283***		F-Value		3.449**	

LBT participation dummy variable is insignificant. To improve and simplify the models, some insignificant variables were removed one by one, which resulted in the models I-2 and E-2. In these models, all variables have negative coefficients, and the LBT participation dummy variable is insignificant. The coefficients of the LBT participation dummy variable are negative throughout all models. The interpretation of these regression results is that a smaller family, a younger household head, and non LBT

participants are likely to have larger income and expenditure.

DISCUSSION

The average expenditure of the participants is higher than that of the nonparticipants by about 1.2 USD. However, this does not mean that most participants have a higher income than the nonparticipants. Figure 8 shows that most participants, except two outliers, are located at relatively low income and expenditure levels, while nonparticipants are located in a wide range from low to high.

The income level of the participants is comparatively low because the labourers employed in this project were those who were interested in LBT participation and were selected by the community leaders. It is believed that people, particularly young people, without an avenue for earning cash income were preferentially selected. Here, subsistence agriculture was not considered as a job providing cash income and the people engaged in it were prioritized as labourers in LBT.

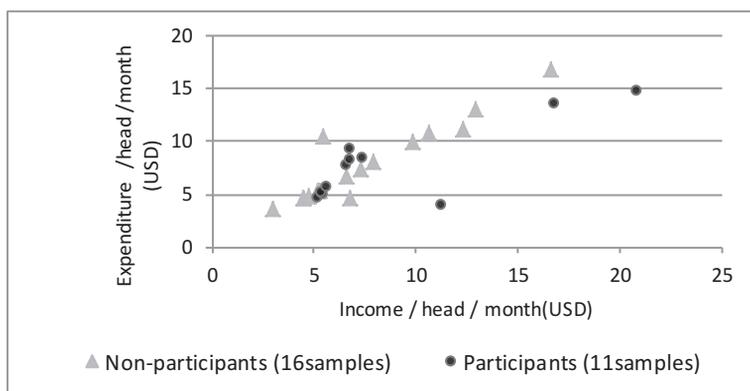


Figure 8: Distribution of Income and Expenditure

Before conducting the regression analysis, we expected that LBT would have resulted in an increase in the income and expenditure of the

participants; however, participants have reported overall lower income/expenditure than those of the nonparticipants. In addition, the R square value is not high enough. Thus, these models are inadequate to explain the participants' income and expenditure. One interesting result is that a remarkable difference between the income and the expenditure of the participants was not observed, regardless of the high wage of LBT when compared to the average income of the respondents. The daily wage provided in this LBT was 2.67-3.33 USD, which is equivalent to approximately one third of the average monthly income per head. For example, according to a record of construction, male and female workers received an average of 78.42 USD and 55.76 USD, respectively, in the month of October. We can say that this is an extremely high extra income for local people.

A woman managing a local shop near the LBT project road mentioned an increase in sales by approximately 20% as a result of the project. This is a good example of how LBT can create income opportunities and how spending by labourers can stimulate the local economy.

CONCLUSION

In this research, we analyzed a few tendencies of the LBT participants and the nonparticipants, and the differences between them in terms of their incomes and expenditures, and other household attributes. This was achieved by conducting a field survey at Vwawa village in the Mbeya region, Tanzania. Responses to the survey indicated how local people evaluated the benefits of LBT. For a quantitative analysis, a more sophisticated method is required to clarify the impact of LBT on the income and expenditure of the participants.

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