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IMPACT OF SOCIAL SAFEGUARDING ON PRIVATE LAND OWNERSHIP AND INDIVIDUAL WELL-BEING: THE CASE OF SRI LANKA

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Abstract

Infrastructure development with properly planned safeguard measures is essential from the sustainable development perspective for the economic development in developing countries. The paper intends to identify the potential of social safeguard policies for the sustainable transport sector within the National Highway Sector Project (NHSP) in Sri Lanka. The objective of the paper is to provide pragmatic evidence on sustainable infrastructure development strategies in terms of social safeguards, measuring the outcomes and impacts of the road rehabilitation on affected people. From a household survey carried out along the road sections of the NHSP, including affected and non-affected groups, the empirical analysis entailed quasi-experimental evaluation of difference-in-difference (DID) estimation while measuring the impact of safeguard measures on the improvement of livelihoods and living standards. Qualitative information, using a mixed method of evaluation, supplemented the quantitative results. The results revealed that the income level for the treated and control groups is not significant, but further analysis highlighted that the estimated result for the income level in the DID approach is significant. This indicates that the safeguard policies over time for the members of the treated group are effective and efficient in the restoration of their income sources and increase people's income significantly. This leads to the implication that the safeguard policies increase the sustainability of the affected persons' livelihood and living standards. Qualitatively, the lessons learned through the impact evaluation study are that ADB's policy principles on consultation, disclosure, and grievance redress mechanisms include land for land and address wider social dimensions for sustainable infrastructure development. Further, the Country Safeguard System (CCS) achieves sustainability in social safeguards for involuntary resettlement equivalent to the involuntary resettlement CSS with ADB's SPS, acceptability of implementation readiness, reaching the affected poor and vulnerable, and livelihood programs. Finally, the major deliberation can concern green finance for infrastructure development projects integrating the pre-planned and strong social safeguard system in the implementing countries.

Keywords: infrastructure, impact evaluation, difference-in-difference, sustainability

JEL Classification: C54, C93, H43, Q01, Q15

Contents

1. INTRODUCTION

The implementation of safeguard policies and practices is part of the development of infrastructure and consists of the assessment of the quality of environmental and social safeguards for sustainable development. Therefore, safeguards are an integral part of the infrastructure development for green growth in many countries. Many donor organizations under infrastructure financing use social safeguards that aim to solve the resettlement issues and restore the income of the affected people in road rehabilitation projects.

In Sri Lanka, the Asian Development Bank (ADB) financed the National Highway Sector Project (NHSP) for transport sector development and safeguard implementation. However, the demand for the assessment of the safeguard policies in line with the Safeguard Policy Statement (SPS) is one of the key considerations for road rehabilitation and financing for sustainable development. Resettlement and income restoration programs for affected people act as social safeguards for achieving the objectives of livelihood and living standard improvement and poverty reduction. The impact evaluation assessed the degree of impact on the directly affected people and non-affected people before and after the project's implementation.

Long-term economic growth, reducing poverty and inequality, depends on development by improving lives to be socially inclusive and environmentally sustainable. Multilateral donor organizations are committed to maximizing the positive social and environmental results while minimizing the negative impacts and risks for the affected people in infrastructure development. Protection and investment in natural and social resources respond to the challenges of climate change, promote sustainable infrastructure solutions, and ensure social inclusion and accountability. ADB works to achieve these outcomes for social and environmental targets with a comprehensive set of safeguard policies for the projects that it finances. It believes that projects grounded in environmental and social sustainability are better projects.

A key pillar of development is infrastructure, which, when properly built and administered, leads to economic growth, higher productivity and competitiveness. Further, it is essential for improving the livelihood and living standards and the inclusiveness of societies. With higher growth of the population and economic regions, the demand for adequate, high-quality, and climate-friendly infrastructure increases. There are many challenges involved in providing infrastructure and services, such as rapid urbanization; limited access to basic water, electricity, and sanitation services; regional and global integration; natural disasters; and the need to address climate change adaptation and mitigation.

1.1 Importance of Safeguarding for Sustainability

In Asia, rapid urbanization, greater needs for natural resources, and natural calamities have increased the risks of population displacement, including displacement for development projects. ADB's involuntary resettlement safeguard application in selected projects relies on the Safeguard Policy Statement's involuntary resettlement policy principles in its assessment: early screening, meaningful consultations, improved or at least restored livelihoods of displaced persons, assistance for both physically and economically displaced persons, improvement of the living standards of displaced poor and vulnerable groups, assistance for persons without titles or rights to land, resettlement plans, disclosure, payment of compensation and other entitlements before possession, and monitoring and assessment of outcomes. The clearly defined policy

principles aim to achieve more than giving compensation and “doing no harm”; they favor drawing people that ADB-financed projects affect into the developmental process with the potential to improve their lives.

Occasionally, the involuntary resettlement of infrastructure development projects can cause severe economic, social, and environmental risks. Consequently, it may not be possible to manage the hardship and deprivation of the affected people optimally. Hence, ADB’s safeguards aim to avoid possible involuntary resettlement and to minimize it through several means.

This evaluation assesses how ADB’s involuntary resettlement safeguards add value in helping to achieve the broader development goals of poverty and inequality reduction while also paying attention to what is necessary to implement the SPS fully. The research method in the country for the infrastructure development project encompassed a document review, key person semi-structured interviews, including interviews with affected people, plus stratified random sample surveys among 200 affected households (AHs) and control groups in Sri Lanka.

1.2 SPS’s Alignment with Land Acquisition and Rehabilitation Regulation and Practices

The administration of the rehabilitation packages followed ADB’s financing requirements. The Government of Sri Lanka also administered the country safeguard system (CSS) in line with the SPS. These principles and processes stem from Sri Lankan laws, regulations, and guidelines and from the Safeguard Policy Statement of the Asian Development Bank (ADB 2009). The resettlement framework (RF) highlights and outlines the specific requirements that the executing agency of the investment program has to meet in the formulation and implementation of a resettlement plan/resettlement implementation plan (RP/RIP) for a project with potential resettlement impacts by focusing on their screening and categorization, socio-economic assessment, public consultations, resettlement planning, institutional arrangements for RP/RIP implementation, monitoring of results, grievance redress mechanism, and budget.

The Safeguard Policy Statement (SPS) explains the collective objectives of ADB’s safeguards, designs policy principles, and outlines the delivery process for ADB’s safeguard policy. The SPS developed from three safeguard policies on the environment, involuntary resettlement, and indigenous peoples. Then, it gathered into one single policy for consistency and coherence, and it comprehensively addresses environmental and social impacts and risks. The SPS directs sustainability by protecting the environment and people from the potential adverse impacts of projects.

The structure of the rest of this paper is as follows. Section 2 discusses the importance of impact evaluation as sustainable development for the literature. Section 3 presents the data and empirical approach of the impact evaluation. Section 4 contains the results of the assessment of social safeguards and a discussion. Section 5 presents the conclusion, while Section 6 gives policy recommendations for sustainable infrastructure development in the future.

2. LITERATURE REVIEW

Infrastructure development improves the livelihoods of people directly and indirectly through poverty alleviation. Multilateral development organizations have allocated various forms of financing to infrastructure development in the past in many developing countries. Along with road sector financing, a number of researchers have shown that infrastructure development is obligatory for improving people's livelihood (Van de Walle 1996; Jacoby 2000; Gibson and Rozelle 2003; Jalan and Ravallion 2003; Lokshin and Yemtsov 2005). Further, much infrastructure development consists of safeguard practices and assessment in the projects themselves for sustainable development in line with the road rehabilitation and financing. Among many impact evaluation studies on road rehabilitation, Gonzalez-Navarro and Quintana-Domeque (2016) conducted a seminal study. They applied a randomized experiment to quantify the impact of infrastructure development on poverty. Therefore, the rigorous evaluation of the impacts of infrastructure started with quasi-experimental methods.

Social safeguard practices and policies are one of the key considerations in road rehabilitation projects to evaluate the impacts of social development in line with the best practices of safeguard measures for the transport sector (ADB 2009). Second, a broader framework is necessary for evaluating the impacts of infrastructure on poverty reduction, since infrastructure cannot prevail in isolation. Meanwhile, most of the theoretical works have focused on the nexus between infrastructure and poverty outcomes, including income, health, education, and other individual socio-economic outcomes. However, these studies have been limited in their explanation of the dynamic or stochastic nature of poverty (Fafchamps 2003; Dercon 2005). A policy analysis of static poverty can result in inefficient policy interventions (Jalan and Ravallion 1998).

Providing access to infrastructure directly increases the income of households, improving their production. Indirectly, it changes consumption, saving, and investment decisions (Dillion 2011; Aoyagi, Sawada, and Shoji 2014). It is possible to use either experimental or non-experimental methods for the infrastructure evaluation. However, people regard the role of infrastructure as a facilitator of mutual complementarities between market, state, and communities, which play a critical role in correcting both market and government failures (Hayami 2009; Mansuri and Rao 2013).

2.1 Impact Evaluation of Infrastructure

By offering empirical evidence, impact evaluations aim to provide a better measure of the results attributable to development projects. Evidence-based decision making improves accountability and learning from development interventions. Further, before and after comparisons between outcomes, with and without projects, often lead to false conclusions. Thus, impact evaluation offers a set of tools to measure the project drivers for change that are truly attributable to the projects.

Understanding the most effective intervention is essential to ascertain causal relationships that will effectively reduce poverty. However, impact evaluations work on the counterfactual, which is a randomly selected "control group."

Even though impact evaluation is an innovative field, the literature has presented limited evidence about the contribution of individual infrastructure projects and programs to the achievement of the development goals. Further, to undertake empirical tests, the project designs included many choices and assumptions. Systematic measurement of project outcomes supports evidence-based decision making and helps in the effective design and implementation of the projects. On the other hand, non-experimental studies tend to

provide biased estimations due to selection bias, as countries place infrastructure in the areas where they expect high economic growth. In terms of measuring the infrastructure outcomes without bias, it is possible to use the experimental or quasi-experimental approach to establish causal impacts (Gonzalez-Navarro and Quintana-Domeque 2012).

It is difficult to prove the random placement of infrastructure, but, when infrastructure placement is beyond human alterations, it gives researchers a natural experimental setting similar to DiNardo's (2008). The seminal study by Duflo and Pande (2007) about the impact of dams in India on poverty reduction uses the quasi-experimental variable approach. Using transport networking data, Banerjee, Duflo, and Qian (2012) addressed the problem of endogenous placement to show the impact on the regional economic outcome. With the support of the role of infrastructure in reducing both chronic and transient poverty, a unique panel data study investigated irrigated and non-irrigated areas of Sri Lanka (Sawada et al. 2014). In another study, a household fixed-effects approach using panel data estimated the return on infrastructure investment in a rural development program in Bangladesh (Khandker, Barnes, and Samad 2009).

In a similar way, Dinkelman (2011) studied the impact of household electricity access on employment in South Africa, considering electrification as an instrumental variable. According to the above results, even though the income levels for the treated and control groups were not significant at the 5% level (see Table 3), further analysis (see Table 4) showed that the estimated results for the difference-in-difference approach were significant at the 5% level. This indicates that the safeguard policies for the treated group are effective and efficient over time in the restoration of their income sources and increase their income significantly. This leads to the inference that safeguards increase the sustainability of the livelihood and living standards among the affected persons.

3. DATA

The evaluation study conducted a socioeconomic survey of 201 households in two sections, (i) B153: Hikkaduwa-Baddegama and (ii) B157: Aluthgama-Lewwanduwa, of the National Highway Sector Project—Additional Financing. The survey intended to investigate income restoration and to assess whether the affected households were better or worse off after the project. The study adopted a mixed approach, with both qualitative and quantitative methods, for the analysis to produce detailed results with insights. It used impact evaluation techniques with both quantitative and qualitative data from the household survey. It drew the counterfactuals from comparable non-participant areas. For additional information, non-quantifiable variables, and robustness, the study collected qualitative information too.

4. RESULTS AND DISCUSSION

4.1 Quantitative Impacts on Affected Persons

This section presents the results of the DID estimation. Table 1 (Appendix) provides a summary of the sample statistics. To compare similar groups, the study conducted a balancing test. It checked the control and treatment groups prior to the road rehabilitation in Table 2 (Appendix) to define the observed outcomes between the treatment and the counterfactual groups. The evidence showed that the two groups are similar in most of the indicators that the analysis considered. Table 2 shows that there are no statistically significant differences across the treatment and control groups in these pre-rehabilitation variables. To compare the two groups, it is essential to test

the balance of the characteristics of the groups to ensure reliable estimates and robustness. This shows the mean comparison of the treated and control groups of persons in the road rehabilitation project before the implementation of the safeguard policies (Table 3). The results indicate that the two groups are equal in terms of the basic characteristics in the study, which eventually leads to the DID estimation.

Table 4 presents the covariate estimation of the DID method for the treated and control groups. The results revealed that the primary income, education of the household head (HH), ownership, land value, occupation, urban location, family size, proportion unemployed, proportion in business, proportion in industry, proportion in services, and household completeness are significant predictors of the difference in the treated and control groups of the study. While the results inferred that the project did not harm the affected households, they could also mean that the additional support through limited livelihood training had little impact on raising the income of the affected households living below the poverty threshold.

In the estimates of first difference, the improvement of the lower income group was minimal. The difference-in-difference estimates showed a significant improvement as a result of the income restoration program. Thus, the study suggests that policies can improve the intervention of the income restoration program along with the package for the betterment of the lower-income groups.

The quantitative assessment of the impacts of road rehabilitation on affected people used the double-difference method. Table 4 reports the results. The evaluation's stratified sample survey for the National Highway Sector Project—Additional Financing reflected virtually no change in post-project income levels, indicating at least restoration of livelihoods, in line with the SPS's bottom-line objectives, but no improvement for the poor and vulnerable in the first stage. These results support the assertion that those with privately owned lands took advantage of the increase in land prices tremendously after the road rehabilitation. The lands in urban locations have gained higher values for the livelihood improvement under the project. The proportion in business, industry, and services has significant impacts on the well-being of the affected groups in line with the counterfactual. Household completeness also showed a significant result for the road rehabilitation, indicating more rapid completion of the affected houses than the control.

According to the results, even though the income levels for the treated and control groups were not significant at the 5% level (Table 3), further analysis (Table 4) showed that the estimated results for the difference-in-difference approach were significant at the 5% level over a period of time. This indicates that the safeguard policies over time were effective and efficient for the members of the treated group in the restoration of their income sources and increase their income significantly.

The NHSP-AF survey also found that most respondents in the two road sections did not know about the grievance redress mechanism. The evaluation's stratified sample survey for the National Highway Sector Project—Additional Financing reflected virtually no change in post-project income levels, indicating at least restoration of livelihoods, in line with the SPS's bottom-line objectives, but no improvement for the poor and vulnerable. While not a mandatory requirement of the SPS, improving the livelihoods of the non-poor and vulnerable affected people would have offered both benefits for affected people and likely increased project returns.

4.2 Qualitative Impacts on Affected Persons

ADB policy principles on consultation, disclosure, and grievance redress mechanisms: The policy principles on meaningful consultation, disclosure, and the grievance redress mechanism (GRM) were not the priority for the projects. The study found a lack of explanation of the entitlements and resettlement options for the affected people. A majority of the people was not aware of their lump-sum compensation payments and GRM. It was evident that almost 50% of the people that the National Highway Sector Project—Additional Financing affected were satisfied with the Land Acquisition and Resettlement Committee (LARC) and Super Land Acquisition and Resettlement Committee (Super LARC system of hearings and reported that they had negotiated a better compensation package. The rest of the affected people complained that they were not satisfied with the LARC system due to the limited time, undue pressure, and lack of attention and transparency. The social impact assessment needs a reduction of communication issues. Almost half of the people that the NHSP affected were satisfied with the LARC and Super LARC, indicating that they had negotiated a better compensation package. The rest cited that limited time, undue pressure, and lack of attention and transparency were the reasons for their dissatisfaction with the LARC system (ADB 2016).

Land for land: Safeguard measures advocate for vulnerable communities regarding the need to rehabilitate sociocultural features, food security, and productivity, and the SPS advises replacing the lost land with other land “where possible” as compensation for land-based affected people. Sometimes, due to inelastic resources, land for land becomes an unlikely involuntary resettlement option.

Addressing wider social dimensions: ADB’s social dimensions map, including growth and social development, depends on policies and institutions that can recognize and promote equity, empowerment, security, and risk management. Social impact assessment (SIA) provides an integral part of involuntary resettlement planning and management strategies. Further, the NHSP produced a series of in-depth external monitoring and evaluation reports that explored a range of sociological perspectives on resettlement implementation. The project cases have developed good records of paying compensation to affected people, including poverty grants. For two projects, the external monitoring and evaluation specialists provided valuable additional information to improve the delivery, including problems delivering on entitlements, mainly in terms of their adequacy and timing.

Reaching the affected poor and vulnerable: It is a challenge to improve the living standards of the poor and vulnerable according to the policy principle. The RDA projects provided a one-off grant of $117 to those meeting the definition of affected poor and vulnerable, which includes the elderly, the disabled, and households with female heads. While this represents a serious attempt to reach those most in need among the affected, the results have yet to show that the grants bring the recipients up to the national minimum living standards.

Livelihood programs: It is necessary for each resettlement plan to present detailed measures for income restoration and livelihood improvement, encouraging the borrowers to make every effort to improve the incomes of displaced persons so that they can benefit from the project, based on the guidance. It indicates compensation at replacement rates plus additional necessary livelihood rehabilitation measures, with benefit sharing where possible. The NHSP provided livelihood programs that consisted of short skills-based training courses, with links to micro-credit sources. Despite interviews with several past trainees who had launched successful businesses as a result of the training, there was

less take-up of training than expected overall. The training courses experienced a reduction in scope and discontinuation during implementation. This may reflect (i) the project's minor adverse impacts on incomes and livelihood risks, with restricted access to roadside commercial and residential properties, generally limited to the short rehabilitation phase; and (ii) a lack of time or resources for effective needs assessment for training formulation.

5. CONCLUSION

The study explored the impacts of road rehabilitation in ADB-financed projects in Sri Lanka. The mixed method of evaluation enabled the study to gather quantitative and qualitative impacts for the affected persons. This paper examines the impacts of social safeguarding among the people that the road rehabilitation affected. The results of the quantitative analysis primarily revealed that the primary income, education of the household head, ownership, land value, occupation, urban location, family size, proportion unemployed, proportion in business, proportion in industry, proportion in services, and household completeness are significant predictors of the difference in the treated and control groups of the study. The evaluation's stratified sample survey for the National Highway Sector Project—Additional Financing reflected a significant difference in post-project income levels, indicating at least restoration of livelihoods, in line with the SPS's bottom-line objectives, but no improvement for the poor and vulnerable in the first stage. While not a mandatory requirement of the SPS, improving the livelihoods for the non-poor and vulnerable affected people would have offered both benefits for affected people and likely increased project returns.

The paper examines the importance of qualitative aspects of the Safeguard Policy Statement in Sri Lanka. The case of Sri Lanka provides the value of the SPS framework as a benchmark for safeguards as well as the areas that need continued strengthening in matters of design and especially implementation. The purpose of the evaluation is to elaborate on the net benefits of the safeguards in support of essential infrastructure investment. Sustained poverty and inequality reduction depend on growth that is environmentally sustainable and inclusive. To manage the certain social risks connected with the projects that it supports, in 2009, ADB adopted the Safeguard Policy Statement (SPS), which consolidates and updates previous safeguard policies on involuntary resettlement. This evaluation study supports safeguards in involuntary resettlement and recognizes the effective application of the safeguard policy for ADB and the Government of Sri Lanka.

6. POLICY RECOMMENDATIONS

According to the results, the income levels for the treated and control groups are significant. This indicates that the safeguard policies over time for the treated group were effective and efficient in the restoration of their income sources and increased their income significantly. This evidence leads to the inference that the safeguards increased the sustainability of the livelihood and well-being among the affected persons. Besides, it infers that the project did not harm the affected households; it could also mean that additional support through limited livelihood training had an impact on raising the income of affected households living below the poverty threshold. The NHSP-AF survey also found that most respondents in the two road sections did not know about the grievance redress mechanism. The Sri Lankan laws compare the CSS with ADB's SPS. The various relevant acts cover the permanent physical and economic impacts arising from

land acquisition. The SPS also covers those impacts, whether permanent or temporary, arising from involuntary restrictions on land use or on access to legally designated parks. Nevertheless, the gaps between the two approaches are still significant in this evaluation's view and require special attention when preparing resettlement plans. Among ADB's member countries, Sri Lanka's policy on involuntary resettlement has often received recognition as a national policy that is almost comparable to the SPS.

Thus, the recommendations for the policy makers are as follows:

- Designing land management as a package of income restoration and grievance redress to strengthen the CSS is essential.
- Safeguard implementation: the process of safeguard implementation in the national highway sector can follow the SPS guidelines to satisfy the requirement.
- Infrastructure development: this needs consideration as an inclusive package for the affected parties and the landowners.
- Road rehabilitation projects can implement social safeguarding in sustainable land management.
- An income restoration program for the affected parties is essential for recovering their income.
- Ownership of the land and well-being: the landowners are better off with the implementation of safeguarding approaches.
- The use of sustainable land management through a proper resettlement plan, which includes the social safeguarding component, is essential.
- The policy principles on meaningful consultation, disclosure, and grievance redress mechanism (GRM) were not the priority for the projects. Thus, it is essential to increase the entitlements and resettlement options of the affected people.
- ADB's social dimensions map, including growth and social development, depends on policies and institutions that can recognize and promote equity, empowerment, security, and risk management.
- It is necessary to reach the affected poor and vulnerable people to improve their living standard according to the policy principles.
- The resettlement plan presented detailed measures for income restoration and livelihood improvement, encouraging the borrowers to make every effort to improve the incomes of displaced persons so that they can benefit from the project based on the guidance.

REFERENCES

Asian Development Bank (ADB). 2009. *Safeguard Policy Statement*, 17 (Policy Principle No. 12). Manila.

———. 2016. *Real-Time Evaluation of ADB's Safeguard Implementation Experience Based on Selected Case Studies*. Independent Evaluation Department of ADB.

Aoyagi, K., Y. Sawada, and M. Shoji. 2014. *Does Infrastructure Facilitate Social Capital Accumulation? Evidence from Natural and Artefactual Field Experiments in a Developing Country*. JICA–RI Working Papers, No. 65. Tokyo: JICA Research Institute.

Banerjee, A., E. Duflo, and N. Qian. 2012. *On the Road: Access to Transportation Infrastructure and Economic Growth in China*. NBER Working Papers 17897. Cambridge, MA: National Bureau of Economic Research.

Dercon, S., ed. 2005. *Insurance against Poverty*. Oxford, UK: Oxford University Press.

Dillion, A. 2011. "The Effect of Irrigation on Poverty Reduction, Asset Accumulation, and Informal Insurance: Evidence from Northern Mali." *World Development* 39 (12): 2165–75. DiNardo J. (2008) *Natural Experiments and Quasi-Natural Experiments*. In: Palgrave Macmillan (eds). The New Palgrave Dictionary of Economics. Palgrave Macmillan, London.

Dinkelman, T. 2011. "The Effects of Rural Electrification on Employment: New Evidence from South Africa." *American Economic Review* 101 (7): 3078–108.

Duflo, E., and R. Pande. 2007. "Dams." *Quarterly Journal of Economics* 122 (2): 601–46.

Fafchamps, M. 2003. *Rural Poverty, Risk, and Development*. Cheltenham and Northampton, UK: Edward Elgar.

Gibson, J., and S. Rozelle. 2003. "Poverty and Access to Roads in Papua New Guinea." *Economic Development and Cultural Change* 52 (1): 159–85.

Gonzalez-Navarro, M., and C. Quintana-Domeque. 2016. "Paving Streets for the Poor: Experimental Analysis of Infrastructure Effects." *Review of Economics and Statistics* 98 (2): 254–67.

Hayami, Y. 2009. "Social Capital, Human Capital and the Community Mechanism: Toward a Conceptual Framework for Economists." *Journal of Development Studies* 45 (1): 96–123.

Jacoby, H. 2000. "Access to Markets and the Benefits of Rural Roads." *Economic Journal* 110 (465): 713–37.

Jalan, J., and M. Ravallion. 1998. "Transient Poverty in Postreform Rural China." *Journal of Comparative Economics* 26: 338–57.

———. 2003. "Does Piped Water Reduce Diarrhea for Children in Rural India?" *Journal of Econometrics* 112 (1): 153–73.

Khandker, S. R., D. F. Barnes, and H. A. Samad. 2009. *Welfare Impacts of Rural Electrification: A Case Study from Bangladesh*. Policy Research Working Paper. Washington, DC: World Bank.

Lokshin, M., and R. Yemtsov. 2005. "Has Rural Infrastructure Rehabilitation in Georgia Helped the Poor?" *World Bank Economic Review* 19 (2): 311–33.

Mansuri, G., and V. Rao. 2013. *Localizing Development: Does Participation Work?* Washington, DC: The World Bank.

Sawada Y., M. Shoji, S. Sugawara, and N. Shinkai. 2014. “The Role of Infrastructure in Mitigating Poverty Dynamics: The Case of an Irrigation Project in Sri Lanka.” *B.E. Journal of Economic Analysis & Policy* (Topics) 14 (3): 1–28.

Van de Walle, D. 1996. *Infrastructure and Poverty in Viet Nam*. LSMS Working Paper No. 121. Washington, DC: The World Bank.

APPENDIX

Empirical Approach

Difference-in-Difference Estimation

The basic idea of the method of project evaluation is to measure the outcomes of the control group over time in relation to the treatment group in the absence of the program. At least pre- and post-intervention cross-sections including both treated and control groups (additional pre-intervention data help to make identifying assumptions plausible) are possible with existing survey data. In addition, the data are available for a period before the intervention (baseline) as well as after the intervention (follow-up), and this allows for the use of difference-in-difference (DID) estimation.

An extension of the pre–post design is the inclusion of a group of non-participants to act as a baseline to control for time-invariant unobservable factors. This design may include things such as life cycle changes, economic shocks, and so on. The estimator is essentially the observed difference in outcomes of the participants pre- and post-program participation, minus the outcomes of non-participants over the same period (hence the term difference in difference). Formally:

$$TT = E(\Delta|X, D = 1) = [E(Y_{1t}|X, D = 1) - [E(Y_{0t}|X, D = 1)] - [E(Y_{1t}|X, D = 0) - E(Y_{0t}|X, D = 0)] \quad (1)$$

$$Y_{it} - Y_{0t} = \alpha^* + \varphi(X_{it}) - \varphi(X_{0t}) + X_{1t} - X_{0t} \quad (2)$$

Like the before and after estimator, the fixed-effects estimator works on the assumption that $E(Y_{1t} - Y_{0t} \mid D = 1) = E(Y_{0t} - Y_{0t} \mid D = 0)$; in other words, the *unobserved change* in outcomes of participants *in the absence of the program* would be the same as the observed change among non-participants over the same period. Therefore, while the fixed-effects estimator overcomes one of the limitations of the before and after estimator in allowing time-specific variants common to all groups, it is still vulnerable to those time-specific variants that differ between groups.

The Difference-in-Differences (DID) Estimator

The difference-in-differences (DID) estimator measures the impact of the program intervention through the difference between participants and non-participants in the before–after change in outcomes. To see how this estimation method works, assume that Y1 and Y0 are related to the observable variables X for individual i at time t as follows:

$$Y_{1it} = X_{it}\,\beta_1' + X_{1it} \quad (3)$$

$$Y_{0it} = X_{it}\,\beta_0' + X_{0it} \quad (4)$$

We assume that these equations are causal relationships and that $E[U_{1it}|X_{it}] = 0\ and\ E[U_{0it}|X_{it}] = 0$. The Xit vector usually includes a constant term, and in addition it may include one or more time-specific dummy variables, which indicate changes over time in the outcomes Y1 and Y0 that have to connection with the program being evaluated.

To begin, consider first the problem of estimating the average impact of the program on the treated, ATT, and the average impact for a treated individual i at time t for whom X = Xit, denoted by ATT(X = Xit). We define the latter parameter of interest as follows:

$$ATT(X = X_{it}) = E[Y_{1t} - Y_{0t} | P_t = 1, X = X_{it} \quad (5)$$

where conditioning on Pt = 1 restricts the sample to the treated. Note that we define ATT(X = Xit) for a particular point in time, t. It is possible that, if the program ran at a different time, or if the impact measurement took place at a later time (e.g. several years after the implementation of the program), the impact would be different.

Results and Discussion

The evaluation team carried out semi-structured interviews on several NHSP road sections, and a survey of 200 households on two NHSP-AF road sections (B153 and B157) showed the impacts on their pre- and post-project income.

Table 1: Summary Statistics

Variable	Mean	Standard Deviation	Min.	Max.	Observations
Primary Household Income (After)	44,722.51	49,807.75	2,000	400,000	191
Primary Household Income (Before)	34,182.54	52,720.56	2,000	500,000	189
Ethnicity of HH	1.08	0.47	1	4	201
Ownership	1.10	0.30	1	2	201
Staying Period	42.29	23.54	0.5	100	200
Age of HH	58.33	14.21	25	90	201
Sex of HH	0.77	0.42	0	1	201
Marital Status of HH	1.21	0.62	1	5	201
Disability of HH	1.11	0.42	1	3	201
Education of HH	14.03	4.07	1	8	199
IP Training	1.97	0.15	1	2	200
No Training	3.39	1.53	1	5	154
Microfinance	1.99	0.08	1	2	155
Samurdhi Recipient	1.90	0.29	1	2	199
Land Area (Before)	40.50	43.18	2	320	178
Land Area (After)	36.36	41.48	0	310	169
Land Value (Before)	126,779.80	99,868.56	1,500	1,000,000	193
Land Value (After)	268,974.10	162,522.90	5,000	1,500,000	193

Balancing Test

Table 2: Balance Test Results before Safeguard Implementation

	Treated		Control	
Variables	**Mean**	**SD**	**Mean**	**SD**
Income Level	34,722.51	29,845.63	33,182.54	30,913.42
Education of HH	13.5	6.53	14.2	5.42
Ownership	1.10	0.82	1.11	0.71
Years of Stay	45.4	6.9	46.2	12.3
Land Value	125,491.42	55,421.64	124,513.02	62,162.52
Occupation	10	–	11	–
Ethnicity	1.12	0.34	1.23	0.61
Sex of HH	0.89	0.45	0.73	0.46
Urban Location	0.82	0.55	0.81	0.45
Age of HH	47.4	14.3	52.6	12.5
Marital	1.32	0.62	1.33	0.71
Disability	0.71	0.44	0.72	0.46
Family Size	3.4	2.1	4.1	1.9
Proportion Unemployed	0.53	0.44	0.51	0.43
Proportion in Business	0.62	0.45	0.64	0.50
Proportion in Agriculture	0.38	0.33	0.41	0.33
Proportion in Industry	0.55	0.42	0.53	0.43
Proportion in Services	0.67	0.61	0.66	0.62
Household Completeness: Proportion of Complete Households	0.72	0.38	0.71	0.32

Impact Evaluation

Table 3 shows the quantitative evaluation of impacts between treatment and counterfactual groups.

Table 3: Comparison of Treatment and Control Households

	Treated		Control	
Variables	**Mean**	**SD**	**Mean**	**SD**
Income Level	41,722.5	11,253.3	32,182.5	12,973.1
Education of HH	15.41	3.63	9.47	6.21
Ownership	1.42	0.89	0.74	0.69
Years of Stay	44.56	5.32	43.21	7.31
Land Value	574,211.6	51,265.4	369,714.3	495,412.6
Occupation	7.8	–	10.4	–
Ethnicity	1.22	0.41	1.32	0.40
Sex of HH	0.68	0.56	0.67	0.55
Urban Location	0.87	0.25	0.62	0.63
Age of HH	48.4	18.2	49.3	12.4
Marital	1.42	0.72	1.40	0.57
Disability	0.82	0.62	0.88	0.45
Family Size	4.2	2.0	3.0	2.1
Proportion Unemployed	0.43	0.35	0.72	0.54
Proportion in Business	0.87	0.47	0.34	0.65
Proportion in Agriculture	0.42	0.42	0.61	0.63
Proportion in Industry	0.77	0.61	0.42	0.32
Proportion in Services	0.69	0.61	0.45	0.61
Household Completeness: Proportion of Complete Households	0.89	0.47	0.45	0.51

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Table 3 *continued*

Variables	Difference	t-Value	p-Value
Income Level	9,539.97*	1.53	0.069
Education of HH	5.94***	6.71	0.000
Ownership	0.68**	–1.28	0.028
Years of Stay	1.35	3.90	0.429
Land Value	204,497.9***	23.61	0.007
Occupation	–2.6**	12.10	0.041
Ethnicity	–0.1	3.50	0.923
Sex of HH	0.01	1.20	0.673
Urban Location	0.25***	4.62	0.000
Age of HH	–0.9	2.18	0.784
Marital	0.02	2.11	0.367
Disability	–0.06	1.31	0.532
Family Size	1.2**	4.12	0.034
Proportion Unemployed	–0.29**	7.13	0.021
Proportion in Business	0.53***	11.50	0.000
Proportion in Agriculture	–0.19	4.23	0.457
Proportion in Industry	0.35**	6.51	0.044
Proportion in Services	0.24**	7.24	0.026
Household Completeness: Proportion of Complete Households	0.44***	14.31	0.002

HH = household head.

Source: Author's estimations based on household survey data from the Independent Evaluation Department of the Asian Development Bank (2016). * denotes statistical significance at the 10% level, ** denotes statistical significance at the 5% level, and *** denotes statistical significance at the 1% level.

Table 4: Difference-in-Difference Estimation Results

Outcome Variable	Income	S. Err.	t-value	p-value
Baseline				
Control	3.4e+04	–	–	–
Treated	4.1e+04	–	–	–
Diff. (T-C)	5,983.90	8,893.73	0.91	0.361
Follow-Up				
Control	4.0e+04	–	–	–
Treated	4.9e+04	–	–	–
Diff. (T-C)	14,885.31	8,732.72	0.66	0.509
Diff.-in-Diff.	8,902.4***	3,204.641	0.87	0.008

* Means and standard errors are estimated by linear regression.

** Inference: *** p < 0.01; ** p < 0.05; * p < 0.1.