

IMPACT OF PUBLIC ROAD INVESTMENT ON POVERTY ALLEVIATION IN RURAL LAOS

Bounmy Inthakesone and Taejong KIM***

Abstract: Rural roads have been widely known as champion for poverty alleviation instruments. Connecting to roads provides market access opportunities, develop market linkage, and improve farm production through technology improvement. This circulation ensures a stable income; later improve living standard and then poverty reduction. In Laos, road networks are extremely poor, many districts lack roads linked to the main national transportation. The paper will find out the mechanism of how the rural roads could contribute to the improvement of household livelihood, and standard of living. Difference in Differences (DD) method will be used in this analysis. The results confirm that the villages with road access may increase their total income around 14.9% compared to the ones without road access, and the result consistent with previous study as well. The recommendation for government to curbe the poverty in Laos is to incorporate the connecting rural road plan into the national development strategy to allow the rural communities to have easy access to the main infrastructure and to be mainstreamed into the country economy to improve their daily activities and their livelihood.

Keywords: Public Investment, Rural Road, Poverty Reduction, Difference in Differences

1. INTRODUCTION

Recently, rural roads have been widely known as champion for poverty alleviation instruments by the World Bank and donor institutions. Rural roads provide substantial benefits to households in low-income countries, especially the poorest. It is also the key to raising living standard in poor rural areas (van de Walle, 2002).The close link between village connecting roads and poverty reduction has been addressed for long term through the increase of income opportunities to rural people. In general, the rural connection roads provide market access opportunities to rural people especially the farmers. They can develop market linkage with other

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stakeholders in the economy. The development market linkage, in other word, network development helps them diversify their income source as they have linked with more variety and functional livelihood value chain system. Through this, they can earn more income with stable sources. When their income improves, their farming production also improved through the increase of opportunity to improve technology and other those relevant to their farming. This circulation ensures a stable income; improve living standard and that reduction of poverty (Oraboune, 2008).

In Laos, many districts lack the roads linked to the main national transportation. Moreover, a good number of villages have yet to be connected to the main district of provincial roads. Thus, the economic growth is obstructed and poverty persists. Rural road improvement and development are poverty alleviation in itself, and it is also a source for the creation of an enabling environment for a market economy (Oraboune, 2008). However, the connecting roads to villages as to provide the rural people with opportunities to have easy access to the markets and gradually to improve their living standard would be pointless unless they understand the objectives of such infrastructure benefits and profit their advantages. That said, due to the budget constraint to construct all connecting roads for every single village around the country will never be realized. Furthermore, the rural villagers, the main stakeholders, with their understanding of the vital need of the rural roads that can improve their livelihood and reduce poverty, should participate in the initiation of the provision of rural access roads and ensure the sustainability of the road maintenance.

The government of Laos recognizes that the absence of transportation infrastructure is a substantial cause of poverty, especially for rural and remote areas. Therefore, there is heavy public investment in basic infrastructures, particularly road network nationwide with high expectation of the Lao government to bring the country of out poverty by 2015 and break away from the least-developed country status in 2020. This chapter tries to answer the main questions of what is the impact of road investment on rural household income, and what happens to other factors that influence rural household income such as rice product, cultivated areas, and other economic activities. More precisely, the paper will find out the mechanism of how the rural roads could contribute to the improvement of household livelihood, and to the increase of household income.

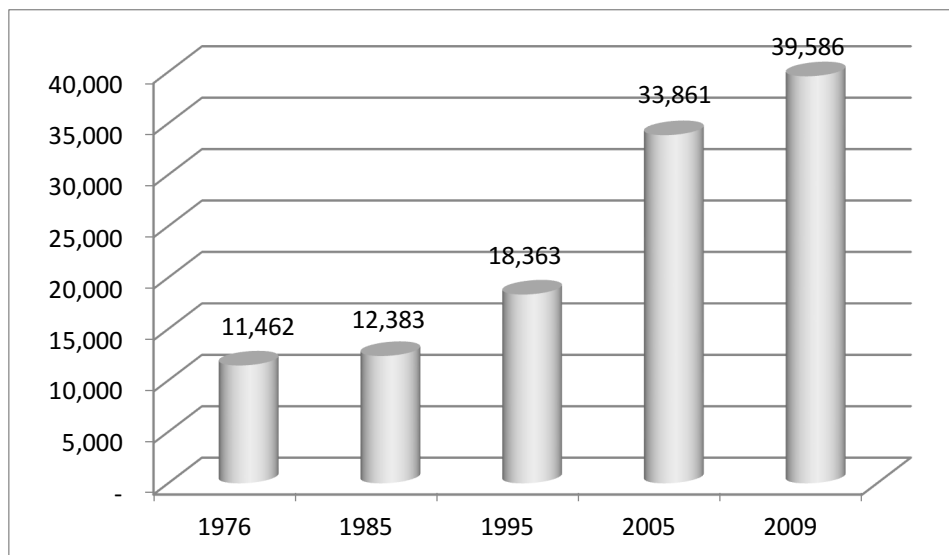
2. OVERVIEW OF ROAD SECTOR IN LAOS

Laos implemented opened-door policy in 1986, since then road is one of the most developed sectors and play a key role for economic development of the

country. Laos is the land-locked country where is no way out to the open-sea. Consequently cargo is a bit complicated comparing with other surrounding countries like Cambodia, China, Myanmar, Thailand and Vietnam. To breakthrough this barrier, the Lao government adopted and introduced a new policy with the aim of converting the country from being landlocked to a land link country. Therefore, surface transportation is considered to be the most economic efficient option comparing to other mode of transportation of the country, especially in this era of international economic integration and regional cooperation. Overall, the total length of road is 39,586 Km with only about 14 percent paved and total area of the country is 236,800 square Kilometers. This make up the road density is about 0.17 (WDI, 2013). However, this ratio is relatively low comparing to other neighboring countries like Cambodia is 0.22(2009), China is 0.42 (2010), Thailand is 0.35 (), Vietnam is 0.48 (2007), excluding Myanmar is 0.05 (2010).

2.1 Road sector development in Laos (1976 - 2009)

After liberalization in 1975, the government of Laos has paid close attention to the development of the country in overall dimension especially infrastructure that is a key for economic development of the country, more specifically after 1986 when the government launched the New Economic Mechanism (NEW), infrastructure both hardware and software have gradually developed with quantity and quality supporting to the development of socio-economic of the country as a whole. The main mode of transportation in Laos is travelling by road. Hence, the development of road network always has been a critical issue for the country especially the expansion of roads in rural and remote areas. In the beginning of 1980s, the road network was in a very poor condition and further deteriorated due to the lack of funding and appropriate maintenance (Alberto Nagales, 2004). After the implementation of the NEW, road network has gradually been developed and expanded all over the country. The Ministry of Communication, Transport, Post and Construction (MCTPC) is responsible for the planning, budgeting, and development of this type of infrastructure network including roads, inland waterways, ports, railways and aviation and airports. Under the government development policy, the MCTPC has carried out the development of road expansion across the country. In 2009, the total length of the road in Laos is 39,568 km, an increase from only 33,861 km and 18,363 km in 2005 and 1995, respectively. (see Figure 1). According to the statistic 2009, the entire road network in Laos was about 39,586 km, but only about 13.7% of total roads are paved, and the rest is either in gravel or earthen surfaces.

Figure 1: Total length Road in Laos (1976-2009)

Source: MPWT, 2009

Road expenditures are financed from general budgetary allocations, foreign loans, and grants. Road sector revenues are derived from sales and import duties on vehicles, spare parts, tires, and automotive fuel products, as well as annual vehicles license fees, vehicle registration, inspection fees, and driver's license fees. In current Lao Kip terms, annual road sector expenditures for construction, operation, and maintenance have been increasing in recent years. This overall increase was mostly due to increase in expenditures funded from external sources (Alberto Nogales, 2004). In 2001, the government decided to establish the Road Maintenance Fund (RMF) and Road Fund Advisory Board in order to be responsible for road maintenance fund mobilization. The RMF provides an enhanced and sustained source for financing the maintenance of the national road network. Since 2002, the RMF has been operated and experienced positively well especially after the government approved and established the fuel levy and others surcharges in January 2001. The RMF has played the main tool for fund mobilization including inflows of funds from donors or board. In the main time, the RMF also benefit from the proceeds of levy on gasoline and diesel fuel, a heavy vehicle surcharge, fines and penalties, and any road tolls and in near future will also benefit from international transit charges, etc. As defined by its regulation, about 90% of the RMF proceeds will finance the maintenance cost of the national roads, and the rest will go to provincial and other lower level of roads.

The development of infrastructure development during this period has shown significant improve and contribute to transportation sector of the country. The development of road, bridge, waterway airway, etc., has supported the development of other sectors including agriculture, commerce as it eases market access.

To sum up, road sector in Laos has dramatically improved in the last three decades, but many areas are still needed to be further developed in order to contribute to social and economic development of Laos.

2.2 Road Characteristic in Laos

Roads in Laos have been classified into six categories, national road, provincial road, district road, urban road, rural road and special road

National Roads: The road network classified as strategic roads which are very important for the development of national economy and wider region, including connections between the national capital, province and special zone capitals; roads to international borders; and roads of socio-economic or defense security importance. Currently, the MPWT is directly responsible for the development of national roads in the whole country. The Development of Roads of the Ministry has developed strategic plan for national roads of the country in concurrence with the national land-link strategy.

Provincial Roads: The connected roads between provincial capitals and district centers, river port, tourist and important historic sites of the province. The provincial Department of Public Works and Transport (DPWT) in each province is responsible for the development of strategic plan for construction and implementation of those relevant to provincial road issues, in respect to the strategy issues by the MPWT. Currently, there are 17 provinces in Laos and each province is responsible for the development of provincial roads to connect at least provincial capital to all district capitals in the province. However, due to the capacity of local officers, the Department of Roads of the MPWT still plays crucial role in assistance all provinces in the country in terms of development of road sector in each province.

District Roads: The inter-district roads in order to connect the district centers to villages, river ports, tourist and historic sites and special economic zones of the district. Currently, there are 141 districts in Laos. According to public administration system of the country, district is the administration level under provincial level. District has classified as the lowest level of public administration organ. Under district, there are villages as autonomous level of people. Office of Public Work and Transportation (OPWT) of the

district is responsible for the development of district roads. Due to the real situation of the country, especially in mountainous and remote areas district roads are often in not very well condition.

Urban Roads: The roads within urban areas. Due to level of infrastructure development in Laos is still low, there are not so many areas considered as urban. Currently, only few areas have been classified as urban including Vientiane Capital, Savannakhet, Champasack and Louangprabang province. Since the structure of urban administrative body has not clear been developed and unified. Often, provincial Department of Public Works and Transport is still responsible for the issues regarding roads and transportation of relevant areas.

Rural Roads: the roads that connect a village to others villages, to the main road accessing to markets, or to connect related production or service to particular centers. Due to the real situation of rural roads dominant of the country and most of poor people live in rural areas. Rural roads have been considered very important and play significant role in poverty reduction through linking rural farming to market, improve their productivity and increase income level. A constraint for rural road construction is budget these public goods in Laos are mainly provided by the government, where the budget would mainly allocate to more economic strategic roads at national level. Majority of rural roads in Laos are earth surface and often non-all weather roads. Especially in rural remote areas, only dry season that the roads are able to commute and not for wet season. This situation by more or less reduces rural farming productivity to access to stable income and that poverty.

Special Roads: The roads that use for special purposes of production or service to particular activities, for national security, and in forest preservation zones. Generally, special roads can be classified into two categories. One is special in terms of economic aspect; and the other is in terms of security reasons:

Economic special roads are economic strategic roads that support the development of potential industries of the country. For example, roads number 9 can also be classified as special road. This road is the regional road (East-West Economic Corridor) of the Great Mekong Sub-region (GMS), where the country can economically gain from.

Security roads are the roads in the areas where related to national security, non-traditional security issues such as forest preservation zones, and so on.

2.3 Government policy regarding road sector in Laos

Due to the recognition of the significant of road sector as an importance means to shore up market system of the country, the government of Laos always emphasizes the development of the road infrastructure as a key for country development. With recognition of the obstacle of the country location “land-locked” situation, which put tremendous constraint for economic development of the country especially high cost of transportation that reduces competitiveness of export sector of the country. Together of the trend of regional development and an effort to overcome this difficulty, the government of Laos has introduced a “land-link” strategy as a tool to catch up regional opportunity pushing industrialization and modernization of the country. Land-link strategy is a strategy to develop the country as bridging land to neighboring countries. This will not only improve opportunity of market access of the country, but the country would also gain from the development of the related industries in concurrence with road sector development. In order to achieve the said strategy, the Ministry of Public Works and transport (MPWT) introduced development plan to 2010, and the road/ transportation was noted that *“develop and expand national roads which are sub-regional and link between the north to the south, and from the east to the west, complete construction of paved roads in Vientiane Capital, which link with municipal areas to district in the provinces and focal development areas must be ensured to use in both seasons”* (Orabune, 2008)

3. METHODOLOGY AND DATA COLLECTION

3.1 Data Collection

The data used in this chapter is taken from the Lao Expenditure and Consumption Survey (LECS). Actually, 5 waves of LECS were carried out, but this study is going to use only LECS 3(2003) and LECS4 (2008). There are a total of 540 villages and 518 villages in LECS3 and LECS4, respectively. The matching of the two waves results in 506 villages and out of 506 only 119 villages are without road access as can be seen in LECS3; then the number in LECS3 was matched against that of LECS4. As a result, 51 villages with road access are in LECS4 are considered as treatment group and the other 68 villages with no road access are used as comparison group.

3.2 Research Methodology

The current study tries to use a suitable comparator, which is defined as comparison of various outcomes before and after road project, in comparison

with or without projects. Difference-in Differences (DD) method will be used in this analysis. The main assumption of this method, if the two groups receive no intervention, the change in values of the outcomes between treatment and control groups should be comparable. The following is the Difference-in Differences in Econometric Model:

$$Y_{it} = \beta_0 + \beta_1 \text{after}_t + \beta_2 \text{treat}_i + \delta_1 \text{treat}_i * \text{after}_t + \beta_3 X_{it} + u_{it}$$

Y_{it} indicates the outcome of interest such as rice farm income, non-farm income and total income, total rice product, yield, cultivated areas of household i in year t .

$After = 1$ after treatment (2008), and 0 before treatment (2003)

$Treat = 1$ if in treatment group, and 0 if in control group

X_{it} is a vector which captures household and village characteristics such as age of head of household, family size, and so on.

u_{it} is an error representing unobserved factors that affects Y_{it}

The coefficient of interest is on the interaction term, δ_1 . This gives us the difference-in-differences estimator of the treatment effect.

This paper will test the hypothesis by each outcome variable which is considered as the main variable influencing rural household income such as income from farm, non-farm income and other factors that could be a source of income such as rice product, yield or cultivated areas and so forth.

The hypotheses to be tested are investment in road infrastructure with significant impact on rice farm income, non-farm income and total income. Other hypotheses to be tested in this chapter are the investment in the road infrastructure with significant impact on rice production and yield and cultivated areas. To test the null hypotheses, the investment in road infrastructure, have no significant impact on rice production and yield, and cultivated areas.

4. RESULTS AND DISCUSSION

Difference-in-Differences methodology is used to obtain all results in this section by running equation (1) to confirm that Difference-in-Differences method meets its main assumption mentioned in the methodology part. This section begins with the baseline of road project survey in 2003.

The table 2 shows the mean of outcome variables in the baseline survey for a group of villages that do have road project (treatment group) and a group of villages that do not have road project (control group). All outcome

variables in treatment group and control group are slightly different. However, they are not statistically significant, indicating that overall there is no statistically significant difference in the mean of outcome variables between treatment and control group in the baseline survey or without intervention of road project, and the mean of outcome variables in both group are comparable which supports the main assumption of the Different-in-Differences method.

Table 1.
Comparison Mean of outcome variables in the baseline survey (2003)

<i>Outcome variables</i>	<i>Treatment group</i>	<i>Control group</i>
Log rice farm income	11.86	12.00
Log non-farm income	14.24	14.28
Log total income	14.49	14.42
Log total rice product	7.43	7.46
Log yield	7.31	7.37
Log cultivated areas	0.12	0.10
HH using tractor	0.07	0.10
HH using fertilizer	0.12	0.11

Source: Reproduced by the Author

The table 2 shows the results of Different-in-Differences estimated by pooled OLS of the effect on log of rice farm income without control variables. The result in table 2 indicates that the coefficient of interest is 0.348 with a positive sign and statistically significant. This empirical result illustrates that villages with road access may increase rice farm income around 34.8% compared to the one without such infrastructure. The result is also in line with the hypothesis of the investment in road infrastructure with significant impact on rice farm income.

Table 2.
Difference-in-Difference estimation of the effect on log of rice farm income

	<i>Treatment Group</i>	<i>Control Group</i>	<i>Difference</i>
Before	14.239 (0.064)	14.279 (0.046)	-0.04 (0.079)
After	15.514 (0.081)	15.206 (0.072)	0.308*** (0.108)
Difference	1.275	0.927	0.348*** (0.134)
observations	599	599	599

Note: before=2003, after=2008; the numbers within the parentheses are standard errors. *** represent significant level at 1%

The table 3 shows the results of Different-in-Differences estimated by pooled OLS of the effect on log of non-farm income without control variables. The result indicates that the coefficient of interest is 0.657 with a positive sign and statistically significant. This empirical result illustrates that villages with road access may increase non-farm income by around 65.7% in comparison with the ones without the connecting road. The result is also in consistence with the hypothesis of investment in road infrastructure with significant impact on non-farm income.

Table 3.
Difference-in-Difference estimation of the effect on log of non-farm income

	<i>Treatment Group</i>	<i>Control Group</i>	<i>Difference</i>
Before	11.857 (0.135)	12.001 (0.097)	-0.144 (0.166)
After	13.003 (0.166)	12.489 (0.148)	0.513** (0.223)
Difference	0.489	0.657	0.657** (0.278)
observations	599	599	599

Note: before=2003, after=2008; the numbers within the parentheses are standard errors ** represent significant level at 5%

The table 4 shows the results of Different-in-Differences estimated by pooled OLS of the effect on log of total income without control variables. The result indicates that the coefficient of interest is 0.258 with a positive sign and statistically significant. It means that village with road access may increase total income by around 25.8% compared to the one lacking the connecting road. The result is also in consistence with the hypothesis of investment in road infrastructure with significant impact on total income.

Table 4.
Difference-in-Difference estimation of the effect on log of total income

	<i>Treatment Group</i>	<i>Control Group</i>	<i>Difference</i>
Before	14.485 (0.086)	14.416 (0.061)	0.069 (0.105)
After	15.446 (0.105)	15.118 (0.092)	0.328** (0.140)
Difference	0.960	0.702	0.258** (0.125)
observations	599	599	599

Note: before=2003, after=2008; the numbers within the parentheses are standard errors.** represent significant level at 5%

The table 4 shows the results of Different-in-Differences estimated by pooled OLS of the effect on log of total rice production without control

variables. The result indicates that the coefficient of interest is 0.291 with a positive sign and statistically significant. It means that village with road access may increase total rice product by around 29% compared to village without road access. The result is also in consistence with the hypothesis of investment in road infrastructure with significant impact on total rice production.

Table 5.
Difference-in-Difference estimation of the effect on log of total rice production

	<i>Treatment Group</i>	<i>Control Group</i>	<i>Difference</i>
Before	7.431 (0.062)	7.461 (0.044)	-0.030 (0.076)
After	7.931 (0.076)	7.670 (0.067)	0.261** (0.101)
Difference	0.500	0.209	0.291** (0.127)
observations	599	599	599

Note: before=2003, after=2008; the numbers within the parentheses are standard errors. ** represent significant level at 5%

The table 6 shows the results of Different-in-Differences estimated by pooled OLS of the effect on log of yield without control variables. The result indicates that the coefficient of interest is 0.038 with a positive sign but statistically insignificant. This implies that investment in road infrastructure has no significant impact on yield. The result is in consistence with the hypothesis.

Table 6.
Difference-in-Difference estimation of the effect on log of yield

	<i>Treatment Group</i>	<i>Control Group</i>	<i>Difference</i>
Before	7.308 (0.045)	7.366 (0.032)	-0.057 (0.055)
After	7.642 (0.055)	7.661 (0.049)	-0.019 (0.074)
Difference	0.334	0.295	0.039 (0.092)
observations	599	599	599

Note: before=2003, after=2008; the numbers within the parentheses are standard errors

The table 7 shows the results of Different-in-Differences estimated by pooled OLS of the effect on log cultivated areas without control variables. The result indicates that the coefficient of interest is 0.252 with a positive sign and statistically significant. It means that village with road access may increase cultivated areas around 25.2% compared to village without road access. The result is also in consistence with the hypothesis of investment in road infrastructure with significant impact on cultivated areas

Table 7.
Difference-in-Difference estimation of the effect on log of cultivated areas

	<i>Treatment Group</i>	<i>Control Group</i>	<i>Difference</i>
Before	0.123 (0.55)	0.096 (0.040)	0.027 (0.068)
After	0.289 (0.068)	0.009 (0.060)	0.280*** (0.090)
Difference	0.166	-0.087	0.253** (0.113)
observations	599	599	599

Note: before=2003, after=2008; the numbers within the parentheses are standard errors.
 ** represent significant level at 5%

The table 8 shows the results of Different-in-Differences estimated by pooled OLS of the effect on the number of households using tractors without control variables. The result shows that the coefficient of interest is 0.032 with a positive sign but statistically insignificant. The result suggests that the number of households using tractors does not increase in spite of their village having the road access, and the result is in line with the hypothesis.

Table 8.
Difference-in-Difference estimation of the effect on the number of households using tractors

	<i>Treatment Group</i>	<i>Control Group</i>	<i>Difference</i>
Before	0.075 (0.028)	0.096 (0.020)	-0.021 (0.035)
After	0.202 (0.035)	0.191 (0.031)	0.011 (0.046)
Difference	0.128	0.096	0.032 (0.058)
observations	599	599	599

Note: before=2003, after=2008; the numbers within the parentheses are standard errors.

The table 9 shows the results of Different-in-Differences estimated by pooled OLS of the effect on the number of households using fertilizer without control variables. The result indicates that the coefficient of interest is 0.222 with a positive sign and strongly statistically significant. It means that the number of households using fertilizer in village with road access may increase around 22.2% compared to the one without road access. The result is also in consistence with the hypothesis of investment in road infrastructure with significant impact on cultivated areas.

Table 9.
Difference-in-Difference estimation of the effect on households using fertilizer

	<i>Treatment Group</i>	<i>Control Group</i>	<i>Difference</i>
Before	0.119 (0.032)	0.107 (0.023)	0.012 (0.39)
After	0.461 (0.039)	0.226 (0.034)	0.235*** (0.052)
Difference	-0.341	-0.119	0.222*** (0.065)
observations	599	599	599

Note: before=2003, after=2008; the numbers within the parentheses are standard errors. *** represent significant level at 1%

The table 10 shows the results of Different-in-Differences estimated by pooled OLS of the effect on log of total income with some control variables. The result indicates that the coefficient of interest is 0.149 with a positive sign and statistically significant. The result is also in consistence with previous result. However, the size of effect is smaller. This result confirms that the villages with road access may increase their total income around 14.9% compared to the ones without road access. The result also supports the hypothesis.

Other control variables like age of the head of household, household size, the number of households using tractors and fertilizer also show positive effect with statistical significance. These result also in line with the previous results especially the number of households using tractors and fertilizer. Conversely, in spite of their positive sign the control variables such as the gender and the education of the head of household, the villages with electricity access and the villages with financial institution are statistically insignificant.

Table 10.
Difference-in-Difference estimated by pooled OLS of the effect on log of total income with some control variables

<i>Independent Variable</i>	<i>Single Pooled OLS</i>	<i>Multiple Pooled OLS</i>	<i>Panel Fixed Effect</i>
after	0.641	0.641	0.117
treatment	0.025	0.025	0.101
<i>treatafter</i>	0.898	0.149**	0.067
<i>hhage</i>		0.013***	0.004
hhsex		0.069	0.235
hheduc		0.081	0.054

Table 10 Contd ...

<i>hhsiz</i>	0.030**	0.014
<i>tractor</i>	0.457***	0.117
<i>fertilizer</i>	0.654***	0.11
electric	0.049	0.097
financial	0.292	0.187
<i>constant</i>	13.388***	0.302
No. of observations		599
R-squared		0.268
Adj R-squared		0.254
Prob > F		0.000

Note: before=2003, after=2008; the numbers within the parentheses are standard errors. *** represent significant level at 1% and ** represent significant level at 5%

The table 11 shows the results of Different-in-Differences estimated by pooled OLS of the effect on log of total rice product with some control variables. The result indicates that the coefficient of interest is 0.302 with a positive sign and statistically significant. The result is also consistent with previous result and almost the same size of effect. This result confirms that the villages with road access may increase their total rice product around 30% compared to the ones lacking road access.

The control variables, for example age of head of household, household size, the number of household using tractors and fertilizer, and the village with financial institution also show positive effect with statistical significance. Conversely, control variables such as the gender and the education of the head of household, the villages with electricity access present positive sign but having no statistical significance.

Table 11.
Difference-in-Difference estimated by pooled OLS of the effect on log of total rice production with some control variables

<i>Independent Variable</i>	<i>Coefficient</i>	<i>SE</i>
after	0.157	0.081
treatment	-0.089	0.070
<i>treatafter</i>	0.302 ***	0.115
<i>hhage</i>	0.012***	0.002
hhsex	0.07	0.162

Table 11 Contd....

hheduc	0.035	0.038
<i>hhsiz</i> e	0.072***	0.010
<i>tractor</i>	0.343***	0.081
<i>fertilizer</i>	0.381***	0.076
electric	0.047	0.067
<i>financial</i>	0.445***	0.129
constant	6.27	0.209
No. of observations	599	
R-squared	0.268	
Adjusted R-squared	0.255	
Prob > F	0.000	

Note: before=2003, after=2008; the numbers within the parentheses are standard errors. *** represent significant level at 1%

5. CONCLUSION

The results from analytical part show an important linkage between road connection and income of rural people. With the above analysis, we can observe that the investment in road has significantly contributed to the increase of household rice production, cultivated areas and total income, thus improving household living standard, and reducing poverty. However, in order to reap the full benefit of road access, the rural population will have to be aware of what they can gain from such infrastructure, seizing the opportunity to increase their agriculture production in hope to increase their income, thus alleviating the poverty. At the same time, other issues such as the provision of agriculture extension works including agriculture market information will have to be addressed and incorporated into the national strategy.

5.1 Policy Implication

It is important to realize that infrastructure development, particularly village connecting road can play a significant role in the country poverty alleviation. Thus, the rural road development should be an integral part of the national road sector development strategy and to be addressed accordingly and appropriately vis-a-vis the actual situation. The recommendation in connection with the issue of the development of rural road to curbe the poverty in Laos is, in spite of the constrain of budget allocated for other national social and economic development, to incorporate the connecting rural road plan into the national development strategy to allow the rural

communities with no connecting roads to have easy access to the main infrastructure and to be mainstreamed into the country economy to improve their daily activities and their livelihood.

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