ASIAN DEVELOPMENT BANK
Independent Evaluation Department

IMPACT EVALUATION STUDY

ON

ASIAN DEVELOPMENT BANK'S ASSISTANCE FOR LOW-INCOME HOUSING FINANCE IN SRI LANKA

In this electronic file, the report is followed by Management's response and the Board of Directors' Development Effectiveness Committee (DEC) Chair's summary of a discussion of the report by DEC.

ADB

Evaluation Study

Reference Number: IES: SRI 2011−20
Impact Evaluation Study
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Asian Development Bank's Assistance for Low-Income Housing Finance in Sri Lanka

Independent Evaluation Department

Asian Development Bank

CURRENCY EQUIVALENTS

Currency Unit – Sri Lanka Rupee (SLR)

		At Appraisal	At Completion	At Evaluation
		26 August 1998	31 December 2004	31 December 2010
SLR1	=	$0.01513	$0.00955	$0.00907
$1	=	SLRs66.10	SLRs104.68	SLRs110.20

ABBREVIATIONS

ADB	–	Asian Development Bank
CBSL	–	Central Bank of Sri Lanka
DMC	–	developing member country
FGD	–	focus group discussion
HQI	–	housing quality index
IED	–	Independent Evaluation Department
IES	–	impact evaluation study
KII	–	key informant interview
LIH	–	low-income housing
PCI	–	participating credit institution
PCR	–	project completion report
PPER	–	project performance evaluation report
RRP	–	report and recommendation of the President
TA	–	technical assistance

NOTES

In this report, "$" refers to US dollars.

Key Words
asian development bank, households, housing finance, sri lanka, housing conditions, income, expenditure, labor force participation, education, health, poverty, outcome

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The guidelines formally adopted by the Independent Evaluation Department on avoiding conflict of interest in its independent evaluations were observed in the preparation of this report. Aniceto Orbeta, Mallika Samaranayake, and Daniel Westbrook assisted as consultants. To the knowledge of the management of the department, there were no conflicts of interest of the persons preparing, reviewing, or approving this report.

APPENDIXES

EXECUTIVE SUMMARY

Background on Low-Income Housing Operations in ADB

The Asian Development Bank (ADB) started providing low-income housing (LIH) finance in 1977. Since then, 40 loans and grants with LIH components were provided, accounting for 1.07% of the total value of ADB's loans and grants. Through the 1980s and 1990s, the ADB's approach to LIH operations evolved from traditional forms of slum upgrading to integrated urban development projects that included housing finance components. The funding levels increased from under $100 million in the late 1970s to over $600 million in the 1990s. During the 2000s, ADB's urban development projects focused more on urban infrastructure and service provision, and investments on housing declined to about $350 million. In December 2010, ADB approved a private sector loan to Indonesia for $300 million, raising the total to nearly $650 million for 2000–2010. Given the potential for LIH finance to contribute to ADB's strategic agenda on inclusive growth, it is important that LIH projects are assessed critically based on factual evidence to guide future operations in the subsector.

Of the 40 projects involving LIH components, 30 have been completed and 22 have had project completion reports (PCRs). The Independent Evaluation Department (IED) has re-evaluated 14 PCRs with project performance evaluation reports (PPERs). Overall, 4.5% of projects were rated *highly successful*, 60% *successful*, 18% *partly successful*, 4.5% *unsuccessful,* and the rest unrated. Main lessons learned from these ex-post evaluations emphasized the importance of balancing the scope of activity and complexity of implementation in the project design, more specific targets for low-income groups, the relatively less efficient and more expensive provision of LIH by the public sector compared with the private sector, and the need for analytical frameworks and monitoring and evaluation systems. While the PCRs and PPERs assessed the project implementation and performance, including loan disbursements and uses, services provided to households, and improvements in the physical conditions of houses, none of these assessed the socioeconomic impacts on project beneficiaries.

Urban Development and Low-Income Housing (Sector) Project in Sri Lanka

The project was approved by ADB's Board in 1998 and was completed in 2005. It had a total cost of $102.99 million and supported four activities: housing finance (26.1%), urban infrastructure (62%), community development (2.9%), and institutional development (7.1%). The housing finance component had three objectives: (i) to increase access of low-income households to market-based housing finance through the formal sector; (ii) to facilitate improvements in housing conditions and quality of life; and (iii) to promote formal banking sector interest in serving the low-income sector of the housing market. The project documents set "improving living conditions and quality of life" as its goal but did not explain the linkage between housing loans and this intended outcome**.** At completion, the project had provided 28,378 housing loans to households that fell below the 55th percentile (the eligibility criteria) of the income distribution in Sri Lanka. The PCR rated the housing finance component *relevant*, *effective*, *efficient*, and *less likely sustainable*. The PCR found that the target households benefited from better access to housing loans that enabled them to improve their housing and living conditions.

Objective and Scope of the Study

This report presents an impact evaluation study (IES) of the housing finance component of the Urban Development and Low-Income Housing Project in Sri Lanka (Loan 1632). The IES empirically assessed the socioeconomic impacts of the project's housing loans and, on that basis, provides lessons and recommendations to help enhance the development effectiveness of ADB's future LIH finance projects.

The literature on LIH finance indicates that better housing conditions provide the family with a more peaceful atmosphere, increase household labor force participation, increase household income, lower absenteeism from school, and reduce the risk of diseases among family members, among other things. The IES estimated the household welfare impact of the housing loans, using six household-level outcome indicators: (i) housing quality, (ii) household income and expenditure, (iii) household completeness, (iv) labor force participation, (v) education of school-age children, and (vi) health indicators. For each outcome, the IES estimated the overall average impact, and—to assess the effect of project design parameters—disaggregated impacts by education level of the household head, by loan term, by loan use, and by period of loan disbursement.

The IES used the matching estimation method based on four characteristics of the household head (age, education, employment sector, and sex) and three characteristics of the household (community location, family size before 1998, and urban-rural location). The analysis was based on four sets of empirical information collected for this study: (i) a survey of 1,011 project or treatment households and 1,011 non-project or control households; (ii) a survey of 15 communities that had project borrowers and 15 communities that had no project borrowers; (iii) 50 key informant interviews (KIIs) with government officials, local authorities, and associations; and (iv) 30 focus group discussions (FGDs) with members of borrowing and non-borrowing households. The household survey data were used for statistical analyses, while community data and information from the KIIs and FGDs were used to support and reconfirm the results of the quantitative analyses.

The IES had two limitations. The first was the absence of credible baseline data. During the preparation for this IES, the evaluation team searched the ADB project database for a suitable LIH project that had been completed about 5 years ago. Loan 1632 was chosen because it appeared to have a clear rule on selecting project participants and the best baseline household information. However, during the data collection phase, it turned out that the available baseline household information was partial and inconsistent. The IES then had to rely on evaluation methods with no baseline data. The IES used the Hausman test to check for selection biases in the estimated impacts caused by unobservable differences between the project and non-project households; the outcomes of the test guided the selection of non-project households as potential matches for project households.

Second, due to time and funding constraints, household and community surveys were conducted in five out of the nine project provinces, focusing on the districts with most project borrowers. The IES made the best effort to select survey households to control for other community development components provided by the project. However, the estimated impacts may still include some contributions from those other project components.

Summary of Key Findings

Project beneficiaries. The evidence provided by loan records from the participating credit institutions (PCIs) and the household survey showed that only about 1% of the project beneficiaries were from the lowest 10% income group with monthly household incomes below SLRs2,500, while about 60% were from the 30th to 40th percentile of the income distribution (SLRs5,000–SLRs10,000) and about 25% were from the middle income group (SLRs10,001–SLRs12,500).

Housing loan provision. The data indicated that the project was implemented as designed, since nearly all the borrowers met the income eligibility requirement and nearly all the loans complied with the project requirements. The average loan in 2010 terms was about SLRs200,000 or about 4.5% of the present average value of borrowers' houses. About 82% of the loans were used for extension or renovation of existing houses; 13% were used toward construction of new houses; 3% were used to buy land; and a small number of loans were used for service connections or were put toward the purchase of new houses.

Household impacts. Simple comparisons of project and non-project households indicated that the housing loans had significant effects on nearly all the six outcome indicators used in the analysis. However, more rigorous estimation by matching project with non-project households showed otherwise. The impacts on the housing physical conditions and household expenditure and income were found to be generally more robust than the impacts on higher-order welfare measures related to education, health, and labor force participation. The IES found that about two-thirds of project households were satisfied with the physical housing conditions and generally indicated that quality of life had improved. The increase in household expenditure and income might be attributed partly to higher labor force participation of women among the project households. The IES attributed the marginal impact on higher-order welfare measures to the fact that a majority of project households were already near the middle income level and generally not the very poor. Thus, they had generally good health, their children were already enrolled in school, and the adults were well-educated and working. It therefore seems unlikely that relatively modest loans for home improvement would exert substantial influence on higher-order welfare outcomes such as education and health.

Household access to credit. It appeared that the project achieved its objective of facilitating access to formal sector housing finance. The IES found that the project and non-project households had similar numbers of loans from sources other than the project. However, the sampled project households had average non-project loan amounts about twice those of the non-project households. Likewise, the total credit obtained by sampled project households was about 50% higher than the total credit obtained by those non-project households that did borrow, implying the project households were able to leverage better. The average credit secured by project households from all sources during 1998–2011 was nearly SLRs250,000, i.e., about triple the average project loan. Finally, marginally fewer sampled project households than non-project households reported ever having a loan application rejected (1.24% versus 1.34%).

Community impacts. The community survey, KIIs, and FGDs revealed improvements in the community quality of life, especially in children's school attendance, general health conditions, and gender equity in both project and non-project areas. Less-pronounced improvements were found in employment opportunities, municipal service delivery, participation in community activities, and community peacefulness. Due to data limitations, the IES could not

discern statistically whether the project communities improved more than the non-project communities, and whether the improvements were due to the housing loans.

Key Lessons

Targeting. The project set the participation eligibility for incomes below the 55th income percentile, and the PCIs applied conventional loan procedures and standards of creditworthiness. As a result, most beneficiaries were near middle income households, whose labor force participation, schooling enrolment, and health conditions were already high. Only about 1% of the beneficiaries were from the lowest 10% income group. The weak impacts found on household welfare measures (education and health) might be due to the fact that most beneficiaries were not very poor. Targeting poorer households could make the project welfare impacts more robust.

Housing loan design. The housing loans were only about 4.5% of the housing value in present terms. This was too small for significant home improvements. Many project households therefore borrowed additionally from other sources to improve their houses and thus accumulated additional immediate repayment pressures. This may have made them less attentive to activities to improve their higher-order welfare measures such as education and health. The IES found that loans with longer terms had clearer effects on education of children and health conditions of family members. This supports an argument for providing housing loans with a higher ceiling and longer repayment periods.

Issue

Baseline data. Lack of baseline data has been a key impediment to the conduct of impact evaluations. In this IES, the project required loan applications to include essential household data. Contrary to the initial investigation, during the implementation of the IES, PCIs could not provide all approved application records and they certainly did not keep failed applications. Baseline data, even where collected, did not necessarily include such data for an appropriate control group. Data storage was also not ideal. Similar issues are evident in other ADB projects examined prior to the study. Since December 2010, ADB has begun to actively promote impact evaluation through the establishment of an impact evaluation committee comprising heads of departments and a staff working group led by the Economics and Research Department. However, the resources available in terms of funding and staff skills for impact evaluations are still limited.

Recommendations

The following recommendations are provided for consideration by management:

Recommendation	Responsibility	Timing
1. **Improve the analysis and design of LIH projects for better targeting and greater welfare impacts.** LIH loans were supposed to help poor households improve their living conditions and subsequently their welfare. However, the borrowers did not turn out to be the relatively poorer segment of the eligible group. Careful poverty analysis and proper selection criteria and more flexible loan procedures would enhance the inclusiveness and	Regional departments	From January 2012

Recommendation	Responsibility	Timing
beneficial impacts of the project. Likewise, flexibility in the loan size, loan term, and loan use enhance the type and magnitude of the impacts.		
2. Increase gradually the collection and maintenance of baseline data on selected projects amenable for impact evaluation. Having credible baseline data is critical for impact evaluations to demonstrate project development effectiveness. For this, proper baseline surveys of carefully specified project and non-project groups of sufficient size and geographic coverage are essential. Such surveys should use well-designed and tested questionnaires to elicit information required for evaluations. Survey questionnaires and sampling strategy need to take into account the context of project design to ensure that every element of the project is appropriately covered. Sufficient resources, both funding and staff skills, need to be provided.	Regional departments, Economics and Research Department, Impact Evaluation Committee	From January 2012

Hemamala Hettige
Officer-in-Charge
Independent Evaluation Department

I. INTRODUCTION

A. Background and Rationale

1. Housing is generally considered the most important family asset, and low-income housing (LIH) solutions are deemed decisive in reducing poverty and vulnerability of the poor.[1] Housing problems are among the most visible indicators of poverty. Estimates for 2010 show that there are 505 million slum dwellers in Asia and 827 million worldwide.[2] According to the United Nations Human Settlements Programme (UN-Habitat), a "do-nothing" approach will permit further increases in slum populations, with numbers reaching nearly 900 million worldwide by 2020.

2. LIH finance projects provide housing loans to low-income households to improve their housing conditions and thus their quality of life. The literature on LIH finance indicates that better housing conditions provide the family with a more peaceful atmosphere, increase household labor force participation, increase household income, lower absenteeism from school, and reduce the risk of disease in the family, among other things.[3]

3. Governments and donors are therefore exerting efforts to provide LIH finance for the poor. The Strategy 2020 of the Asian Development Bank (ADB) highlights ADB's strategic agenda in sustainable and inclusive growth.[4] According to the urban operation plan being finalized, ADB will pursue an urban development approach of promoting livable cities and addressing the urban infrastructure deficit.[5] To improve the quality of life of urban inhabitants, ADB will assist its developing member countries (DMCs) in solving a range of social and environmental problems resulting from rapid urbanization, and will support urban growth strategies for more livable, more inclusive, and more resilient development. Discussions at UN-Habitat's World Urban Forum 5 in Rio de Janeiro (22–26 March 2010) included arguments to revive the interest of the development community in urban development. Housing finance, which had received less attention in the late 1990s, is getting more attention from governments and international funding institutions, including the World Bank.

B. Objective and Scope of the Study

4. This impact evaluation study (IES) aimed to empirically assess the socioeconomic impacts of the housing finance component of ADB's Urban Development and Low-Income Housing Project in Sri Lanka.[6] The project had four components: housing finance, urban infrastructure, community development, and institutional development. The IES assessed the impact of the housing finance component but did not assess the impact of the three other components. The IES also aimed to provide operational recommendations to help enhance the development effectiveness of ADB's future LIH finance projects.

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1 ADB. 2008. *Managing Asian Cities*. Manila.

2 UN-Habitat. 2010. *State of the World's Cities 2010/2011 – Cities for All: Bridging the Urban Divide.* London: Earthscan Publications.

3 Tibaijuka, A. K. 2009. *Building Prosperity: Housing and Economic Development*. UN-Habitat. London: Earthscan Publications.

4 ADB. 2008. *Strategy 2020: The Long-Term Strategic Framework of the Asian Development Bank, 2008–2020*. Manila.

5 ADB. Draft Urban Operation Plan. Draft of 28 March 2011.

6 ADB. 1998. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Democratic Socialist Republic of Sri Lanka for the Urban Development and Low-Income Housing (Sector) Project*. Manila (Loan 1632-SRI).

5. First, the IES reviewed ADB's LIH finance operations based on their performance assessments in the project completion reports (PCRs) and project performance evaluation reports (PPERs), to give an overview of ADB's experience in the sector to date. Second, the IES reviewed the recent literature on housing finance to pinpoint development issues of LIH finance and to determine outcome indicators and the analytical framework for assessing project impacts to be used in this study. Third, the IES conducted a household survey of 1,011 project households and 1,011 non-project households, and a community survey of 15 communities that had project borrowers and 15 communities that did not have project borrowers. The IES also conducted 30 focus group discussions (FGDs) involving both project and non-project households, and 50 key informant interviews (KIIs) with government officials, local authorities, and various associations concerned. The IES then used the household survey data to estimate impacts of the housing loans on borrowers, using the nearest-neighbor covariate matching method. The IES used the Hausman test to guide selection of non-project households as potential matches of project households, in order to control for potential selection biases. The IES used the community survey data and information from the FGDs and KIIs to support and reconfirm the estimation results. Finally, the IES highlighted key findings, lessons learned, and pending issues, and provided recommendations for strengthening the design and development effectiveness of ADB's future LIH projects.

C. Limitations of the Study

6. The IES was subject to two limitations. The first was the absence of reliable baseline data. During the preparation for this IES, the evaluation team searched the ADB project database for a suitable LIH project completed about 5 years ago. Loan 1632-SRI was chosen because it appeared to have a clear rule on selecting project participants and the best baseline household information. However, during the data collection phase, it turned out that the participating credit institutions (PCIs) could provide loan data with household income for only about 55% of the project borrowers, and even for this group, the available information was incomplete and inconsistent.[7] No information was provided for the rejected applicants. Moreover, there were no historical records on households and their homes. Selection of non-project/control households was done in 2010 and relied on knowledge of the local government authorities to find households in the neighborhoods of the project/treatment households that they judged would have been similar to the project/treatment households before the project started in 1998. The IES estimated the project impact using the matching method. To control for selection biases in the estimated impacts caused by unobservable differences between the project and non-project households, the IES used the Hausman test for two different matching specifications. The outcomes of the test were used to guide the selection of non-project households as potential matches for project households. The impact estimates, however, were subject to the assumption that they were based on a credible comparison group.

7. Second, due to time and funding constraints, the samples of project and non-project households were drawn from five out of nine project provinces, and in each selected province concentrated on one district with the most borrowers.[8] Under this selection of the household survey samples, the IES was unable to control for the other project's community development components not included in this study. The estimated impacts therefore may include contributions from these other project components.

[7] Of a total of 28,378 loans, the lending banks provided 15,629 loan records with household income.

[8] The program provided funds for 28,378 loans in nine provinces. Of the nine provinces, the Northern and Eastern provinces had only 383 borrowers (1.3% of the total number). There also were few borrowers in the North Western (1,658 or 5.8%) and Uva (1,420 or 5%) provinces.

II. ADB'S LOW-INCOME HOUSING FINANCE OPERATIONS

A. Overview of ADB Low-Income Housing Finance Operations

8. ADB started providing LIH finance in 1977. Since then, its approach in the sector has evolved to include traditional slum-upgrading projects, integrated urban sector development projects, and stand-alone housing finance projects. The loan and grant amounts approved increased gradually from slightly below $100 million in the late 1970s to about $270 million in the 1980s, and reached a peak of over $600 million in the 1990s. During the 2000s, ADB's urban development projects focused more on urban infrastructure and service provision, and investments in housing declined to about $350 million through 2009.[9] In December 2010, ADB approved a private sector loan of $300 million to Indonesia, bringing the total to nearly $650 million for 2000–2010. Overall, 12 countries have borrowed or received LIH grants from ADB in 40 projects totaling over $1.6 billion (Table 1). A detailed list of ADB's LIH loans, grants, technical assistance (TA), and non-sovereign operations is in Appendix 1.

Table 1: Loan and Grant Approvals for Housing
(up to 15 May 2011)

	LIH Loan and Grant Approvals		All ADB Loans and Grants		
Period of Approval	**Number**	**Amount** ($ million)	**Percent of All ADB Loans and Grants**	**Number**	**Amount** ($ million)
1966–1969	…	…	…	21	99.68
1970–1979	4	98.8	2.45	239	4,040.57
1980–1989	7	269.6	2.41	262	11,206.53
1990–1999	9	612.0	1.92	323	31,915.58
2000–2010	20	646.3	0.61	2,195	105,369.54
Total	**40**	**1,626.7**	**1.07**	**3,040**	**152,631.90**

… = not available, ADB = Asian Development Bank, LIH = low-income housing.
Note: Data include stand-alone loans and grants for housing and urban development projects with housing components. For the latter, the full amount of loan was used.
Source: ADB Independent Evaluation Department calculations based on the ADB database.

9. Of the 30 completed loans, 22 had PCRs prepared by the implementing departments, and 14 of these have been re-evaluated either through PCR validation reports or project performance evaluation reports (PPERs) by the Independent Evaluation Department (IED). Table 2 below shows the ratings.[10] Overall, 4.5% of projects were rated *highly successful*, about 60% *successful*, 18% *partly successful*, and 4.5% *unsuccessful*. Three projects (13.6%) carried out during the early 1980s were not rated.

Table 2: Project Performance Ratings

Rating	Number	Percent
Highly Successful	1	4.5
Successful	13	59.1
Partly Successful	4	18.2
Unsuccessful	1	4.5
Not Rated	3	13.6
Total	**22**	**100.0**

Source: Asian Development Bank loan databases.

[9] Analyzing reasons for such change is beyond the scope of the IES.
[10] Post-evaluations are ordered by their importance—PPER being the highest, followed by PCR validation report, and PCR. The ratings in Table 2 are from the highest-order report available.

10. The PCRs, PPERs, and special studies have highlighted several important lessons and recommendations for the LIH subsector. Generally, ADB experience shows that public-sector-provided housing is more expensive and less efficiently provided than that built by individuals or through nongovernmental organizations.[11] However, none of the PCRs or PPERs assessed the project's socioeconomic impacts on the beneficiaries. At best, they reported simple outcomes such as house construction, access to services, and loan disbursements and uses. On sustainability, they mostly reported improvements in related institutions and/or policies and sources of revenue to run those institutions and/or policies. For the former, most projects received a *likely* rating, while for the latter they appeared mixed. IED's evaluation reports and studies on ADB's LIH finance provided a number of lessons learned. Key success and failure factors were: (i) the time frame for complex, integrated projects should be adequate to allow periodic reviews of master plans and effective changes, if needed; (ii) a modest scope with high quality is preferable to large integrated projects; (iii) project design should incorporate specific targets for low-income groups; and (iv) strong analytical frameworks and monitoring and evaluation systems helped ensure successful projects. Regarding efficiency, the reports pointed out that evaluation of housing projects based on a conventional project cost–benefit analysis might result in relatively low economic internal rates of return.[12]

B. Urban Development and Low-Income Housing Project in Sri Lanka

11. The project was approved by ADB's Board in 1998 and completed in 2005. It had four components: (i) urban infrastructure; (ii) community development; (iii) housing finance; and (iv) institutional development.[13] Of the project's total cost of $102.99 million, $26.93 million went to the housing finance component. Overall, the PCR rated the project *partly successful*, and *relevant*, *effective*, *less efficient*, *less likely* (for sustainability), and *generally on target* (for impact).[14] Table 3 shows the actual expenditure for each project component.

Table 3: Loan 1632-SRI: Actual Expenditure

	Amount ($ million)		Total	
Expenditure Component	**ADB**	**Government**	**Amount** ($ million)	**Percent**
A. Urban Infrastructure	40.28	23.60	63.88	62.00
B. Community Development	1.41	1.60	3.01	2.90
C. Housing Finance	19.93	7.00	26.93	26.10
D. Institutional Development	3.53	3.77	7.30	7.10
E. Imprest Account/Interest and Charges	1.87	0.00	1.87	1.80
Total	**67.02**	**35.97**	**102.99**	**100.00**

ADB = Asian Development Bank.
Source: ADB. 2006. *Completion Report: Urban Development and Low-Income Housing (Sector) Project in Sri Lanka.* Manila.

[11] ADB. 2000. *Project Performance Audit Report: Low-Income Housing Development Project in the Republic of the Fiji Islands* (Loan 1005-FIJ). Manila.
[12] ADB. 1995. *Sector Synthesis of Postevaluation Findings in the Urban Development and Housing Sector.* Manila.
[13] The urban infrastructure component included 73 urban infrastructure subprojects in roads and traffic improvement, stormwater drainage, town center developments, water supply, and public sanitation. The community development component involved improvements of basic community infrastructure and land tenure regularization in 8 low-income communities. The institutional development component provided formal and on-the-job training to enhance staff skills in municipal financial management, management information systems, municipal engineering and environmental management, and computerization.
[14] ADB. 2006. *Completion Report: Urban Development and Low-Income Housing (Sector) Project in Sri Lanka.* Manila.

12. The housing finance component had three objectives: (i) to increase access of low-income households to market-based housing finance through the formal sector; (ii) to facilitate improvements of housing conditions and quality of life; and (iii) to promote formal banking sector interest in the low-income housing finance market segment (report and recommendation of the President [RRP], para. 51).[15] The RRP set "improving living conditions and quality of life" as the project's goal but did not explain the link between housing loans and this intended outcome (RRP, Appendix 1). At completion, the project provided 28,378 housing loans in the total amount of $26.93 million, comprising $19.93 million from ADB and $7 million equivalent contribution from PCIs. The project required households with monthly incomes below SLRs8,500 to qualify for project housing loans.[16] Loans were lent at the prevailing market interest rates through seven PCIs, which were selected based on their meeting financial performance standards of the Central Bank of Sri Lanka (CBSL) and also their capacity and willingness to commit their own capital to the program.[17]

13. The PCR rated the housing finance component *relevant*. About 99% of the loans were used for construction of new houses, extension and renovation of existing houses, and purchase of land for new house construction. The component was made more relevant in 2000 by increasing the household eligibility threshold from a monthly income of SLRs8,500 to SLRs12,500 to reflect the prevailing price level. Simultaneously, the maximum loan amount was increased from SLRs100,000 to SLRs200,000 to accommodate the increase in the price of building materials and construction costs. Also in 2000, the loan maturity was raised from 10 to 15 years, and house purchase was added as an eligible loan use.

14. The housing finance component was rated *effective*. Almost three-quarters of the loans were made to households with monthly incomes below the second income quantile (i.e., below SLRs10,000) and 26% went to households with monthly incomes in the third income quantile (SLRs10,001–SLRs12,500). The component was rated *efficient*, as full disbursement was attained by early 2004 and loan disbursements exceeded the appraisal estimate of $25 million.[18] Appendix 2 outlines the loan disbursements. The component's sustainability was rated *less likely*. The change in the institutional arrangements during implementation resulted in noncompliance with the loan covenant on the establishment of a housing revolving fund for LIH. At the same time, the government introduced its new LIH scheme, and market interest rates dropped from 16% per annum in 1999 to approximately 10% per annum in 2003. Without a housing revolving fund, the sustainability of the housing finance component was less likely. Finally, the PCR's impact analysis found that low-income households (with monthly income below the 55th income percentile) benefited from better access to affordable housing loans, as it enabled them to improve their housing and living conditions. However, the PCR found no significant improvement in health indicators.

[15] ADB. 1998. RRP (footnote 6).

[16] The income distribution was based on Sri Lanka's Household Income and Expenditure Survey of 1990–1991. The households below the 55th percentile of the income distribution (SLRs8,500) were considered low income. In 2000, the cutoff was updated to SLRs12,500 to reflect price increases.

[17] The seven PCIs were: Housing Development Finance Corporation (68.6%), three regional development banks (Kandurata Development Bank, Rajarata Development Bank, Ruhunu Development Bank, 27.9%), and three commercial banks (Commercial Bank of Ceylon, Hatton National Bank, and National Development Bank–Housing Bank, 3.5%). Beginning in May 2010, Kandurata Development Bank, Rajarata Development Bank, and Ruhunu Development Bank were merged with three other regional development banks to become the Regional Development Bank.

[18] The total loan exceeded the $25 million estimate at the appraisal because the PCIs' contributions exceeded the minimum requirement of 20% of ADB funds (the actual contribution was about 26%).

III. REVIEW OF LITERATURE ON IMPACT OF HOUSING FINANCE

15. The literature on the welfare impact of LIH programs is very sparse. Field and Kremer (2008) reviewed impact evaluation methodologies for interventions designed to upgrade slums.[19] Their paper includes a number of case studies of complex housing programs that bundled interventions targeting physical infrastructure, social development, and households simultaneously. Di Tella and MacCulloch (2006) described the value of using subjective assessments of quality of life for evaluating policy outcomes.[20] Marcano and Ruprah (2008) evaluated Chile's Progressive Housing Program that was carried out in 1991–2003 and later became the model for several similar programs throughout Latin America.[21] Cattaneo et al. (2009) evaluated the effects on child health and adult happiness of a large-scale, highly targeted program to replace dirt floors with cement floors in Mexico.[22] The following is a brief review of the literature by outcome measures of interest to this study.

16. **Impact on housing quality**. Using a composite housing quality index, Marcano and Ruprah (2008) found significant positive effects on physical conditions of houses and on access to water, sewer, and electricity connections. However, they also found that overcrowding increased because the new houses contained only one common room, plus a kitchen and bathroom. A post-evaluation study of 12 urban sector development loans by ADB (1997) during 1976–1989 found that 70% of the survey respondents were happy with improved housing conditions.[23]

17. **Impact on household consumption and income**. The same ADB (1997) study also found that, strangely, income and consumption expenditure indicators appeared to be higher in the comparison group than in the treatment group.[24] Marcano and Ruprah (2008) detected positive but statistically insignificant effects on poverty alleviation.

18. **Impact on labor force participation**. Marcano and Ruprah (2008) did not find any discernible impact of Chile's Progressive Housing Program on the occupation ratio (the proportion of working adults to all household members). On the other hand, Field (2003) found very strong positive relationships between land-tenure rights and hours worked, a shift away from work at home, and reduction in child labor.[25] This result arises because people with secure land-tenure rights need not spend time and effort to maintain possession of land on which they previously were squatters.

19. **Impact on household completeness**. Household completeness is defined as the presence of both the household head and his/her spouse, if they are formally married. Other things equal, household completeness should contribute to household welfare, especially the

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[19] E. Field and M. Kremer. 2008. *Impact evaluation for slum upgrading interventions.* Washington, DC: World Bank.

[20] R. Di Tella and R. MacCulloch. 2006. Some uses of happiness data in economics. *Journal of Economic Perspectives.* 20 (1). pp. 235–246.

[21] L. Marcano and I. J. Ruprah. 2008. *An impact evaluation of Chile's progressive housing program*. Inter-American Development Bank Office of Evaluation and Oversight, Working Paper No. OVE/WP-06/08. Washington, DC.

[22] M. D. Cattaneo et al. 2009. Housing, Health and Happiness. *American Economic Journal: Economic Policy*.

[23] ADB. 1997. *Impact Evaluation Study: Bank Assistance to the Urban Development and Housing Sector.* Manila. The 12 projects included 2 urban housing projects in Thailand (Loan 0481-THA: Bang Plee New Town and Loan 0736-THA: Shelter Sector Project); 7 integrated urban development projects in Indonesia (5) and Pakistan (2); and 3 regional development projects in Malaysia.

[24] The study used an area with comparable plot and house sizes and similar facilities in a new town built by the private sector.

[25] E. Field. 2003. *Entitled to work: Urban tenure security and labor supply in Peru.* Princeton University Research Program in Development Studies Working Paper No. 220, November.

welfare of children. Marcano and Ruprah (2008) found mixed results, with none of their results being statistically significant.

20. **Impact on health and satisfaction**. Cattaneo et al. (2009) evaluated the impact of a housing program in Mexico to replace dirt floors with cement floors for poor families. They found significant improvements in child health: 78% reduction in parasitic infestations, 49% reduction in diarrhea, 81% reduction in anemia, and 36–96% improvement in cognitive development. The same study found significant increases in adults' satisfaction with housing quality, and significantly lower rates of depression and perceived stress. Marcano and Ruprah (2008) reported positive but statistically insignificant impacts on their measure of child nutrition. Finally, Aiga (2003) documents the dramatic reduction in the incidence of diarrhea provided by access to clean water.[26]

21. **Impact on education of school-age children**. Mohanty and Raut (2009) studied the effect of home ownership on the academic achievement of children using panel income data from the United States.[27] They found no independent effect of home ownership, but significant effects of home environment, neighborhood quality, and residential stability on reading and math performance of children aged 3–12 years. Marcano and Ruprah (2008) found that Chile's Progressive Housing Program had a positive impact on children's school attendance. This effect was not statistically significant in 2004, but was significant in 2006.

22. **Impact on poverty.** Poverty reduction is a common community objective. Marcano and Ruprah (2008) detected a positive but statistically insignificant effect of Chile's Progressive Housing Program on poverty alleviation. However, they emphasized that the program's targeting efficiency was not good. In particular, eligibility requirements resulted in the poorest of the poor being excluded from the program.

23. **Impact on house market**. Home owners benefit from increases in property values. Sometimes, these increases can be attributed to a housing program (and spillovers) to improve housing quality. Lanjouw and Levy (2002) used hedonic regressions to estimate the program impact on house value and found that conferral of transferable property rights increased property values by 23.5% over conferral of non-transferable rights.[28] Implementing the double-difference method in a hedonic regression, Kiel and McClain (1995) estimated the impact of placing a public incineration facility in a neighborhood.[29] They found that by the time the facility was fully operational, house prices near the facility had been reduced by as much as 64% relative to prices of houses far away. Marcano and Ruprah (2008) described the effect of Chile's Progressive Housing Program on the housing shortage as "small" relative to the shortage and noted that progress against the shortage was eventually reversed as the new houses depreciated.[30]

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[26] H. Aiga. 2003. *Household water consumption and the incidence of diarrhea: lessons learned from a case of the urban poor in Manila.* Technical paper presented at WHO/EMRO Consultation Meeting on Minimum Household Water Security Requirements and Health, Amman, Jordan, 1–3 December, 2003.

[27] L. Mohanty and L. Raut. 2009. Home ownership and school outcomes of children. *American Journal of Economics and Sociology* 68 (2).

[28] J. O. Lanjouw and P. I. Levy. 2002. Untitled: a study of formal and informal property rights in urban Ecuador. *The Economic Journal*. 112 (482). pp. 986–1019.

[29] K. A. Kiel and K. T. McClain. 1995. House prices during siting decision stages: the case of an incinerator from rumor through operation. *Journal of Environmental Economics and Management.* Vol. 28. pp. 241–255.

[30] They defined the housing shortage as the share of houses that were (i) irreparable; (ii) overcrowded; (iii) lacking at least one utility connection (electricity, water, or sewage); or (iv) in need of major repair.

IV. IMPACT EVALUATION OF SRI LANKA HOUSING FINANCE

A. Evaluation Framework

24. The theoretical underpinning of LIH interventions stems from the theory of human motivation called "*Hierarchy of Needs*" that was proposed by Maslow (1943).[31] Essentially, it says that basic needs such as shelter must be satisfied before individuals can progress to higher-level needs. Individuals who are homeless, at risk of homelessness, or live in substandard housing face physical and physiological barriers to improving their economic and social well-being. Figure 1 shows the causal chain from housing loans to expected outcomes (a narrative description is in Appendix 3). It is expected that housing loans help the borrowers improve the physical conditions of their houses which, in turn, increase the value of their houses and provide the family with a more peaceful atmosphere. Improved physical housing conditions release household members, especially women, from time-consuming and burdensome tasks like fetching water and garbage disposal, and this may contribute to greater labor force participation among women. Improved physical housing conditions also release girls from duties related to maintaining lower-quality houses, thereby making them more ready to attend school. Finally, improved housing conditions reduce the exposure of household members to sources of diseases and thus, improve household health conditions. If frequency and duration of illnesses among children are reduced, then absenteeism from school should decline and study hours should improve.

25. The IES empirically assessed the extent to which housing loans affected the quality of life of the borrowers. Following Marcano and Ruprah (2008) and Field and Kremer (2006), the IES estimated the project impact on households and discussed aggregate changes observed within the community. The household impacts were measured in terms of (i) housing quality, (ii) per capita household expenditure and income, (iii) household completeness (presence of both spouses if formally married), (iv) labor force participation (percentage of working household members of working age), (v) education of school-age children, and (vi) health indicators (health expenditure per capita, illness or injury incidence, frequency and duration, and proportion of stunted and underweight children). Following Marcano and Ruprah (2008), housing quality was measured by a housing quality index (HQI). The index has eight dimensions: (i) access to potable water, (ii) access to electricity, (iii) having sanitary garbage disposal, (iv) having permanent walls, (v) having permanent floors, (vi) having a permanent roof, (vii) having a sanitary toilet, and (viii) not being overcrowded (i.e., not more than two persons per bedroom).[32]

$\mathrm{HQI}=\sum_{i}\frac{a_i}{8}$, where a_i runs through the eight conditions; $a_i = 1$ if the house satisfies condition i, and zero otherwise. In defining permanent walls, floors, and roofs, the definitions of the Sri Lanka Census 2001 were adopted.[33] Appendix 4 presents the evaluation logic model linking project inputs and activities with outputs, outcomes, and potential impacts.

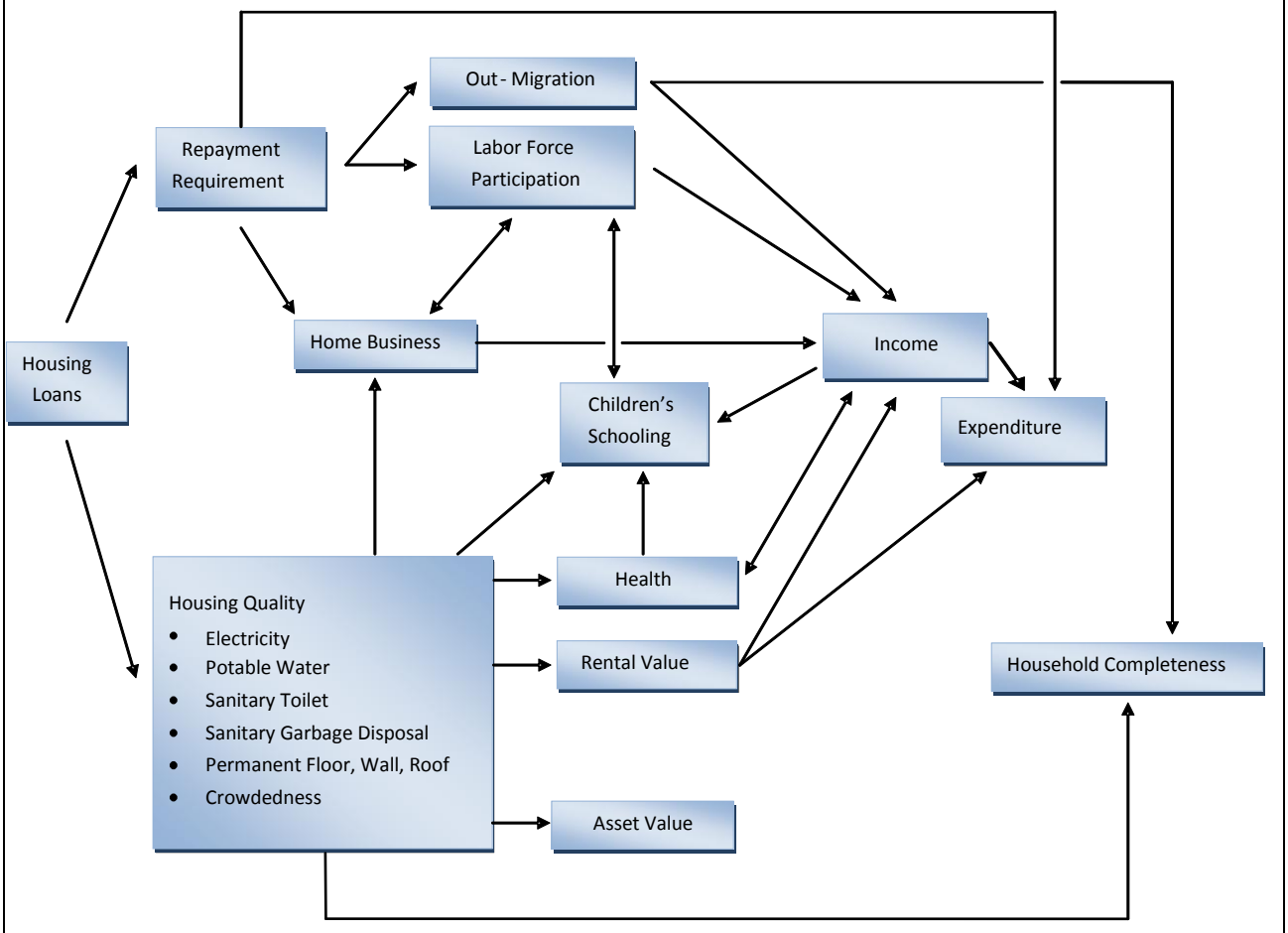
B. Estimation Methods

26. The evaluation approach paper proposed using the regression discontinuity design method to estimate the project impacts.[34] This method requires precise measurement of the

[31] A. H. Maslow. 1943. A Theory of Human Motivation. *Psychological Review*. 50 (4) (1943). pp. 370–396.
[32] This is the median number of persons per bedroom from the Sri Lanka Household Income and Expenditure Survey 2007.
[33] As defined in the concepts and definitions in the Sri Lanka Census of Population and Housing 2001.
[34] Loan 1632-SRI: Urban Development and Low-Income Housing Project. Housing Finance Impact Evaluation–Evaluation Approach Paper, 5 October 2010.

treatment-determining variable at the start of the project for both the treatment and control groups (monthly household income in this case). It also requires a strict enforcement of the eligibility criteria and a sufficient number of treatment and control households around the cutoff value of the treatment-determining variable. Efforts to retrospectively collect such data for non-project/control households failed. The *grama niladharis* (GNs) interviewed during the pre-testing mission (25 November–7 December 2010) revealed that they did not have records of actual household income data in 1998 but could only approximate household income of households in their divisions.[35] In addition, an examination of the data submitted by the PCIs showed that 63 households (0.4%) received the loans even though their monthly income was above the cutoff of SLRs12,500, constituting a minor violation of the project eligibility rule. Appendix 5 gives details of the data submitted by the PCIs.

Figure 1: The Causal Chain



Source: Asian Development Bank Independent Evaluation Department, illustration based on literature review.

27. The IES adopted another quasi-experimental approach, the matched single-difference estimation method. This estimation method is done by finding non-project households that were

[35] The administrative structure of Sri Lanka is as follows: national, province, district, divisional secretariat (DS), and *grama niladhari* (GN) division—the officials of the latter being *grama niladharis* (GNs). The GN division is the lowest formal administrative unit.

similar to project households before the project and then comparing the outcomes of the two groups after the project. Since baseline data on household income were not available, divisional secretariat (DS) officers were first asked to select within their DS comparison GN divisions that were similar to the project GN divisions, except that they had few or no project borrowers. Then the GNs were asked to identify, from the selected comparison GN divisions, households that were similar to the project households before the project started. In particular, the GNs were asked to indicate comparison households that were similar to sampled project households on the basis of five characteristics in 1998: (i) household income, (ii) household size, (iii) age of household head, (iv) education of household head, and (v) occupation of household head. If this process is successful, comparison of outcomes between treatment and control households will be a valid estimate of the impact of the project, provided there is no selection bias related to variables other than these five. Details about data sources are provided in Appendix 6.

28. Given matched households, the impact estimate $\hat{\tau}$ is calculated as[36]

$$\hat{\tau} = \frac{1}{N}\sum_{i=1}^{N} Y_i^1 - \hat{Y}_i^0$$

where:

Y_i^1 = Outcome for the i[th] treatment household.

$\hat{Y}_i^0$ = Estimated average outcome from the matched comparison households for i[th] treatment household. The IES averaged four nearest matches.[37]

N = Number of treatment households.

29. Matches can be based on direct covariate matching or propensity score matching.[38] Propensity score matching has the advantage of reducing the multidimensional covariate matching problem into a uni-dimensional problem using propensity scores (Rosenbaum and Rubin 1983, 1985).[39] It has been shown that, under the assumption of (i) exogeneity of treatment assignment conditional on observed covariates and (ii) presence of overlap in the distribution of the treatment and control groups' propensity scores, matching on the propensity score alone balances the multivariate distribution of observed covariates of the treated and control groups. However, Abadie and Imbens (2006) argue that the usual method of computing standard errors for this method is not always correct and has no conceptual basis.[40]

30. The IES used the nearest-neighbor direct covariate matching method implemented via *nnmatch* in Stata software.[41] This routine corrects for the bias that arises when matching on multiple covariates/characteristics, and also estimates the standard errors correctly (Abadie et

[36] This is known as the average treatment effect on the treated; see, for example, G. Imbens. 2004. Nonparametric Estimators of Average Treatment Effects under Exogeneity: A Review. *The Review of Economics and Statistics*. 86 (1). pp. 4–29.

[37] In principle this could be a weighted average with weights proportional to "closeness" of match.

[38] The propensity score is the probability of being treated given characteristics X, or P(T=1|X) where P(.) is the probability function, T=1 represents getting treatment, and X is the vector of observable characteristics. The estimating function for P(.) can be a logit or probit.

[39] P. R. Rosenbaum and D. B. Rubin. 1983. The Central Role of the Propensity Score in Observational Studies for Causal Effects. *Biometrika*. 70 (1). pp. 41–55. P. R. Rosenbaum and D. B. Rubin. 1985. The Bias Due to Incomplete Matching. *Biometrics*. 41 (1). pp. 103–116.

[40] A. Abadie and G. W. Imbens. 2006. On the Failure of Bootstrap for Matching Estimators. *Econometrica*. 76 (6). pp. 1537–1558.

[41] The Stata command is *nnmatch* and is a user-contributed routine.

al. 2004).[42] The metric used to find the optimal matching is the Euclidean distance function standardized by the inverse of the diagonal of the covariance matrix of the matching variables.

31. One critical question in matching is which elements of the covariate matrix can be used for matching. In other words, what household characteristics would have to be used to match project and non-project households. The valid matching variables would be characteristics that are not affected by participation in the project (or the anticipation of it). Caliendo and Kopeinig (2008) recommend using variables that are either fixed over time or measured before the intervention.[43] Since there was no baseline data but only a post-intervention survey data, the IES chose household characteristics that were deterministic or reliably determined pre-1998. After examining a combination of possible matching variables for each outcome indicator to check the robustness of the estimation results, the IES resolved to use four individual characteristics of the household head (age, education, employment sector, and sex) and three household characteristics (family size before 1998, household rural–urban location, and GN division).[44] Community variables that are not likely to be affected by the project could have been used as part of the matching variables. However, because of the dispersion of beneficiary households, not all communities where there are beneficiaries were covered by the community survey. This restricted the use of community data for matching.

32. A second critical question is whether the matching estimates are susceptible to selection bias due to unobservable differences between the project/treatment and non-project/control households. It is possible that the project/treatment households exhibit selectivity when compared with the non-project/control population. In particular, project/treatment households may possess stronger desire to improve their homes, or they may be better informed, more motivated, or creditworthier when it comes to borrowing to improve their homes.

33. Based on the FGDs and KIIs, it seems plausible to assume that nearly all Sri Lankan households do want to own and improve their houses. The three case studies in Appendix 7 reflect strong desires to have housing that provides a good environment for children.[45] However, only 36% of the control sample did borrow (from other sources) to improve their homes. To control for unobservable differences (information, motivation, and creditworthiness) between the treatment and control households, the subset of control households that actually borrowed to improve their homes may be the appropriate source of matches for treatment households.

34. To formally check for selection biases, the IES used a Hausman test with the statistic:

$$\frac{(\hat{\tau}_1 - \hat{\tau}_2)^2}{\text{var}(\hat{\tau}_1) - \text{var}(\hat{\tau}_2)}$$

[42] A. Abadie et al. 2004. Implementing Matching Estimators for Average Treatment Effects in Stata. *The Stata Journal*. 4 (3). pp. 290–311.

[43] M. Caliendo and S. Kopeinig. 2008. Some Practical Guidance for the Implementation of Propensity Score Matching. *Journal of Economic Surveys*. 22 (1). pp. 31–72.

[44] The employment sector was defined by agriculture, industry, services, and not working. The family size was computed based on the birth date of children. We were unable to control for changes due to marriage, divorce, death, etc.

[45] One informant revealed during the interview that in Sri Lanka, owning a house and improving it was seen as investing in an asset that has both economic and social value. Hence, the aspiration, particularly of low-income and middle-income households, was to own a house and to continually improve it as savings or access to credit become available. The survey team observed that most of the migrant workers working in the Middle East invest in housing instead of spending on anything else.

where $\hat{\tau}_1$ is the impact estimated by using all control households as potential matches; $\hat{\tau}_2$ is the impact estimated by using only those control households that did borrow for home improvement; and var(.) is the estimated variance of the statistic in parentheses.

35. Under the null hypothesis of no selection bias, this test statistic is asymptotically distributed as chi-square with 1 degree of freedom, and both estimators are consistent but $\hat{\tau}_1$ is relatively efficient because of the larger sample of control households from which to draw matches.[46] Under the alternative hypothesis, only $\hat{\tau}_2$ is consistent. Outcomes with small p-values lead to rejection of the null hypothesis.

C. Data Sources

36. The IES collected four sets of data from: (i) a survey of 1,011 households that borrowed housing loans from the project and 1,011 comparison households that did not borrow (treatment and control samples were drawn from the project/treatment and non-project/control GN divisions in the same divisional secretariat, as described in Appendix 6, and the sample households were drawn from five out of nine project provinces, with sampling probability proportional to the number of loans in the respective provinces); (ii) a survey of 15 GN divisions that had borrowing households and 15 GN divisions with no borrowing households; (iii) 50 KIIs with officials from the CBSL, PCIs, and local governments, and community leaders; and (iv) 30 FGDs involving members of borrowing and non-borrowing households. Table 4 presents the distribution of surveyed households, communities, KIIs, and FGDs.

Table 4: Sample by Type of Data Collection

		Household Survey		Community Survey			
Province	**District**	**Treatment**	**Control**	**Treatment**	**Control**	**FGD**	**KII**
North Central	Anuradhapura	102	102	2	2	6	10
Sabaragamuwa	Rathnapura	87	87	1	1	6	10
Western	Colombo	207	207	3	3	6	10
Central	Kandy	286	286	4	4	6	10
Southern	Hambantota	329	329	5	5	6	10
Total		**1,011**	**1,011**	**15**	**15**	**30**	**50**

FGD = focus group discussion, KII = key informant interview.
Source: Asian Development Bank Independent Evaluation Department calculations based on loan data provided by participating credit institutions.

37. The household survey collected household data on (i) location, (ii) demographics, (iii) education and literacy, (iv) health, (v) economic activity, (vi) housing conditions, (vii) household assets, (viii) household expenditures, (ix) household income, (x) credit, (xi) savings, (xii) insurance, (xiii) risk coping, (xiv) welfare indicators, and (xv) project-related information. These were designed to cover the information requirement identified in the logic model of the evaluation.

38. The community survey collected community data on (i) physical characteristics, (ii) demographics and resources, (iii) housing, (iv) proximity to basic services and service institutions, (v) natural disasters, and (vi) changes in living conditions and projects. Unfortunately, due to a wide dispersion of beneficiary households, not all their communities were covered by the community survey. The KIIs were designed to investigate general economic and housing-related issues, and project-related issues. The FGDs were designed to investigate the importance of housing development and the challenges faced by people in

[46] W. Greene. 2003. *Econometric Analysis*. 5th Edition. p. 81.

meeting their housing needs. Appendix 6 describes details of the sampling method, the surveys, KIIs, and FGDs conducted.

V. DESCRIPTIVE DATA ANALYSIS

A. Loan Characteristics

39. The PCR (p. 33) indicated that the terms of the housing loans were adjusted in year 2000 to (i) increase the maximum loan from SLRs100,000 to SLRs200,000, (ii) raise the monthly income threshold for eligibility from SLRs8,500 to SLRs12,500, (iii) extend the maximum loan repayment period from 10 years to 15 years, and (iv) add house purchase as an eligible purpose. Table 5 shows the distribution of loans by approval date in two loan disbursement periods, 1998–2000 and 2001–2007. Valid loans include only loans that were no greater than the maximum allowable loan amount in each period. We know neither the month in which the new loan terms became effective nor the month in which any particular loan was approved. We therefore allocate a valid loan dated in year 2000 to the period 1998–2000 if the loan amount is no greater than SLRs100,000, or to the period 2001–2007 if the loan amount is greater than SLRs100,000 but no greater than SLRs200,000.[47] As the project was approved by ADB's Board in 1998, loans received before 1998 must have come from other sources. Although the project was closed in June 2005, the loan funds remained with the PCIs, which allowed them to lend after 2005. The cutoff of 2007 was made to allow some time for the project impact to emerge until the survey for this study was taken (December 2010–March 2011). Subsequent analysis will only include 958 sampled borrowers with valid loans from 1998 to 2007.

Table 5: Loans per Year of Approval

Year Approved	Number of Loans	Percent	Valid Loans	Percent
Before 1998	3	0.30	0	0.00
1998–2000	254	10.98	178	18.45
2001–2007	747	88.03	780	80.83
After 2007	7	0.69	7	0.76
Total	**1,011**	**100.00**	**965**	**100.00**

Source: Asian Development Bank Independent Evaluation Department estimates based on the household survey data.

40. Table 6 presents the sample median, average, and maximum loan amounts of valid loans in the study period 1998–2007. The loans were disbursed over a period of relatively high inflation. To make average and median loan amounts comparable to nominal amounts that households reported at the beginning of 2011, loan amounts were adjusted using Sri Lanka's gross domestic product deflator for corresponding loan disbursement years.

Table 6: Loan Amounts (SLRs)

	1998–2000		2001–2007		All	
Statistic	**Nominal**	**In 2010 SLRs**	**Nominal**	**In 2010 SLRs**	**Nominal**	**In 2010 SLRs**
Median	100,000	252,000	100,000	196,650	100,000	197,000
Average	77,532	203,650	96,569	199,408	93,032	200,196
Maximum	100,000	281,000	200,000	504,000	200,000	504,000
Number of households	178	178	780	780	958	958

SLRs = Sri Lanka rupees.
Source: Asian Development Bank Independent Evaluation Department estimates based on the household survey data.

[47] This allocation in effect means that the 1998–2000 group is 1998–2000$^{(-)}$, i.e., exclusive of loans approved in 2000 that were larger than SLRs100,000; while the 2001–2007 group is 2001$^{(+)}$–2007, i.e., inclusive of loans approved in 2000 that were greater SLRs100,000 but no larger than SLRs200,000.

41. As for loan purpose, Table 7 shows that the most common purposes were improving (extending and renovating) a house (82%), constructing a new house (13%), and purchasing land (3%). This virtually replicates the 99% attributed to these three loan purposes noted in the PCR (p. 33). The fact that the program loans were mainly used to improve existing houses is not surprising, because the loans were small relative to the average value of houses. The overall average loan was SLRs93,032 (SLRs200,196 in 2010 value), while the average sale value of houses was about SLRs4.4 million for the treatment groups and SLRs2.9 million for the control groups (Appendix 8).

Table 7: Loan Purposes

	1998–2000		2001–2007		All	
Loan Purpose	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Construction of new house	22	12.36	104	13.33	126	13.15
Extension or renovation	142	79.78	640	82.05	782	81.63
Land purchase	10	5.62	22	2.82	32	3.34
Service connections	2	1.12	2	0.26	4	0.42
House purchase	2	1.12	7	0.90	7	0.73
Others	0	0.00	5	0.64	7	0.73
Total	**178**	**100.00**	**780**	**100.00**	**958**	**100.00**

Source: Asian Development Bank Independent Evaluation Department estimates based on the household survey data.

42. Table 8 shows loan maturities. Most households borrowed for a term of 0–5 years. The proportion of loans with maturity exceeding 10 years was very small in both loan periods.

Table 8: Loan Maturities

	1998–2000		2001–2007		All	
Loan Maturity (years)	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
0–5	133	74.72	624	80.00	757	79.02
5–10	32	17.98	111	14.23	143	14.93
10–15	7	3.93	34	4.36	41	4.28
15–20	0	0.00	2	0.26	2	0.21
Missing	6	3.37	9	1.15	15	1.57
Total	**178**	**100.00**	**789**	**100.00**	**958**	**100.00**

Source: Asian Development Bank Independent Evaluation Department estimates based on the household survey data.

B. Characteristics of Sampled Project Households

43. The loan records submitted by the PCIs showed that less than 1% of borrowers were in the lowest 10% income group with monthly household income less than SLRs2,500, while about 60% were in the SLRs5,000–SLRs10,000 income bracket and about 25% were in the SLRs10,001–SLRs12,500 income bracket (Appendix 5, Table A5.2). The sample distribution of income at the time of the survey is given by loan disbursement period in Table 9. The kernel density estimates of the log monthly household income and the income growth against quantiles of the distribution are presented in Figure 2. The densities were produced by Stata's *kdensity* routine using the Epanechnikov kernel with bandwidths of 0.16, 0.12, and 0.055 respectively for the 1998–2000 borrowers, 2001–2007 borrowers, and for incomes at the application time provided by the PCIs. The incomes reported at the application time were adjusted to the 2010 level using Sri Lanka's gross domestic product deflators for corresponding loan disbursement years. Income growth was calculated for each quantile q of the log-income distribution by

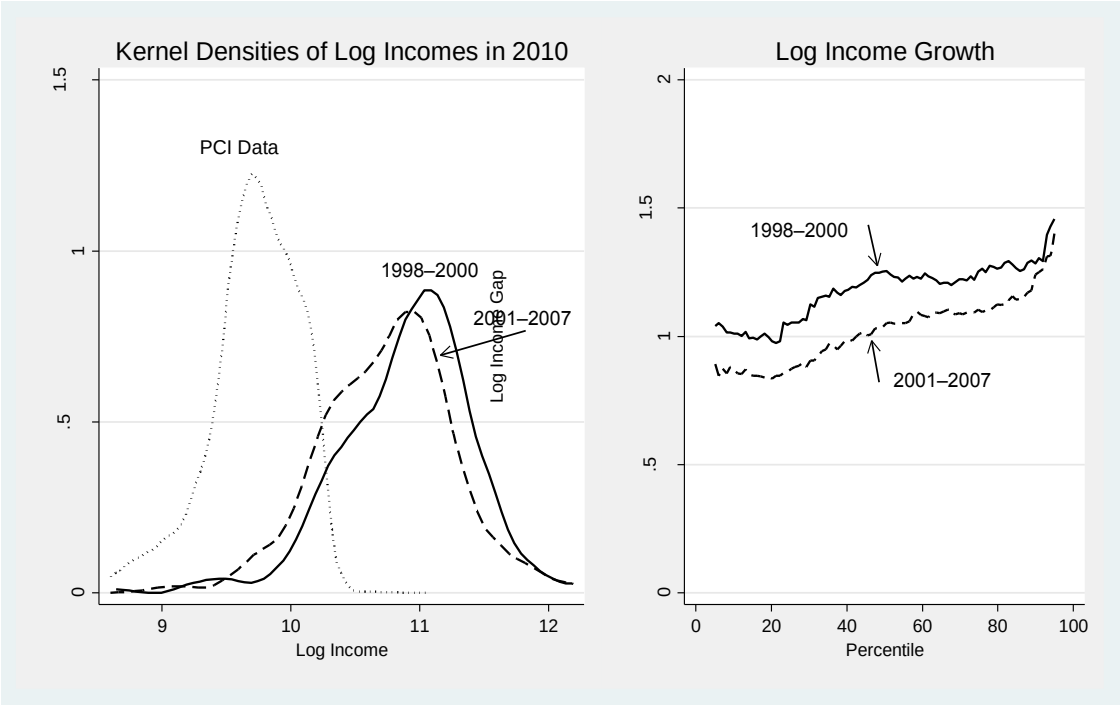
subtracting the q^{th} quantile of the log income at the time of application from the q^{th} quantile of log income in 2010 for each earlier and later borrower group. The figure shows improvement in household income, and the income growth of the early borrowers was higher than that of the later borrowers.

Table 9: Sample Household Per-Capita Monthly Income

	1998–2000		2001–2007		All	
Income (SLRs)	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Less than 2,500	3	1.69	4	0.51	7	0.73
2,501–5,000	7	3.93	46	5.90	53	5.53
5,001–7,500	15	8.43	107	13.72	122	12.73
7,501–10,000	24	13.48	120	15.38	144	15.03
10,001–12,500	19	10.67	140	17.95	159	16.60
Above 12,500	110	61.80	363	46.54	473	49.37
Total	**178**	**100.00**	**780**	**100.00**	**958**	**100.00**

SLRs = Sri Lanka rupees.
Source: Asian Development Bank Independent Evaluation Department estimates based on the household survey data.

Figure 2: Log Monthly Household Income



PCI = participating credit institution.
PCI Data = distribution of income at loan application time based on data submitted by PCIs.
1998–2000 = distribution of surveyed income for households with loans approved during 1998–2000.
2001–2007 = distribution of surveyed income for households with loans approved during 2001–2007.
Source: Asian Development Bank Independent Evaluation Department estimates based on the household survey data.

44. When asked to rate from 1 to 10 the satisfaction with the quality of their house, about two-thirds of the sampled project households were satisfied and gave a rating of at least 8 (Table 10). Among those who were not satisfied, 40% indicated they wanted more spacious housing. The earlier loan-disbursement group was slightly less satisfied than the later one.

Table 10: Satisfaction with Housing Quality

	1998–2000		2001–2007		All	
Response	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Satisfied	116	65.17	523	67.05	639	66.70
Not Satisfied	46	25.84	201	25.77	247	25.78
Missing	16	8.99	56	7.18	72	7.52
Total	**77**	**100.00**	**780**	**100.00**	**958**	**100.00**

Note: "Satisfied" indicates a rating of at least 8 out of 10 on a 10-point scale.
Source: Asian Development Bank Independent Evaluation Department estimates based on the household survey data.

45. Table 11 shows a simple comparison between the treatment and control households by the matching variables. It shows that treatment and control households are statistically different except for family size before 1998 (p-value less than 0.05 is the conventional indicator of statistical significance), indicating that the cursory matching done in the field based on local knowledge of GNs about the respondent households was not successful. This can be partly explained by the fact that many of the GNs were new and hardly knew the household respondents. A simple comparison in means of outcome variables between the treatment and control households is presented in Appendix 8.

Table 11: Comparison of Treatment and Control Households

	Mean				
Variable	**Treatment**	**Control**	**Difference**	**t-value**	**p-value**
Sex of household head	1.083	1.131	(0.047)	(3.329)	0.001
Age of household head	51.830	49.905	1.925	3.691	0.000
Education of household head	12.856	11.018	1.838	16.383	0.000
Urban location	0.581	0.675	(0.094)	(4.276)	0.000
Proportion unemployed	0.178	0.214	(0.036)	(1.974)	0.049
Proportion in agriculture	0.105	0.205	(0.099)	(6.022)	0.000
Proportion in industry	0.278	0.385	(0.107)	(4.998)	0.000
Proportion in services	0.439	0.197	0.242	11.854	0.000
Family size before 1998	3.589	3.574	0.016	0.256	0.798

( ) = negative.
Source: Asian Development Bank Independent Evaluation Department estimates based on the household survey data.

VI. IMPACT ESTIMATION RESULTS

46. This section shows the impact estimation results for the six household welfare outcomes using the matching estimation method. The welfare indicators are: (i) housing quality index (HQI), (ii) per capita household expenditure and income, (iii) household completeness (presence of both spouses if formally married), (iv) labor force participation (percentage of working household members of working age), (v) education of school-age children (5–19 years old), and (vi) health indicators. Detailed definitions of outcome variables and data used for the estimation are in Appendix 9.

A. Matching Estimation

47. Given the disparity between the treatment and control households, the difference in outcome between the two groups also includes the effect of the difference in the household characteristics. To remove this difference in the treatment effect, we used matching households

from the data. In particular, the matching was based on the age, sex, employment sector, and educational attainment of the household head, household location (GN division, and rural–urban), and the family size before 1998. For each outcome, we estimated the impact in two ways: by using all control households as potential matches, and by using only control households that had borrowed for home improvements. We used the Hausman test to test whether the difference between these matching estimators was statistically significant at the 30% significance level.[48]

48. To see the effect of education, households were classified according to education of the household head as (i) completion of secondary schooling, and (ii) college (i.e., schooling beyond secondary and at least some college). Table 12 shows the distribution of the households by education of household head for the treatment and control groups.

Table 12: Distribution of Households by Education of Household Head

Education of Household Head	Treatment	Control	Total
Secondary	473	824	1,297
College (Beyond Secondary)	485	187	672
Total	**958**	**1,011**	**1,969**

Source: Asian Development Bank Independent Evaluation Department estimates based on the household survey data.

49. One potential source of differential impact is the loan term. For a given loan amount, a shorter loan term would mean a higher periodic repayment burden. We analyzed this possibility by grouping loans with terms no longer than 5 years and with terms longer than 5 years. Table 8 shows that 79% of loans in the survey have a 5-year term or shorter. Similarly, loan use may affect the impact. Due to sample size limitations, we analyzed only the two most popular loan uses—extension or renovation of the house and construction of a new house, which together cover 94.7% of the borrowers in the survey (Table 7). Finally, the length of time was also analyzed, since the loan release may have also caused differential impacts.[49] To see this, we analyzed loans in two groups, 1998–2000 and 2001–2007, respectively covering 18% and 81% of all valid loans (Table 5).

50. The matching estimates shown subsequently are the results of nearest-neighbor matching with four matches for every treatment households estimated using the *nnmatch* routine in Stata. For each outcome, we estimated the overall average impact, then the impacts for subsets of the data defined by education of the household head, by loan term, by loan use, and by loan release period.

B. Impact Estimates

51. Appendix 10 presents the Hausman test statistics and their p-values. Appendix 11 presents the impact estimation results that are consistent with the outcomes of the Hausman

[48] We chose a relatively high significance level to increase the power of the test. If the null hypothesis of no selectivity is true, but we reject it, we have committed a Type-I error, with the consequence that we mistakenly prefer the relatively inefficient estimator based on the restricted control sample. On the other hand, if the hypothesis of no selectivity is false, and we fail to reject it, we have committed a Type-II error, with the consequence that we mistakenly prefer the inconsistent estimator based on the unrestricted control sample. We exploit the tradeoff between the α-risk of Type-I error and the β-risk of Type-II error to reduce the probability of making the Type-II error, as that is the more serious one.

[49] E. King and J. Berhman. 2009. Timing and Duration of Exposure in Evaluations of Social Programs. *World Bank Research Observer*.

tests. In particular, if p-value ≤ 0.30, the test rejects the null hypothesis of no selectivity. In such cases, we present the estimation results produced using the subset of control households that had borrowed for home improvement (shaded cells). Otherwise, the test fails to reject the null hypothesis and we present the estimation results produced using all control households (clear cells). For readers interested in both estimated impacts, estimation results can be provided upon request.[50] The discussion in this section refers to the matching estimation results presented in Appendix 11, under the conventional significance level of 5%.

52. **Impact on housing quality.** The matching estimate of the overall average treatment effect for HQI is small but significant at 5% (Appendix 11, Table A11.1). The estimated impact on HQI is slightly larger and statistically significant for the lower education group, but it is not statistically significant for the higher education group. As shown in the causal chain (Figure 1), the impact of a housing loan on HQI is direct. However, almost all treatment and control households do possess the elements enumerated in HQI (Appendix 8), so there is little room for HQI to rise. Moreover, if a given household improvement involves only one or two of the HQI elements, the effects of those improvements are diluted by being averaged with the other HQI elements, making the average impact small. On the other hand, the estimated treatment effect on the current asset value of the house is large, but not statistically significant. The estimated program impact on current rental value is large and statistically significant only for the higher education group.

53. When disaggregated by loan characteristics (Appendix 11, Table A11.2), the estimated impact on HQI is statistically significant for both loan terms, but it is larger for longer loan terms. The impact on HQI is slightly statistically significant when loans were used for extension and/or renovation, but not when loans were used for new construction. By loan disbursement period, the estimated impact is slightly statistically significant only for the later period. None of the estimated impacts on current asset value of the house are statistically significant. Similarly, the impacts on current rental value are statistically insignificant in all cases, except for extension and/or renovation loan uses and the earlier loan disbursement period.

54. **Impact on household expenditure and income**. The matching estimates of average impact on per capita household monthly expenditure and per capita household monthly income are SLRs739 and SLRs1,098, respectively (Appendix 11, Table A11.1). Note that the mean values of household expenditure and income for our treatment households are SLRs12,445 and SLRs14,616, respectively (Appendix 8), so the estimated impacts are economically substantial. This contrasts with the ADB (1997) study in which the consumption expenditure indicator appeared to be better in the comparison groups. When the estimation is disaggregated by education of the household head, the statistical significance at 5% disappears. Note that the impact on income is stronger, significant at 5% overall and at 10% for the less well-educated group.

55. The estimation results show that the impacts on household expenditure and income differ by loan characteristics (Appendix 11, Table A11.2). The impact on per capita expenditure is highly significant for longer-term loans, which could reflect the fact that households with longer-term loans are still repaying them, and for the earlier disbursement period. The impact on per capita income is significant for the extension and/or renovation loan use and for both

[50] While we do not discuss the comparison between the unrestricted estimates and the restricted, it is worth noting one general observation. The restricted impact estimates are generally smaller and less statistically significant than the unrestricted impact estimates. This is as expected, since control households that had borrowed for home improvement are more similar on average to the treatment households than the non-borrowing control households.

disbursement periods (although less so for the early disbursement period). One interpretation of the positive project effects on expenditure is that they are "accounting artifacts" related to the fact that loan payments are counted as expenditures. Higher loan payments required of treatment households could easily account for the estimated project impact.[51]

56. **Impact on household completeness.** The matching estimates of the project impact on household completeness contrast with the simple difference of household completeness across the treatment and control groups. The matching estimates are small and they are not statistically significant for the overall average, nor by loan term, loan use, and loan period (Appendix 11, Table A11.1). These estimation results are consistent with the ambiguity we described in the causal chain analysis. On the one hand, home improvement may make it more comfortable for couples to occupy a given house (particularly if the improvement involved additional sleeping rooms). But, on the other hand, the loan repayment requirement may result in more (or extended) out-migration in order to earn more.

57. **Impact on labor force participation**. The matching-estimated impacts on labor force participation rates (Appendix 11, Table A11.1 and Table A11.2) are different compared with the simple mean differences (Appendix 8). While the average impact is positive and highly significant on women, it is positive but insignificant on the overall labor force participation (both genders) and on men. For the lower education level, none of the impacts is statistically significantly different from zero. In contrast, in the higher education level households, the estimated program impact is large (10%) and highly statistically significant for women, and this made the positive and significant impact on women's average labor force participation.

58. When disaggregated by loan features, the positive and significant effects on women generally persist, as do the positive and insignificant effects on men (Appendix 11, Table A11.2). The impacts on overall labor force participation (both genders) is generally positive, though with mixed significance. The generally positive effects on labor force participation are consistent with the causal chain analysis presented (Figure 1 and Appendix 3). The repayment requirement attached to loans and the possibility that home improvement can provide room for a home-based enterprise suggest increasing labor force participation.

59. **Impact on education.** None of the estimated average project impacts on the proportion of boys or girls attending school, their study time per day, and their absenteeism is statistically significant at the 5% level (Appendix 11, Table A11.1). When the results are decomposed by education of the household head, the absenteeism for boys fall statistically significantly. The impact on girls' attendance becomes positive and statistically significant for both education groups, while the average study hours per day only significantly improves for the higher education group, and the absenteeism is sharply and significantly reduced only among girls from the lower education group.

60. When disaggregated by loan term, loan use, and loan period (Appendix 11, Table A11.2), the project impacts are generally not beneficial for boys, except for an improvement in attendance for longer loan terms, for construction of new houses, and a reduction in absenteeism for shorter loan terms, for extension and/or renovation loan uses, and for earlier loan period. The estimated impacts on girls are slightly better than those on boys,

[51] At the survey time, the average outstanding balance held by treatment households was SLRs66,345 and that held by control households was SLRs27,556. Assuming 10% interest rates, as reported in the PCR, and the sample median 5-year terms, treatment households' monthly payments averaged SLRs1,410 and control households' monthly payments averaged SLRs585. The difference was SLRs825.

although they remain quite mixed. Our causal chain analysis identified three factors that would be unambiguously beneficial for children's education: better housing, better health, and higher income, and a factor that could be regarded as ambiguous: higher labor force participation by parents could boost schooling indirectly through higher income, but it could also be detrimental to schooling if working parents imposed additional household duties on children. The relatively weak results could be due to an effect similar to that we described for HQI, i.e., the households in our samples are relatively well-off and children's school attendance, study hours, and attendance were already very good, so there is little room for the project to generate improvements.

61. **Impact on health**. None of the estimated average project impacts on the health indicators is statistically significant, except for the proportion of family members ill or injured during the 6 months preceding the survey (Appendix 11, Table A11.1). The estimated impacts are slightly more beneficial for the higher education group, where the proportion of the ill or injured in the past 6 months and mean days of the last episode of illness or injury was significantly reduced, while for the lower education group only the health-care expenditures were significantly reduced. No beneficial effects are observed for the proportions of children that are stunted or underweight.

62. The disaggregated estimated impacts by loan characteristics are in Appendix 11, Table A11.2. While the estimated impacts on health expenditures are negative, they are statistically insignificant in all cases. On the other hand, beneficial impacts are observed for the proportion of the ill or injured across the board, with a single exception. The impacts on the frequency of illness or injury in the past 6 months appear to be significantly beneficial only for loans disbursed in the earlier period. The impact on the mean number of days of the last episode of illness or injury appears to be significantly reduced only for loans in the earlier period. However, it significantly increased for loans of longer terms (42 days) and for loans used to construct new houses (39 days). We believe that these particular results are anomalous and are due to the very small sample sizes—only 20 treatment observations and 25 control observations were available (Appendix 9). Like the impact on health expenditures, no impact is observed on the proportions of children stunted or underweight across the board. Overall, the beneficial treatment effects on health indicators are consistent with the description we provided in our causal chain analysis: better housing leads directly to better health because it reduces exposure to the elements and sources of disease.

63. In summary, the impacts on the housing physical conditions and on household expenditure and income are generally more robust than the impacts on higher-order welfare measures related to education, health, and labor force participation. We conjecture that this is related to the fact that the income distribution among project households is concentrated toward the right-hand side of the range from 0 to 55th income percentile (i.e., near middle income), instead of at the very low end of the income distribution. The treatment and control households in our sample are generally not the very poor. Thus, they have generally good health, their children are enrolled in school, and the adults are well educated and working. It therefore seems unlikely that relatively modest loans for home improvement would exert substantial influence on higher-order welfare outcomes.

VII. COMMUNITY-LEVEL ANALYSIS

64. This section provides a descriptive analysis of community-level outcomes, using subjective opinions from the community officers, feedback from the FGDs and KIIs, and perceptions of respondents in the household survey. Community-level outcomes of interest

include poverty rates, employment opportunities, general level of health, school attendance, municipal service delivery, community participation, community peacefulness, and gender equality. Appendix 12 presents descriptions of the surveyed communities and detailed tabulations of survey responses.

65. GNs in 15 project communities and 15 non-project communities were asked a series of questions about aspects of the community quality of life in their divisions, comparing the present situation with the situation in 1998. In parallel, 50 KIIs and 30 FGDs were conducted to get supplementary information. Almost all the GNs indicated improvements in almost every outcome of interest, and there was no systematic difference between the two groups. The most obvious improvements were observed in school attendance, general health conditions, and gender equity. Employment opportunities, municipal service delivery, participation in community activities, and community peacefulness had a broader range of assessments, including "unchanged", "somewhat worse" or even "much worse" (Table 13).[52] Due to community data limitations, statistical analyses were not conducted to discern statistically whether the project communities improved more than the non-project communities, and whether the improvements were due to the housing loans. However, the GNs, KIIs, and FGDs attributed improvements in community quality of life mainly to greater employment opportunities and better local infrastructure generated by projects for job creation, infrastructure development, and poverty reduction. Housing loans were mentioned but were not prominent.[53]

Table 13: Response by *Grama Niladhari*s

Category	Quality of Life		Poverty		General Health		School Attendance		Employment Opportunities		Service Delivery		Community Partication		Gender Equity		Community peacefulness	
Response	**PC**	**NC**	**PC**	**NC**	**PC**	**NC**	**PC**	**NC**	**PC**	**NC**	**PC**	**NC**	**PC**	**NC**	**PC**	**NC**	**PC**	**NC**
Much Better	0	3	1	1	3	7	13	14	1	4	6	5	2	3	5	10	6	5
Some Better	15	12	12	14	12	8	2	1	12	10	7	9	5	7	9	3	4	9
Unchanged	0	0	2	0	0	0	0	0	1	0	1	0	1	3	0	2	1	1
Some Worse	0	0	0	0	0	0	0	0	1	1	1	1	6	2	0	0	4	0
Much Worse	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Total	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**14**	**15**	**15**	**15**

*Grama Niladhari*s (GNs) = *grama niladhari* division officers (*grama niladhari* division is Sri Lanka's lowest formal administrative unit), NC = non-project community, PC = project community.
Source: Asian Development Bank Independent Evaluation Department estimates based on the community survey data.

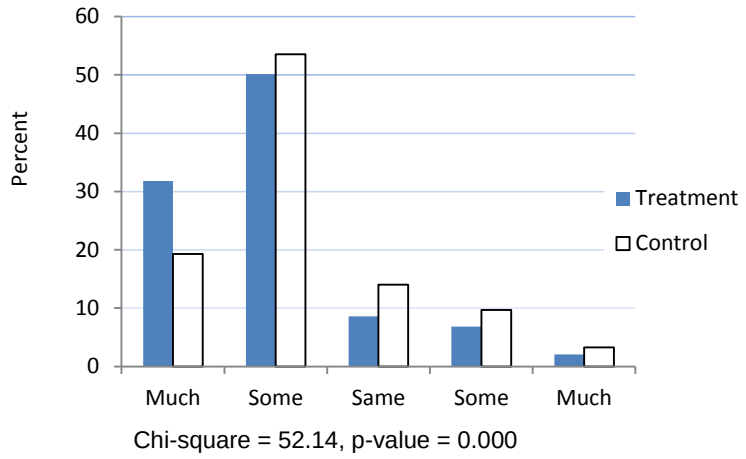
66. The household survey results complement the community survey results. Figure 3 shows the distribution of responses to the quality of life question among household heads. Overall, the picture is one of substantial improvements in quality of life since 1998. While 19% of non-project households reported "much better" quality of life, nearly 32% of project households

[52] Participants in FGDs reinforced the perception of dramatic improvements in quality of life. Many specifically mentioned improvements in housing conditions. In describing the impact of the project on the community, one participant said that "...people get their own houses...so this gives a very good psychological impact to the society." The FGDs also reinforced the notion that crime is down (sharply, according to some) and that communities feel "united" compared with 1998.

[53] GNs were also asked to list the three most important types of projects provided since 1998. Both treatment and control groups indicated that the most important projects were those focused on job creation, poverty reduction, and infrastructure development. Those were deemed to have made lasting contributions to the communities by overwhelming majorities (13 and 14 out of 15 communities in each treatment and control group).

did so. The Chi-square test indicates that the differences between the two groups are statistically significant.[54] The household survey also asked the respondent to report if his or her household was classified as poor by any of the government programs. Only 4.79% of the project households said "yes," compared with 17.71% of the non-project households. The observed differential may be due to the fact that very poor households were unable to qualify for project loans.

Figure 3: Perceived Change in Household Quality of Life



Source: Asian Development Bank Independent Evaluation Department estimates based on the household survey data.

67. Finally, we examined the effect of the project loans on the household credit portfolio of the borrowers. Appendix 12, Table A12.5 shows the distribution of the household credit portfolio of the sampled project and non-project households. The two groups have a similar number of loans from sources other than the project: 475 (project households) and 455 (non-project households). However, the average non-project loan amount of the project households was twice that of the non-project households. Aggregating all loans by household, the total credit obtained by project households was about 50% higher than the total credit obtained by those non-project households that did obtain credit. Only 1.24% of project households reported ever having a loan application rejected, versus 1.34% for the non-project households (Table 14).

Table 14: Household Credit Portfolio

		Treatment		
Item	**Control**	**Other Loans**	**Project Loans**	**All Loans**
Number of loans	455.00	475.00	878.00	1,353.00
Average loan amount (SLRs)	131,212.00	289,360.00	91,946.00	161,360.00
Average household total credit (SLRs)	166,299.00	156,710.00	91,946.00	248,656.00
Loan application rejected (%)	1.34	1.24	…	…

… = not applicable, SLRs = Sri Lanka rupees.
Note: Control households do not have project loans. All their loans are other loans.
Source: Asian Development Bank Independent Evaluation Department estimates based on the household survey data.

[54] The Chi-square test examines the similarity of the treatment and control distributions (with the null hypothesis that the two distributions are similar). Chi-square = 52.14 and p-value = 0.000 indicate that the two distributions are statistically different.

VIII. CONCLUSIONS

A. Key Findings

68. **Project beneficiaries.** Loan records and the household survey showed that only about 1% of the beneficiaries were from the lowest 10% income group with monthly household income below SLRs2,500, while about 60% were from the 30th to 40th percentile of the income distribution (SLRs5,000–SLRs10,000) and about 25% were from the middle income group (SLRs10,001–SLRs12,500). Feedback from the FGDs and KIIs reconfirmed that since households were required to meet conventional standards of creditworthiness, the project housing loans were not available to the very poor.

69. **Overall average household impacts.** Table 15 summarizes simple comparison and matching estimates of the average treatment effects. Simply comparing the means of the treatment and control households creates the appearance that the housing loans had significant positive impacts on most outcomes, except for the health indicators, days absent from school for boys, and proportion of men working. However, when treatment households are matched with control households, the number of significant comparisons is sharply reduced. In some cases, insignificant average treatment effects conceal treatment effects that are statistically significant for certain subsets of the data.

Table 15: Summary Estimation Results: Average Treatment Effect

Outcome	Simple Comparison[a]	Matching Estimate[b]
1. Housing quality index	***	**
2. Current asset value of house	***	0
3. Current rental value of house	***	0
4. Per capita monthly household expenditure	***	*
5. Per capita monthly household income	***	**
6. Proportion of complete households	**	0
7. Proportion of those working, aged 15–65	***	*
8. Proportion of males working, aged 15–65	–	0
9. Proportion of females working, aged 15–65	***	**
10. Proportion of males aged 5–19 attending school	**	0
11. Proportion of females aged 5–19 attending school	**	0
12. Study hours per day for males	**	0
13. Study hours per day for females	**	*
14. Days absent from school for males	0	*
15. Days absent from school for females	***	0
16. Per capita monthly health expenditure	0	0
17. Proportion of ill or injured in last 6 months	0	***
18. Frequency of illness or Injury in last 6 months	0	*
19. Number of days ill or injured last episode	0	0
20. Proportion of stunted children 0–5 years	0	0
21. Proportion of underweight children 0–5 years	0	0

[a] From Appendix 8.
[b] From Appendix 11, Table A11.1.

Notes:
1. 0 indicates not significant, * significant at 10%, ** significant at 5%, and *** significant at 1%.
2. – indicates the treatment group did significantly worse than the control group at the 10% significance level.

Source: Asian Development Bank Independent Evaluation Department estimates based on the household survey data.

70. **Housing conditions and quality of life.** The project's impact on the physical attributes of housing summarized in the HQI is positive and statistically significant. While the average project impact on rental value is statistically insignificant, this conceals the fact that the impact is statistically significant at 10% for the higher education group. The project did not have a statistically significant impact on the asset value of houses. According to the household survey, quality of life perceived by households increased substantially more for project beneficiaries than for non-beneficiaries.

71. **Household income and expenditure.** The project resulted in higher income per capita for project households and a slight increase in per capita expenditure (statistically significant at the 10% level). One potential explanation for the higher incomes is the higher labor force participation of women among the project households.[55] The impact on household income is mildly progressive, in that it is more pronounced for households with lower education, indicating the importance of targeting. The increase in expenditure among project households is statistically significant at the 5% level only among the borrowers of loans with terms of more than 5 years, and the subgroup with loans released in 1998–2000. Higher expenditure might be attributed to three sources: higher income, higher rental value for owner-occupied housing, and higher monthly payments on borrowing.[56] Since project households borrowed much more than non-project ones, it seems the latter source is likely to dominate in this data set.

72. **Household welfare.** The beneficial project impacts on education and health are limited to specific social groups, loan terms, loan uses, and the loan release period. The estimation results show a significant beneficial impact on school attendance and absenteeism for girls aged 5–19 when the data are disaggregated by education of the household head. In addition, the project had beneficial effects on girls' study hours, especially among girls from households in the higher education group. Finally, the program had a marginally significant beneficial impact on boys' absenteeism. Impacts on health indicators also were mixed, with a significantly lower proportion of household members becoming ill or injured and a significantly lower frequency of illness or injury; these impacts were strongest among households in the higher education group. The project had no significant impact on the completeness of households except for the high education group, where the statistical significance was modest. The population represented by our treatment and control samples, because it is not very poor, has relatively high higher-order welfare measures (Appendix 8). We therefore conjecture that this may partially account for the relatively modest project impacts we discerned.

73. **Access of low-income households to project housing loans.** The loan records provided by the PCIs and the household survey indicated that the project was implemented as designed. In particular, except for very few borrowers (63 households), the PCI records show that all borrowers had monthly income below the cutoff of SLRs12,500. The approved loan amounts ranged from SLRs10,000 to SLRs200,000, with only very few exceeding the ceiling of SLRs200,000. On the other hand, the PCI data indicated that only 1% of the beneficiaries were in the lowest 10% of the income distribution.

74. **Access to housing loans from other sources.** One of the project's key objectives was to increase access of low-income households to market-based housing finance through the formal sector. It appears that it achieved this objective. Not only did it issue 28,378 housing loans, but the beneficiary households appeared to have leveraged the project loans with loans

[55] This increase in the labor force participation result is contrary to the findings of an impact evaluation of Chile's Progressive Housing Program, but is consistent with the impact of land-tenure rights found in Peru.
[56] Rental value of owner-occupied housing is included in expenditure and income.

from other sources. The treatment and control households had similar numbers of loans from other sources. However, the treatment households' average loan from other sources was about twice that of the control households'. Likewise, the total credit obtained by treatment households during 1998–2011 was about 50% higher than that obtained by those control households that did get credit. The average credit secured by treatment households from all sources during the study period was nearly SLRs250,000, about triple the average project loan. Finally, only 1.24% of treatment households reported ever having a loan application rejected, versus 1.34% of the control households.

75. **Community impacts.** Our data were not sufficient to support a rigorous quantitative analysis of the project's impact on the community. Nonetheless, opinions from the community survey, KIIs, and FGDs revealed improvements in almost every category of the community quality of life. Most particularly, clear improvements were observed in school attendance, general health conditions, and gender equity. Effects were found less profound on employment opportunities, municipal service delivery, participation in community activities, and community peacefulness. Poverty incidence among the treatment households was much lower than among the control households, but this could be because the project targeting excluded very poor households.

B. Lessons

76. **Targeting the poor.** The project targeted households with incomes below the 55th income percentile. As households were required to meet conventional standards of creditworthiness, including having loan collateral, the project was in effect not available to the very poor. This was confirmed by the loan records from the PCIs and by the household survey data, with only about 1% of beneficiaries coming from the lowest 10% of the income distribution. The weak impact on households' labor force participation and welfare measures (education and health) may be due to the fact that most project beneficiaries were near middle-income households, whose labor force participation, schooling enrollment, and health conditions were already high. Targeting poorer households could make the project welfare impacts more robust.

77. **Loan amount.** The average loan was about SLRs91,000 at the approval time and SLRs200,000 in 2010 terms, or about 4.5% of the current house value. Even the maximum allowable amount of SLRs200,000 was too small to enable the borrowers to fundamentally change their housing conditions and proceed to meet higher-level household needs. This explains why most borrowers (81%) used the loan for renovating and extending their existing houses. On the other hand, as mentioned in the previous paragraph, the targeting reached households that were not very poor and already had high levels of school enrollment for their children and high levels of health in the family. The loan amounts supported by the project might have made much bigger differences to households further down the income distribution.

78. **Loan term.** Many project borrowers had loan terms no greater than 5 years. One would expect that a shorter loan term would put more amortization pressure on the borrowing households, especially low-income households, and that it would have a negative effect on household consumption and thus welfare. The IES showed that in several cases, the impacts were larger and more significant in the case of longer-term loans. This supports the hypothesis that longer loan terms, with lighter repayment burdens, could increase household welfare.

C. Issue

79. **Baseline data.** Lack of baseline data has been a key impediment to the conduct of impact evaluations. In this IES, the project required loan applications to include essential household data. Contrary to the initial investigation, during the implementation of the IES, PCIs could not provide all approved application records and they certainly did not keep failed applications. Baseline data, even where collected, did not necessarily include such data for an appropriate control group. Data storage was also not ideal. Similar issues are evident in other ADB projects examined prior to the study. Since December 2010, ADB has begun to actively promote impact evaluation through the establishment of an impact evaluation committee comprising heads of departments and a staff working group led by the Economics and Research Department. However, the resources available in terms of funding and staff skills for impact evaluations are still limited.

D. Recommendations

80. The following recommendations are provided for consideration by management:

Recommendation	Responsibility	Timing
1. Improve the analysis and design of LIH projects for better targeting and greater welfare impacts. LIH loans were supposed to help poor households improve their living conditions and subsequently their welfare. However, the borrowers did not turn out to be the relatively poorer segment of the eligible group. Careful poverty analysis, proper selection criteria, and more flexible loan procedures would enhance the inclusiveness and beneficial impact of the project. Likewise, flexibility in the loan size, loan term, and loan use enhance the type and magnitude of the impacts.	Regional departments	From January 2012
2. Increase gradually the collection and maintenance of baseline data on selected projects amenable for impact evaluation. Having credible baseline data is critical for impact evaluations to demonstrate project development effectiveness. For this, proper baseline surveys of carefully specified project and non-project groups of sufficient size and geographic coverage are essential. Such surveys should use well-designed and tested questionnaires to elicit the information required for evaluations. Survey questionnaires and sampling strategy need to take into account the context of project design to ensure every element of the project is appropriately covered. Sufficient resources, both funding and staff skills, need to be provided.	Regional departments, Economics and Research Department, Impact Evaluation Committee	From January 2012

LIST OF HOUSING FINANCE OPERATIONS

Table A1.1: Loans and Components

(Approved on 1966–2011, as of 15 May 2011)

Loan No.	DMC	Title	Sector	Fund	Amount ($ million)	Approval Date	Completion Date	Closing Date	Performance Rating	
									PCR	PPER/ VR
297	HKG	Sha Tin Urban Development (Housing)	SUH	OCR	20.5	14-Apr-77	Feb-82	31-Dec-81	NR	NR
344	MAL	Trengganu Tengah Township Development	USD	OCR	16.0	29-Jun-78	Aug-84	6-Jun-83	NR	NR
400	INO	Bandung Urban Development	USD	OCR	32.3	29-May-79	Dec-87	26-Feb-88	NR	GS
424	KOR	Low Cost Urban Housing	SUH	OCR	30.0	23-Nov-79	Apr-82	8-Jun-82	GS	GS
481	THA	Bang Plee New Town	USD	ADF	20.0	18-Nov-80	Dec-88	13-Feb-89	NR	PS
538	KOR	Second Low-Income Urban Housing	SUH	OCR	60.0	12-Nov-81	May-83	30-Jun-83	NR	NR
550	INO	Medan Urban Development	USD	OCR	39.3	26-Nov-81	Jun-89	11-Oct-89	NR	GS
629	INO	Small Towns Urban Development Sector	USD	OCR	36.7	09-Jun-83	Jun-90	18- Dec-90	NR	GS
736	THA	Shelter Sector	SUH	OCR	38.0	23-Apr-85	Sep-90	18-Jul-90	NR	GS
1004	PAK	Second Urban Development	USD	ADF	66.0	19-Dec-89	Aug-00	26-Nov-02	S	
1005	FIJ	Low Income Housing Development	HF	OCR	9.6	21-Dec-89	Mar 96	14-Mar-96	PS	US
1096	SRI	Low-Income Housing	HF	ADF	20.0	29-Aug-91	Dec-97	13-Feb-98	GS	
1204	SRI	Urban Development Sector	USD	ADF	27.0	08-Dec-92	Aug-99	09-Nov-99	S	
1415	IND	Karnataka Urban Infrastructure Development	USD	OCR	85.0	14-Dec-95	Jun-04	07-Dec-04	S	S
1416	IND	Karnataka Urban Infrastructure Development	USD	OCR	20.0	14-Dec-95		26-Jan-01	HS	
1549	IND	Housing Finance (National Housing Bank)	HF	OCR	100.0	25-Sep-97		23-Dec-99	S	
1550	IND	Housing Finance (Housing and Urban Development Corporation)	HF	OCR	100.0	25-Sep-97		06-Dec-99	S	
1551	IND	Housing Finance (Housing Development Finance Corporation)	HF	OCR	100.0	25-Sep-97		26-Jan-01	S	
1632	SRI	Urban Development and Low Income Housing	USD	ADF	70.0	24-Sep-98	Jan-05	26-Dec-07	PS	
1719	IND	Urban and Environmental Infrastructure Facility (HUDCO)	USD	OCR	90.0	17-Dec-99		02-Jul-01		
1758	IND	Housing Finance II - Housing and Urban Development Corporation	HF	OCR	0	21-Sep-00		07-Sep-01		
1759	IND	Housing Finance II - National Housing Bank	HF	OCR	40.0	21-Sep-00		30-Jun-07	US	PS
1760	IND	Housing Finance II - Housing Development Finance Corporation	HF	OCR	0	21-Sep-00		08-Oct-01		
1761	IND	Housing Finance II - ICICI	HF	OCR	80.0	21-Sep-00		10-Oct-07	S	PS
1847	MON	Housing Finance (Sector)	HF	ADF	15.0	18-Oct-01	Dec-07	24-Aug-08	S	S
1907	MON	Integrated Development of Basic Urban Services in Provincial Towns	USD	ADF	20.1	06-Aug-02		18-Nov-09		
1990	VIE	Housing Finance	HF	ADF	30.0	20-Dec-02		31-Aug-11		
2063	PHI	Development of Poor Urban	USD	OCR	30.5	18-Dec-03		10-Jun-10		

Loan No.	DMC	Title	Sector	Fund	Amount ($ million)	Approval Date	Completion Date	Closing Date	Performance Rating	
									PCR	PPER/ VR
		Communities Sector								
2072	INO	Neighborhood Upgrading and Shelter Sector	SUH	OCR	68.6	19-Dec-03		31-Dec-10		
2073	INO	Neighborhood Upgrading and Shelter Sector	SUH	ADF	20.0	19-Dec-03		31-Dec-10		

ADF = Asian Development Fund, DMC = developing member country, FIJ = Fiji, GS = generally successful, HF = housing finance, HKG = Hong Kong; IND = India, INO = Indonesia, KOR = Korea, MAL = Malaysia, MON = Mongolia, NR = not rated, OCR = ordinary capital resources, PAK = Pakistan, PCR = project completion report, PHI = Philippines, PPER = project performance evaluation report, PS = partly successful, S = successful, SRI = Sri Lanka, SUH = slum upgrading and housing, THA = Thailand, US = unsuccessful, USD = urban sector development, VIE = Viet Nam, VR = PCR validation report.

Source: Asian Development Bank loan database.

Table A1.2: Grants

(Approved 1966–2011, as of 15 May 2011)

Grant No.	DMC	Grant Project Name	Sector	Fund Source	Amount ($)	Other Source	Project Type	Date			Grant Status
								Approval	Completion	Closing	
9003	PHI	On-Site Urban Upgrading for Vulnerable Slum Communities of Payatas	USD	JFPR	1,000,000	-	Project	13-Dec-00	29-Feb-04	30-Jun-07	Closed
9004	PHI	Off-Site and Off-City Relocation of Vulnerable Slum Communities of Muntinlupa City	USD	JFPR	1,000,000	-	Project	21-Dec-00	31-Dec-04	30-Jun-07	Closed
9013	AZE	Integration of Internally Displaced Persons in Mingechevir Rayon	SUH	JFPR	2,500,000	-	Project	30-Jan-02	31-Dec-04	16-May-07	Closed
9015	MON	Improving the Living Environment of the Poor in Ger Areas of Mongolia's Cities	SUH	JFPR	2,200,000	-	Project	07-May-02	31-Aug-07	23-Feb-08	Closed
9021	IND	Rainwater Harvesting and Slum Development in Rajasthan	USD	JFPR	1,900,000	-	Project	24-Sep-02	31-Jan-08	31-Mar-09	Closed
9024	AFG	Road Employment Project for Settlement and Integration of Returning Refugees and Displaced	SUH	JFPR	15,000,000	-	Project	03-Oct-02	31-Dec-08	16-Nov-09	Closed
9024	AFG	Road Employment Project for Settlement and Integration of Returning Refugees and Displaced	SUH	Others	15,000,000	KUW	Project	26-May-03	31-Dec-08	16-Nov-09	Closed
9074	INO	Seismically Upgraded Housing in Nanggroe Aceh Darussalam and North Sumatera	SUH	JFPR	2,000,000	-	Project	06-Sep-05	14-Jul-09		Active
9106	MON	Community-Driven Development for Urban Poor in Ger Areas	SUH	JFPR	1,500,000	-	Project	02-Mar-07	30-Jun-11		Active

AFG = Afghanistan, AZE = Azerbaijan, DMC = developing member country, IND = India, INO = Indonesia, JFPR = Japan Fund for Poverty Reduction, KUW = Kuwait, MON = Mongolia, PHI = Philippines, SUH = slum upgrading and housing, USD = urban sector development.

Source: Asian Development Bank loan database.

Table A1.3: Technical Assistance

(Approved 1966–2011, as of 15 May 2011)

TA No.	DMC	TA Name	Sector	Fund Source	Amount ($)	Other Source	TA Type	Date			TA Status
								Approval	Completion	Closing	
444	MAL	Public Low Cost Housing	SUH	TASF	500,000	UNDP	PP	23-Dec-81		2-Nov-84	Cancelled
675	THA	Shelter Sector	SUH	Others	576,000	SWI	AD	23-Apr-85		31-Jul-90	Closed
942	PAK	House Building Finance Corporation	HF	TASF	318,000		AD	08-Jan-88		31-Mar-90	Closed
976	FIJ	Fiji Housing Authority	SUH	TASF	96,000		AD	09-May-88		31-Mar-89	Closed
979	BHU	Low-Income Housing Finance	HF	TASF	96,000		PP	05-May-88		31-Oct-89	Closed
981	PAK	Low-Income Housing	HF	TASF	100,000		PP	07-Jun-88		31-Dec-90	Closed
1100	SRI	Housing Development Finance Corporation	HF	TASF	295,000		AD	05-Jan-89		31-Mar-91	Closed
1103	BAN	Institutional Strengthening of the Housing and Settlement Directorate	SUH	JSF	440,000		AD	12-Jan-89		31-Dec-92	Closed
1252	FIJ	Housing Authority Manpower Training	HF	TASF	202,000		AD	21-Dec-89		31-Aug-99	Closed
1253	FIJ	Strengthening the Department of Town Country Planning (DTCP)	HF	TASF	340,000		AD	21-Dec-89		31-Mar-95	Closed
1254	FIJ	Housing Sector Resource Mobilization Study	HF	TASF	199,000		AD	21-Dec-89		31-Mar-94	Closed
1293	SRI	Low-Income Housing Development	HF	TASF	108,000		PP	26-Apr-90		31-Mar-91	Closed
1332	SAM	Housing Sector Study	HF	TASF	350,000		AD	06-Jul-90		31-Dec-93	Closed
1555	SRI	Institutional Support to HDFC and SMIB	HF	TASF	630,000		AD	29-Aug-91		30 Jun 98	Closed
1556	SRI	Housing Sector Development	HF	TASF	680,000		AD	29-Aug-91		31-Mar-95	Closed
1670	BAN	Housing Sector Institutional Strengthening	HF	TASF	600,000		AD	04-Feb-92	9-Nov-93	31-Dec-93	Closed**
2245	FIJ	Restructuring of the Housing Authority	SUH	JSF	450,000		AD	19-Dec-94		30-Nov-99	Closed**
2586	INO	Secondary Mortgage Facility (SMF)	HF	TASF	96,000		AD	13-Jun-96		30-Apr-00	Closed
2700	IND	Housing Finance Facility	HF	TASF	100,000		PP	05-Dec-96		30-Apr-98	Closed
2708	SAM	Assistance to Housing Sector	SUH	TASF	100,000		AD	12-Dec-96		31-May-98	Closed
2833	IND	Strengthening Housing Finance Institutions	HF	JSF	600,000		AD	24-Jul-97		30-Sep-00	Closed**
2890	MON	Housing Sector Policy	SUH	JSF	150,000		AD	08-Oct-97		31-May-99	Closed**
2890	MON	Housing Sector Policy (Supplementary)	SUH	JSF	60,000		AD	26-Mar-98		31-May-99	Closed**
3019	PRC	Policies and Regulatory Framework for the Construction	SUH	TASF	570,000		AD	20-May-98	30-Jun-01	31-Dec-02	Closed***

TA No.	DMC	TA Name	Sector	Fund Source	Amount ($)	Other Source	TA Type	Date			TA Status
								Approval	Completion	Closing	
		Industry									
3067	IND	Restructuring State-Level Housing Institutions	HF	TASF	500,000		AD	11-Sep-98		31-Dec-01	Closed
3090	MON	Institutional Strengthening of the Housing Sector	SUH		800,000		AD	19-Oct-98	30-Sep-01	31-Jul-03	Closed*
3288	IND	Housing Finance II	HF	TASF	405,000		PP	08-Nov-99		30-Sep-03	Closed
3406	MON	Housing Sector Finance	HF	JSF	600,000		PP	02-Mar-00		31-May-03	Closed
3487	VIE	Low Income Housing and Secondary Towns Urban Development Needs Assessment Study	SUH	JSF	500,000		AD	30-Aug-00	31-Oct-01	30-Apr-03	Closed**
3732	IND	Assessing the Role of Mortgaged-Backed Securities	HF	TASF	150,000		AD	02-Oct-01		31-Jul-03	Closed
3853	VIE	Housing Finance	HF	TASF	400,000		PP	05-Apr-02		27-Mar-04	Closed
3895	INO	Shelter Sector Project	SUH	TASF	1,000,000		PP	11-Jul-02		29-Oct-04	Closed
4042	BHU	Housing Sector Reform	SUH	TASF	500,000		AD	18-Dec-02	2-Aug-04	13-Oct-04	Closed**
4293	PHI	Capacity Building for Housing Microfinance	HF	TASF	1,500,000		AD	18-Dec-03		Aug-10	Active
4293	PHI	Capacity Building for Housing Microfinance (Supplementary)	HF		500,000	EAKPF	AD	27-Jun-08		Aug-10	Active
4366	INO	Institutionalization of Participatory Approaches to Shelter Provision	SUH		50,000	UKG	PP	02-Aug-04		29-Aug-05	Closed
4368	INO	Financing Integrated Settlements Development	HF		800,000	UKG	PP	03-Aug-04		21-Apr-08	Closed
4569	IND	A Study on the Development of an Agency to Facilitate Issuance of Residential Mortgage-Back	HF		250,000	SWI	AD	25-Feb-05		13-Mar-09	Closed
4715	INO	Secondary Mortgage Facility	HF	JSF	600,000		AD	06-Dec-05		12-Mar-09	Closed
7469	REG	Housing Finance Capacity Development in South and Southeast Asia	HF	TASF	1,300,000		CD	22-Dec-09		Dec-12	Active

AD = advisory, BAN = Bangladesh, BHU = Bhutan, CD = capacity development, DMC = developing member country, EAKPF = e-Asia and Knowledge Partnership Fund, FIJ = Fiji Islands, HF = housing finance, IND = India, INO = Indonesia, JFPR = Japan Fund for Poverty Reduction, JSF = Japan Special Fund, MAL = Malaysia, MON = Mongolia, PAK = Pakistan, PHI = Philippines, PP = project preparatory, PRC = People's Republic of China, REG = regional, SAM = Samoa, SRI = Sri Lanka, SUH = slum upgrading and housing, SWI = Switzerland, TA = technical assistance, TASF = Technical Assistance Special Fund, THA = Thailand, UKG = United Kingdom, UNDP = United Nations Development Programme, VIE = Viet Nam.
Note: For TA completion report rated: * = highly successful; ** = generally successful/successful; *** = partly successful.
Source: Asian Development Bank grant and technical assistance database.

Table A1.4: Summary Table of Technical Assistance Approvals for Housing
(up to 15 May 2011)

	TA Approvals			All TA Projects	
Year of Approval	Number	Amount ($ million)	All TA Projects (%)	Number	Amount ($ million)
1966–1969	…	…	…	24	3.54
1970–1979	…	…	…	307	58.75
1980–1989	11	3.16	1.09	940	289.48
1990–1999	16	6.20	0.59	2,186	1,053.42
2000–2011	14	8.30	0.52	2,318	1,597.85
Total	**41**	**17.66**	**0.59**	**5,775**	**3,003.05**

… = not available, TA = technical assistance.
Source: Asian Development Bank (ADB) Independent Evaluation Department calculations based on ADB database.

Table A1.5: Nonsovereign Operations
(up to 15 May 2011)

	NSO Approvals			All NSOs	
Year of Approval	Number	Amount ($ million)	All NSOs (%)	Number	Amount ($ million)
1966–1969	…	…	…	…	-
1970–1979	…	…	…	…	-
1980–1989	…	…	…	50	297.32
1990–1999	1[a]	…	…	105	1,316.05
2000–2011	9	394.94	5.09	164	7,764.87
Total	**10**	**394.94**	**4.21**	**319**	**9,378.24**

… = not available, NSOs = nonsovereign operations.
[a] Includes cancelled Investment Operation 7148-INO.
Source: Asian Development Bank (ADB) Independent Evaluation Department calculations based on ADB project database.

HOUSING FINANCE LOAN DISBURSEMENTS

Table A2.1: Disbursement by Participating Credit Institutions

Participating Credit Institution	Number of Loans	Loan Amount (SLRs million)	Interest Rate Applied (%)
Commercial Bank of Ceylon	296	36.2	10.50–16.00
Hatton National Bank	399	29.8	12.00–16.00
Kandurata Development Bank	5,170	324.1	11.50–16.00
Rajarata Development Bank	1,394	71.5	12.89–16.00
Ruhunu Development Bank	5,491	275.6	10.00–15.17
National Development Bank–Housing Bank	101	18.7	14.50–16.00
Housing Development Finance Corporation	15,527	1,652.3	10.50–15.90
Total	**28,378**	**2,408.2**	

SLRs = Sri Lanka rupees.
Source: ADB. 2006. *Completion Report: Urban Development and Low-Income Housing (Sector) Project in Sri Lanka.* Manila.

Table A2.2: Disbursement by Province

Province	Number of Loans	Percent	Loan Amount (SLRs million)	Percent
Western	5,097	18.0	604.6	25.1
Southern	8,109	28.6	561.2	23.3
Central	7,051	24.9	500.0	20.8
Sabaragamuwa	2,154	7.6	216.8	9.0
North Western	1,658	5.8	182.5	7.5
North Central	2,506	8.8	179.5	7.5
Uva	1,420	5.0	125.3	5.2
North and East	383	1.3	38.3	1.6
Total	**28,378**	**100.0**	**2,408.2**	**100.0**

SLRs = Sri Lanka rupees.
Source: ADB. 2006. *Completion Report: Urban Development and Low-Income Housing (Sector) Project in Sri Lanka.* Manila.

Table A2.3: Disbursement by Income Group

Income Group (SLRs per month)	Number of Loans	Percent	Amount (SLRs million)	Percent
Less than 2,500	362	1.3	12.6	0.5
2,501–5,000	4,198	14.8	219.6	9.1
5,001–7,500	9,630	33.9	719.6	29.9
7,501–10,000	8,948	31.5	825.8	34.3
10,001–12,500	5,240	18.5	630.6	26.2
Total	**28,378**	**100.0**	**2,408.2**	**100.0**

SLRs = Sri Lanka rupees.
Source: ADB. 2006. *Completion Report: Urban Development and Low-Income Housing (Sector) Project in Sri Lanka.* Manila.

Table A2.4: Disbursement by Purpose

Purpose	Number of Loans	Percent
Construction of new house and extensions	19,751	69.6
Renovation of existing houses	6,130	21.6
Purchase of land for new house construction	2,128	7.5
Service connections	312	1.1
Purchase of house	57	0.2
Total	**28,378**	**100.0**

SLRs = Sri Lanka rupees.
Source: ADB. 2006. *Completion Report: Urban Development and Low-Income Housing (Sector) Project in Sri Lanka.* Manila.

NARRATIVE CAUSAL CHAIN ANALYSIS

1. This section refers to Figure 1 in the main text. It describes causal chains running from housing loans to the aforementioned impact indicators. The first links in the causal chains are the loans' impacts on physical attributes of housing and the financial status of the households. Program loans were used to improve housing, but they simultaneously imposed a burden on the households.

2. **Housing quality index.** The housing quality index (HQI) is a weighted average of indicators for the presence of housing quality attributes: electricity connection, potable water connection, sanitary toilet, sanitary garbage disposal, permanent floor, permanent walls, permanent roof, and crowding not more than two persons into a bedroom. Household improvements could focus on any subset of these. Housing loans were used to finance improvements in HQI.

3. **Current rental value and current asset value**. These measures are positively correlated with improvements in HQI. Higher asset values contribute to the households' sense of security, they may provide collateral for subsequent loans, and they may generate an income effect that affects household expenditures.

4. **Labor force participation rates**. Housing-related loans impose repayment burdens on the recipient households. Households may respond to this by increasing their labor force participation rates. To the degree that able-bodied men are already employed, the household increase in labor force participation may be concentrated among women, particularly if the house improvement provides a venue for women-operated household businesses. An additional possibility is that members of the household become migrant workers—or extend their stays as migrant workers—for purposes of remitting funds; this possibility was mentioned by a key informant during the KIIs conducted for this study. Finally, to the extent that a better HQI releases women from time-consuming and burdensome tasks like fetching water and disposing garbage, it may also contribute to greater labor force participation among women.

5. **Per capita monthly household expenditure and per capita monthly household income.** Both measures are directly affected by the current rental value, as the current rental value of owner-occupied housing is a component of expenditure and income. Expenditure is also directly affected by periodic loan payments. In addition, loans' impacts on household finances may have indirect effects on both measures. If household members increase their labor force participation rates, their weekly work hours, or their remittances, these would all be reflected in higher per capita monthly household income. In some cases, the higher income may be sufficient to increase monthly expenditures beyond the amount required for loan payments.

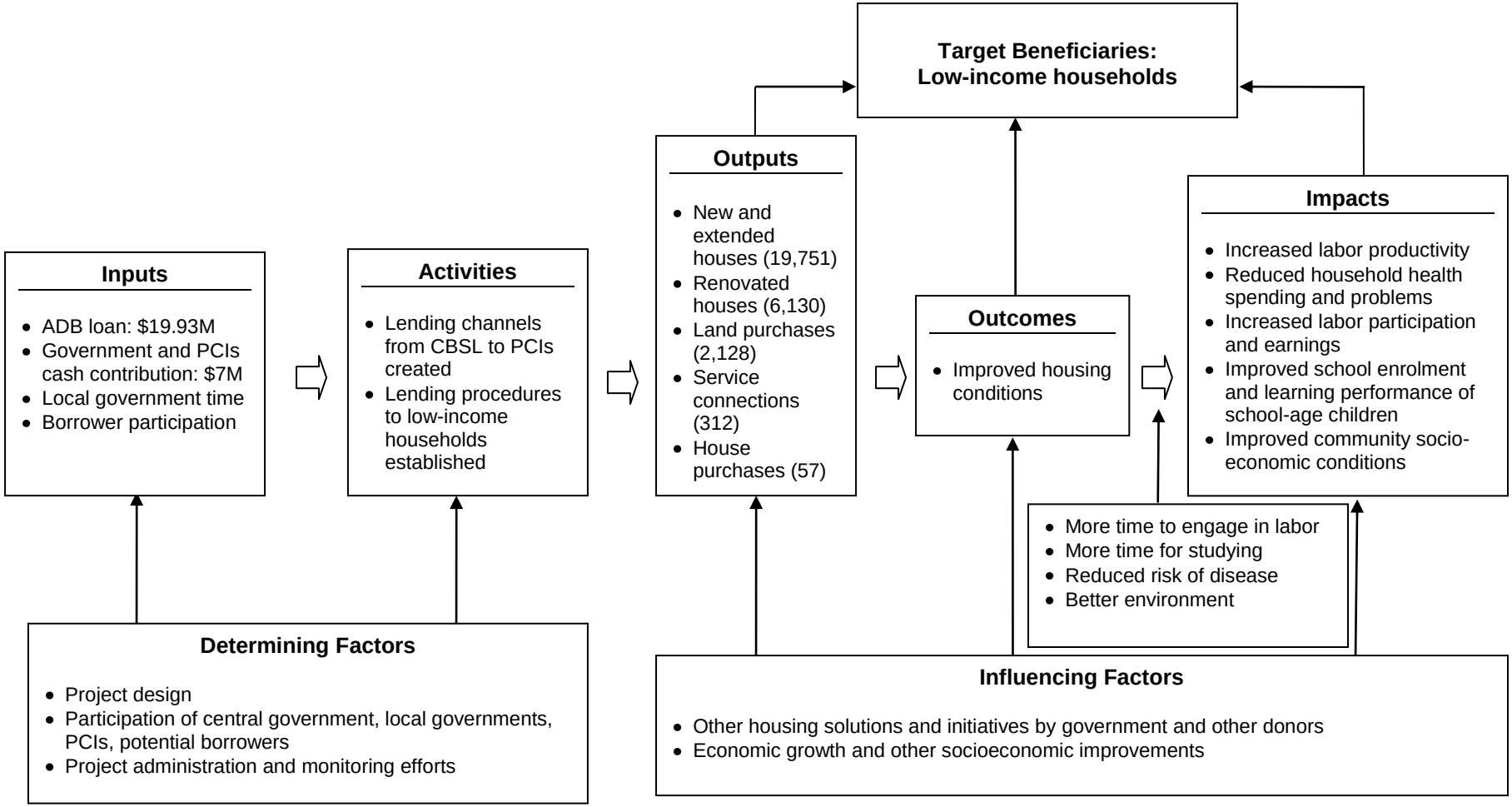
6. **Household completeness**. The impact of housing loans on household completeness is ambiguous. On the one hand, less crowding may make it more comfortable for couples to share a house, on the other hand, household supply of migrant labor reduces the probability of household completeness.

7. **Measures of health**. A better HQI can lead directly to better health through reduction in exposure to the elements and to vectors of disease transmission. In this context, we think mainly of the benefits of piped-in potable water, sanitary toilets, sanitary garbage disposal, cement floors, and electricity (for refrigerated food storage). The relationship between income and health is reciprocal: increased income also contributes to better health, because higher-

income households can afford medical care and medicines, and better health increases income by lowering absenteeism from the workplace.

8. **Schooling**. Better housing can lead to better school attendance, especially for girls. If households are constrained in the number of children they can send to school, they usually choose to send the boys first. If higher income relaxes that constraint, then more girls can go to school. If higher-quality housing releases girls from duties related to maintaining lower-quality houses, then they may more readily attend school. On the other hand, if loan repayment requirements induce greater female (adult) labor force participation, girls may be given additional household chores that interfere with their schooling. Once in school, children may benefit from living in higher-HQI houses. In houses that have electricity, less crowding, and fewer household-related burdens, studying becomes more feasible and study hours should increase. Finally, if frequency and duration of illnesses among children are reduced, absenteeism should decline and study hours should increase. The benefit of better housing for children's education and general well-being was a frequent theme in the FGDs, the KIIs, and the case studies.

EVALUATION LOGIC MODEL



ADB = Asian Development Bank, CBSL = Central Bank of Sri Lanka, M = million, PCIs = participating credit institutions.
Source: ADB Independent Evaluation Department, construction based on project documents.

LOAN RECORDS SUBMITTED BY PARTICIPATING BANKS

Table A5.1: Loan Records by Participating Credit Institutions in Five Study Provinces

Province	HDFC	RDB	HNB	CBC	Total
Southern	2,432	7,307	25	54	9,818
Central	1,832	1,682	39	46	3,599
Western	4,870	0	176	67	5,113
North Central	988	693	15	18	1,714
Sabaragamuwa	1,979	0	39	40	2,058
Total	**12,101**	**9,682**	**294**	**225**	**22,302**

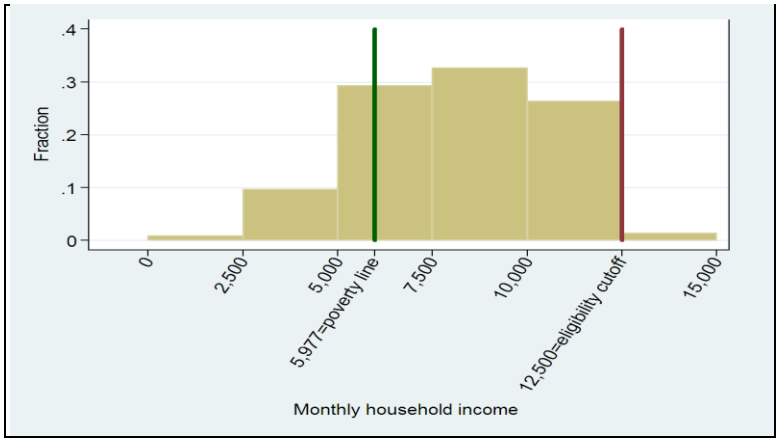
CBC = Commercial Bank of Ceylon, HDFC = Housing Development Finance Corporation, HNB = Hatton National Bank, RDB = Regional Development Bank.
Source: Asian Development Bank Independent Evaluation Department calculations based on data provided by participating credit institutions.

Table A5.2: Distribution of Borrowers by Monthly Household Income

Income Group (SLRs per month)	Number of Loans	Percent
Less than 2,500	145	0.9
2,501–5,000	1,727	11.1
5,001–7,500	4,453	28.5
7,501–10,000	5,241	33.5
10,001–12,5000	4,000	25.6
Above 12,500	63	0.4
Total	**15,629**	**100.0**

SLRs = Sri Lanka rupees.
Source: Asian Development Bank Independent Evaluation Department calculations based on data provided by participating credit institutions.

Figure A5.1: Distribution of Borrowers by Monthly Household Income (SLRs)



SLRs = Sri Lanka rupees.
Note: The poverty line is for 2002. It was computed using the national poverty line of SLRs1,423 per capita defined by the Department of Statistics and Census, and the average family size of 4.2 taken from Sri Lanka's Household Expenditure and Income Survey 2002.
Sources: Sri Lanka's Department of Census and Statistics. Income distribution was constructed by the impact evaluation study based on loan records submitted by participating credit institutions.

DATA SOURCES

1. The study conducted four data-generation activities: (i) a survey of households that had borrowed project housing loans and of an equal number of comparison households (from communities similar to the project communities) that had not; (ii) a survey of communities in *grama niladhari* (GN) divisions where the interviewed households reside;[1] (iii) key informant interviews (KIIs) with officials from the Central Bank of Sri Lanka (CBSL), participating credit institutions (PCIs), and relevant government agencies, and with key informants in villages; and (iv) focus group discussions (FGDs) involving borrowing and non-borrowing households.

2. The household survey asked 15 types of questions about: (i) location, (ii) demographics, (iii) education and literacy, (iv) health, (v) economic activity, (vi) housing condition, (vii) household assets, (viii) household expenditures, (ix) household income, (x) credit, (xi) savings, (xii) insurance, (xiii) risk coping, (xiv) welfare indicators, and (xv) project-related issues. These are designed to cover the information requirement identified in the evaluation logic model (Appendix 4).

3. The community survey asked six types of questions about: (i) physical characteristics, (ii) demographics and resources, (iii) housing, (iv) proximity to basic services and service institutions, (v) natural disasters, and (vi) changes in living conditions and community activities. Due to a wide dispersion of beneficiary households, not all their communities were covered by a community survey.

4. The KIIs were designed to investigate two groups of issues—general economic and housing-related issues, and project-related issues. The FGDs were designed to investigate how important housing development issues are and the challenges faced by people in meeting their housing needs.

Details of the Sampling Scheme

5. The evaluation requires the selection of treatment and comparison households. The treatment households were selected from those for which the PCIs were able to retrieve loan records. The comparison households were selected by GNs, because data that might have been contained in local records were not available. The detailed procedures are described below.

6. **Determination of sample size**. Sample size and power calculations were done using the urban population subset of the 25% sample from Sri Lanka's 2006–2007 Household Income and Expenditure Survey, the latest available household survey data, that Sri Lanka's Department of Statistics and Census provided to the evaluation team. From this data set only four major outcome variables are available: per capita household income, employment, school attendance, and hospital visits. Assuming desired statistical significance of 0.05, power of 0.80 and an effect size of 15%, sample sizes for one-sided and two-sided mean tests for the four variables were estimated. The largest samples required are 1,695 for a two-sided mean test for hospital visits and 1,336 for a one-sided test. The smallest samples required are 122 for a two-sided test and 96 for a one-sided test of school attendance. The required sample sizes for other variables are in between (Table A6.1).

[1] The administrative structure of Sri Lanka is as follows: national, province, district, divisional secretariat (DS), and *grama niladhari* (GN) division—the officials of the latter being *grama niladharis* (GNs). The GN division is the lowest formal administrative unit.

Table A6.1: Sample Size of Key Variables (α=0.05, 1-β=0.8)

Variable	Mean	Change (%)	Standard Deviation	Sample Size: One-sided	Sample Size: Two-sided
Log per capita household income	8.9534	15	1.2632	1,011	1,283
Employment, female	0.7451	15	0.4358	189	239
School attendance, both genders	0.8517	15	0.3554	96	122
Hospital visit, both genders	0.2916	(15)	0.4545	1,336	1,695

Source of basic data: 25% of Sri Lanka Household Income and Expenditure Survey, 2006–2007.

7. **Selection of treatment households**. The project records of CBSL indicate that two of the nine project provinces (the Northern and Eastern provinces) had only a few project borrowers because of the civil conflict with the Tamil Tiger separatists in those provinces.[2] Similarly, the North Western and Uva provinces had relatively few borrowers (Table A6.2). It was determined to draw the sample from districts within the five provinces with the most loans.

Table A6.2: Number and Amount of Loan by Province

Province	Number of Loans	Percent	Loan Amount (SLRs million)	Percent
Southern	8,109	28.6	561.2	23.3
Central	7,051	24.9	500.0	20.8
Western	5,097	18.0	604.6	25.1
North Central	2,506	8.8	179.5	7.5
Sabaragamuwa	2,154	7.6	216.8	9.0
North Western	1,658	5.8	182.5	7.5
Uva	1,420	5.0	125.3	5.2
Northern and Eastern	383	1.3	38.3	1.6
Total	**28,378**	**100.0**	**2,408.2**	**100.0**

Source: Central Bank of Sri Lanka.

8. The PCIs were unable to retrieve loan records for all project loans. Table A6.3 shows the number of project loans made by each PCI and the number of loan records they submitted.

Table A6.3: Number of Loans by Participating Credit Institutions

Participating Credit Institution	Number of Loans	Percent ofTotal	Number of Loan Records Submitted	Percent Submitted
Housing Development Finance Corporation	15,527	54.7	12,101	78
Regional Development Bank	12,055	42.5	9,682	80
Hatton National Bank	399	1.4	294	74
National Development Bank–Housing Bank	101	0.4	0	0
Commercial Bank of Ceylon	296	1.0	225	76
Total	**28,378**	**100.0**	**22,302**	**79**

Sources: Central Bank of Sri Lanka and participating credit institutions.

[2] ADB. 2006. *Completion Report: Urban Development and Low-Income Housing (Sector) Project in Sri Lanka.* Manila.

9. The loan records submitted by the PCIs for the five study provinces consist of 22,302 loan accounts, distributed as shown in Table A6.4. The records contain the province, district, and postal address of each borrower. The divisional secretariat (DS) and the GN division of each borrower was determined by examining manually the postal address and consulting the Department of Statistics and Census records as well as the corresponding PCI.

Table A6.4: Loan Records Submitted in Five Study Provinces

Province	HDFC	RDB	HNB	CBC	Total
Southern	2,432	7,307	25	54	9,818
Central	1,832	1,682	39	46	3,599
Western	4,870	0	176	67	5,113
North Central	988	693	15	18	1,714
Sabaragamuwa	1,979	0	39	40	2,058

CBC = Commercial Bank of Ceylon, HDFC = Housing Development Finance Corporation, HNB = Hatton National Bank, RDB = Regional Development Bank.
Source: Asian Development Bank Independent Evaluation Department calculations based on data provided by participating credit institutions.

10. Table A6.5 shows the distribution of loan records across districts and provinces; loans are highly concentrated in certain districts within provinces. Since the geographical area per province is large (ranging from about 3,700 to 10,500 square kilometers) it was deemed desirable to minimize the survey transportation cost by drawing the sample from districts with the most loans. The chosen districts are in bold.

Table A6.5: Loan Records by Province and District

	Province					
District	**Central**	**North Central**	**Sabaragamuwa**	**Southern**	**Western**	**Total**
Anuradhapura	0	**1,402**	0	0	0	1,402
Colombo	0	0	0	0	**2,570**	2,570
Galle	0	0	0	2,741	0	2,741
Gampaha	0	0	0	0	1,772	1,772
Hambantota	0	0	0	**4,168**	0	4,168
Kalutara	0	0	0	0	771	771
Kandy	**2,508**	0	0	0	0	2,508
Kegalle	0	0	946	0	0	946
Matale	492	0	0	0	0	492
Matara	0	0	0	2,909	0	2,909
Mathale	240	0	0	0	0	240
Nuwara Eliya	5	0	0	0	0	5
Nuwara-Eliya	86	0	0	0	0	86
Nuwaraeliya	268	0	0	0	0	268
Polonnaruwa	0	312	0	0	0	312
Rathnapura	0	0	**1,112**	0	0	1,112
Total	**3,599**	**1,714**	**2,058**	**9,818**	**5,113**	**22,302**

Source: Asian Development Bank Independent Evaluation Department calculations based on data provided by participating credit institutions.

11. The five selected districts account for 11,760 loan accounts. The distribution of these loan accounts by the PCIs is given in Table A6.6.

Table A6.6: Loan Accounts from Selected Districts

Province	Selected District	Participating Credit Institutions				Total
		CBC	HDFC	HNB	RDB	
Southern	Hambantota	4	1,073	8	3,083	4,168
Central	Kandy	32	1,273	29	1,174	2,508
Western	Colombo	22	2,474	74	0	2,570
North Central	Anuradhapura	3	988	15	396	1,402
Sabaragamuwa	Rathnapura	9	1,103	0	0	1,112
	Total	**70**	**6,911**	**126**	**4,653**	**11,760**

CBC = Commercial Bank of Ceylon, HDFC = Housing Development Finance Corporation, HNB = Hatton National Bank, RDB = Regional Development Bank.
Source: Asian Development Bank Independent Evaluation Department calculations based on data provided by participating credit institutions.

12. After the DS and GN divisions were determined for these 11,706 loans, one to three DSs with the most loans were picked for each selected district. Finally, from each selected DS, one to five GN divisions with the most loans were selected. To ensure the representativeness of the sample at the provincial level, the number of sample households was distributed proportionally to the number of loans originally made in the study provinces. This is shown in Table A6.7, assuming target sample sizes of 1,000 treatment and control households.

Table A6.7: Distribution of Loans and Survey Sample by Province

Province	Number of Loans	Percent	Household		GN Division	
			Treatment	Comparison	Treatment	Comparison
Southern	8,109	32.5	325	325	5	5
Central	7,051	28.3	283	283	4	4
Western	5,097	20.5	205	205	3	3
North Central	2,506	10.1	101	101	2	2
Sabaragamuwa	2,154	8.6	86	86	1	1
Total	**24,917**	**100.0**	**1,000**	**1,000**	**15**	**15**

GN = *grama niladhari.*
Source: Asian Development Bank Independent Evaluation Department calculations based on data provided by participating credit institutions.

13. Representativeness was extended to the GN level by choosing the sample size from each GN division to be proportional to the number of loans originally made in that GN division relative to the total number of loans made in all the study GN divisions. To allow for missing households due to any reason that a selected household is not present, a list of 10% potential replacement households was prepared for each GN division.

14. In the field it turned out to be impossible to stick to the original design because of difficulties in locating the requisite number of households in each GN division, though every effort was made to do so. Nonetheless, the original design was observed at the district level. Table A6.8 shows the distribution of treatment sample elements across districts and PCIs; the distribution of control sample elements is identical.

15. **Selection of control grama niladhari divisions and control households**. The treatment households were distributed over 15 GN divisions. The first step in selecting control households was to select 15 corresponding control GN divisions. A decision was taken to

identify the control divisions as those “similar to” the treatment divisions, but within which there were no (or only very few) project borrowers. Determination of which divisions were “similar to” the treatment divisions was made by the GNs. In selecting comparison GN divisions, the GNs were requested to identify the GN divisions with no borrowers that were similar in characteristics to the treatment GN divisions. If there was an insufficient number of GN divisions with no borrowers, then those with the least number of borrowers would be selected as substitutes. The comparison characteristics included (i) population size, (ii) poverty incidence, (iii) geographic characteristics, (iv) total land area, and (v) main source of livelihood. This information was expected to be available at the DSs.

16. For each control division the same number of control households was selected as the number of treatment households in the corresponding treatment division. This was done by asking the GNs to indicate a similar household for each treatment household based on five characteristics in 1998: (i) household income, (ii) household size, (iii) age of household head, (iv) education of household head, and (v) occupation of household head. While household income would not be used as a matching variable, including it as a selection criterion ensured that comparison households would have been eligible to borrow under the project.

17. Selecting control divisions that had no borrowers was motivated by the intention to make community-level comparisons of GN divisions that did and did not participate in the housing finance component. However, this raises the question whether differences in conditions across divisions could affect the comparison of treatment and control households. In particular, if the presence or absence of borrowers across divisions is correlated with the other project components, this cross-division variation will have to be controlled for with appropriate control variables.

18. The household survey gathered data from 1,011 treatment households and an equal number of comparison households. The actual distribution of survey respondents is in Table A6.8.

Table A6.8: Number of Borrowers Surveyed

	Participating Credit Institutions				
District	**HDFC**	**RDB**	**HNB**	**CBC**	**Total by District**
Hambantota	102	227	0	0	**329**
Kandy	146	134	0	6	**286**
Colombo	185	0	22	0	**207**
Anuradhapura	73	29	0	0	**102**
Ratnapura	87	0	0	0	**87**
Total by PCIs	**593**	**390**	**22**	**6**	**1,011**

CBC = Commercial Bank of Ceylon, HDFC = Housing Development Finance Corporation, HNB = Hatton National Bank, RDB = Regional Development Bank.
Source: Asian Development Bank Independent Evaluation Department Calculations based on data provided by participating credit institutions.

THREE CASE STUDIES

A. Case 1. Ms. D. S. K. Gunawardena, Borrower from the Regional Development Bank's Gampola Branch, Kandy District, Central Province

1. Ms. D. S. K. Gunawardena lives at No. 18, “Rathnagiri”, Keerapane, in the Gampola West Grama Niladhari Division.[1] She was born on 6 October 1949. She was employed as a clerk at the Village Co-operative Society and is now retired. Her husband was a *grama niladhari* and he too has retired.

2. Earlier, she had lived with her family (including husband, two daughters and a son) in a house obtained by her under a rental scheme from the National Housing Development Authority. She wanted to build a house because the rented house they lived in was not spacious enough for the family. She also found the environment of the rented house to be unsuitable because there was less personal freedom and privacy for the family. Some people in the neighborhood were drunkards and quite often unruly and noisy. Children could not concentrate on their studies. She and her husband were also concerned about the security of their daughters. As a result, they were unhappy and suffered in this environment. She therefore decided to build a house on a land inherited from her husband’s parents.

3. Ms. Gunawardena became aware of the Asian Development Bank (ADB) housing loan project from her friends at work. She met the manager of the Gampola branch of the Kandurata Development Bank, now Regional Development Bank (RDB), in 2001. The manager requested that the loan application include a letter certifying her permanent employment, the monthly salary slip, a photocopy of the national identity card, and forms with information relating to two guarantors.

4. She was informed about the categorization of income earners required to guarantee the various loan amounts under the scheme, as a guide to help her determine the two guarantors.

> Lowest income earners = less than SLRs3,000
> Lower income earners = SLRs3,000–SLRs6,000
> Middle income earners = SLRs6,000–SLRs12,000
> Higher income earners = more than SLRs12,000

5. This was Ms. Gunawardena’s first experience in dealing with a bank. The bank manager informed her that she would be granted SLRs25,000 as a loan on her salary. If she was prepared to mortgage the land, the bank was prepared to release up to SLRs200,000. She decided to obtain SLRs25,000 initially and borrow more later. She used the loan of SLRs25,000 to lay the foundation of her house. She considered it to be the first step in fulfilling her housing dream. The term of the loan was 5 years, the monthly repayment was SLRs1,000. It was deducted from her salary and paid by check to the bank by the Village Co-operative Society. However, this system broke down because the checks issued by the society had bounced. Therefore, she had to pay installments directly to the bank, resulting in her missing the next opportunity to get a loan because the bank rejected her loan application.

6. She was, however, very happy with this loan, because it allowed her to lay the foundation for a better environment to live in. She was later able to raise a further loan of SLRs400,000 from

[1] The administrative structure of Sri Lanka is as follows: national, province, district, divisional secretariat (DS), and *grama niladhari* (GN) division—the officials of the latter being *grama niladharis* (GNs). The GN division is the lowest formal administrative unit.

RDB to continue construction of the house. A new house in a better location helped improve the status of her family. Her children were able to go through their education studying in a calmer environment. Her elder daughter is working as a clerk and is married now. Her son is a businessman and the younger daughter is still studying.

7. She is happy about the initial loan she was able to raise, even though it was relatively small. She was able to start building the house with it and she now has a modern house built over a period of time, spending SLRs800,000 all up. The house is now valued at around SLRs4 million. She has all household equipment she needs and her living conditions have vastly improved. The combined monthly income of the family is around SLRs35,000.

8. The significant lesson from this case is that the provision of a loan facility, however small it may be, has been the crucial factor for this family in initiating the housing construction activity when it was needed.

B. Case 2. Mr. P. K. D. Sumanasena, Borrower from Regional Development Bank's Angunakolapelessa Branch, Hambantota District, Southern Province

9. Mr. Sumanasena is a 54-year-old gentleman from Angunakolapelessa in Hambantota district, Southern Province. Currently he is employed as a postman. When he meets someone, he treats him or her with a big smile. Even though he smiles now, according to Mr. Sumanasena, his life was full of hardships and challenges.

10. Mr. Sumanasena got married in 1978 to Miss Kusumawathie and they have four children. He had a dream of building his own house and seeing their children grow up as good citizens in the society. Unfortunately, he did not have a permanent job; he fed his family with the income from temporary jobs. The family tried to build a house in 1983, but had to give up the idea after understanding the difficulty in finding the necessary funds for construction.

11. The first day in September 1986 was an unforgettable day for Mr. Sumanasena and his wife. He had an employment opportunity as a postman. He was very happy about getting a permanent job, as he knew how difficult it was to get a loan without a permanent income. When their children were small, his income was hardly sufficient to feed them, but they were determined to have their own house. Both of them wanted to provide sufficient space and a good environment for their children to study.

12. He opened a savings account with RDB in Angunakolapelessa. When RDB announced the housing loan scheme for low-income earners under ADB's project, he had new hopes for the future of his family. He and his wife had lengthy discussions with the bank officers about the positive and negative sides of getting a loan. As a result, in 2000, he applied for a loan of SLRs50,000 to build a new house.

13. The initial loan he obtained had a term of 3 years and repayment installments of SLRs2,200, which was a challenge for the family at first. According to Mr. Sumanasena, they had to cut down on expenses to meet the additional outlay. But because the bank had arranged to have the installments deducted from Mr. Sumanasena's salary, he never missed a payment.

14. With the SLRs50,000 from RDB, Mr. Sumanasena built the foundation of the house; but to complete it, he needed more. Therefore, after paying off the first loan, he obtained a second loan to complete the house. In addition to these two loans, he used his savings and also borrowed money (SLRs7,500) from another organization.

15. Now he has a three-bedroom, about 75 square-meter house, with electricity and piped water, a tiled roof and cement floors. He is highly satisfied with the neighbors; he says they are trustworthy and there are no violent incidents in the area.

16. His four children are grown up, the eldest daughter is married and the other three children are employed. He is very happy about the progress he achieved in his life. He said that without the initial loan of SLRs50,000 from RDB to build the foundation of the house, he would never have thought to be able to build a house.

17. Mr. Sumanasena wanted to pay his gratitude to all those who supported him by providing funds to build a house. He also appreciated the hard work done by the bank officers in introducing the loan scheme to low-income earners like him.

18. He finally said: “It is important to provide a good environment for children to grow up. Therefore, every parent wishes to have a good place to live. However, without getting a loan, the majority of low-income earners would live only with a dream of having an own house.”

C. Case 3. Mr. Dharmapala, Colombo District, Borrower from the Housing Development Finance Corporation, Colombo District, Western Province

19. Mr. Dharmapala is employed as a driver in a private sector organization. His wife was self-employed as a seamstress. After they had their two children, their one aspiration was to build a house of their own. However, they neither owned land nor had funds to buy land, let alone build a house. They lived in rented houses and annexes with hardly any room for the children to move about for almost a decade. Their rent was between SLRs500–SLRs1,500 a month for a house with just one bedroom, a living room, kitchen, and a toilet. In 2000, this was approximately 25% of Mr. Dharmapala’s salary of SLRs6,000 per month.

20. In the hope of buying land they looked at several land sale sites. Much to their dismay, most land was unaffordable for them until, in 2000, they came across some blocks of land that were being auctioned in Homagama by a finance company. Because they did not have the necessary cash of SLRs5,000 at that time to reserve a block of land, they pawned a gold bangle belonging to Mrs. Dharmapala.

21. They needed SLRs144,000 to purchase the block of land they wanted. From a friend, they heard that the Housing Development Finance Corporation (HDFC) provided loans at low interest rates for housing purposes under the ADB housing scheme. They applied for a loan and within 1 month received SLRs84,000. Since it was not enough, the balance needed was borrowed from friends and from Mr. Dharmapala’s office. The land had to be mortgaged to the bank and Mr. Dharmapala had to incur legal and insurance costs. Mr. Dharmapala gradually began building a house with a loan obtained from another bank, his earnings, and material received from Mr Dharmapala’s office.

22. Mr. Dharmapala and his wife are very grateful to HDFC for providing a low-interest loan 10 years ago, because without it, building a house would have remained a mere dream, especially since land prices in the area have increased more than five-fold. Had they not received the loan to purchase the block of land, Mrs. Dharmapala said she would have had to seek employment to raise funds to purchase land, in which case she would have had insufficient time to attend to the needs of the children.

COMPARISON OF TREATMENT AND CONTROL HOUSEHOLDS

	Treated		Control				
Variable	**Mean**	**SD**	**Mean**	**SD**	**Difference**	**t-Value**	**p-Value**
Housing Quality:							
With permanent wall	0.980	0.139	0.952	0.213	0.028	3.344	0.001
With permanent floor	0.970	0.170	0.944	0.231	0.027	2.868	0.004
With permanent roof	0.999	0.033	0.990	0.099	0.009	2.555	0.011
With potable water source	0.995	0.074	0.978	0.146	0.016	3.035	0.002
With sanitary garbage disposal	0.294	0.456	0.247	0.432	0.047	2.321	0.020
With sanitary toilet	1.000	0.000	0.983	0.129	0.017	3.951	0.000
With electricity connection	0.995	0.074	0.954	0.210	0.041	5.533	0.000
With not more than 2 persons per room	0.988	0.109	0.954	0.211	0.034	4.424	0.000
With not more than 2 persons per bedroom	0.906	0.293	0.741	0.438	0.165	9.582	0.000
With at least 15 sq m per room	0.857	0.350	0.751	0.433	0.107	5.895	0.000
HQI (not more than 2 persons per bedroom)	0.892	0.080	0.847	0.113	0.046	10.109	0.000
Housing Values							
Current value of house (SLRs)	4,428,283	4,994,258	2,870,092	5,251,128	1,558,191	6.594	0.000
Current rental value of house (SLRs)	17,238	67,461	8,224	9,582	9,014	4.191	0.000
Household Income and Expenditure:							
Per capita household expenditure, monthly (SLRs)	12,445	8,207	8,637	5,447	3,807	12.089	0.000
Per capita household income, monthly (SLRs)	14,616	12,189	9,508	7,926	5,108	10.993	0.000
Household Completeness:							
Proportion of complete households	0.887	0.317	0.854	0.354	0.033	2.167	0.030
Labor Force Participation							
Proportion working, both sexes, age 15–65 & not in school	0.615	0.274	0.575	0.282	0.040	3.150	0.002
Proportion working, male, age 15–65 & not in school	0.831	0.310	0.848	0.294	(0.017)	(1.173)	0.241
Proportion working, female, age 15–65 & not in school	0.562	0.448	0.401	0.446	0.161	7.785	0.000
Education of Children							
Proportion attending school, boys, 5–19 years old	0.902	0.291	0.864	0.324	0.038	1.753	0.080
Proportion attending school, girls, 5–19 years old	0.919	0.259	0.881	0.321	0.038	1.783	0.075
Mean hours of studying per day for those studying, boys	8.072	2.104	7.766	2.100	0.306	1.947	0.052
Mean hours of studying per day for those studying, girls	8.233	2.269	7.951	1.715	0.282	1.793	0.073
Mean number of absences, boys	0.166	0.837	0.228	1.049	(0.063)	(0.887)	0.376
Mean number of absences, girls	0.125	0.709	0.313	1.470	(0.189)	(2.138)	0.033
Health							
Per capita health expenditure, monthly (SLRs)	427.347	594.476	433.723	1257.035	(6.377)	(0.140)	0.889
Proportion ill or injured, last 6 months	0.006	0.045	0.009	0.065	(0.003)	(1.118)	0.264
Frequency of illness or injury, last 6 months	0.550	0.510	0.713	0.506	(0.163)	(1.072)	0.290
Mean days ill or injured, last episode	20.225	31.699	21.340	43.492	(1.115)	(0.096)	0.924
Proportion of children 0–5 years who are stunted	0.707	0.453	0.752	0.418	(0.045)	(1.002)	0.317
Proportion of children 0–5 years who are underweight	0.280	0.439	0.294	0.441	(0.014)	(0.307)	0.759

( ) = negative, HQI = housing quality index, SD = standard deviation, sq m = square meter, SLRs = Sri Lanka rupees.

Note: The null hypothesis H_0: impact ≥ 0.

Source: Asian Development Bank Independent Evaluation Department estimates based on the household survey data.

DEFINITIONS OF OUTCOMES AND DATA USED

1. After examining the values of the variables in the survey, it was determined that some of the observations may not be "valid." Two rules were used to eliminate "invalid" observations. One is imposed throughout the analysis. This refers to loan accounts considered violating the project rules or improbable given the nature of the transactions involved in the project. First are loan amounts above the limits set by the project. From 1998 to 1999, the loan ceiling was set at 100,000 Sri Lanka rupees (SLRs). In 2000, the loan ceiling was increased to SLRs200,000. All loan accounts that exceed these ceilings are considered invalid. Second, since the project was approved in 1998, all loans disbursed before 1998 were not considered valid. While the project was officially terminated in 2005, loan funds continue to stay with the participating credit institutions (PCIs), so loans released after 2005 were considered valid. It was decided, however, that loans after 2007 were too close to the evaluation survey to produce any discernible impacts. Third, we also considered household heads aged less than 20 at the time of loan approval to be improbable since these were loans obtained from formal PCIs. Finally, we considered invalid loan uses that are not among the allowable loan uses, such as land and house purchase before 2000, not specified, and missing.

2. Another rule is used only on a per-outcome variable basis, to eliminate some continuous outcome variables considered outliers. These variables include current house value, current house rental value, and total household income. The basic rule followed is that we consider observations that are way above 3 standard deviations from the mean as outliers. For instance, we did not include households whose reported current house value is SLRs20,000,000. We also excluded households whose reported current house rental value is above SLRs151,182 per month, and we did not include households whose reported total household monthly income is larger than SLRs1,600,000.

3. The results of the aforementioned data omissions are summarized in Table A9.1.

Table A9.1: Data Used in Estimations

Outcome	Definition	Number of Observations Used			Source of Data Omission
		Control	Treatment	Total	
Total valid observations		1,011	911	1,922	valid loan accounts
Housing Quality					
Housing quality index	Composite housing quality index	1,011	911	1,922	valid loan accounts
Current asset value	Current asset value of house	986	889	1,875	mean+3SD
Current rent value	Current rental value of house	992	891	1,883	mean+3SD
Per capita household expenditure, monthly (SLRs)	Total monthly household expenditure/family size	1,011	911	1,922	valid loan accounts
Per capita household income, monthly (SLRs)	Total monthly household income/ family size	1,002	886	1,888	mean+3SD
Household completeness	Household with both parents present	1,011	911	1,922	valid loan accounts
Labor force participation					
Proportion working, both sexes, age 15–65 and not in school	Proportion of members age 15–65 & not in school who are working, both sexes	1,009	910	1,919	Age group
Proportion working, male, age 15–65 and not in school	Proportion of members age 15–65 & not in school who are working, male	953	880	1,833	Age group

Outcome	Definition	Number of Observations Used			Source of Data Omission
		Control	Treatment	Total	
Proportion working, female, age 15–65 and not in school	Proportion of members age 15–65 & not in school who are working, female	985	891	1876	Age group
Education					
Proportion attending school, boys, 5–19 years old	Number of boys 5–19 who are attending school/boys 5–19	400	398	798	Age group
Proportion attending school, girls, 5–19 years old	Number of girls 5–19 who are attending school/girls 5–19	357	373	730	Age group
Mean hours of studying for those studying per day, boys	Number of hours studying per day for boys 5–19 who are attending school/boys 5–19 attending school	356	362	718	Age group
Mean hours of studying for those studying per day, girls	Number of hours studying per day for girls 5–19 who are attending school/girls 5–19 attending school	316	348	664	Age group
Mean number of absences, boys	Number of absences last month for boys 5–19 who are attending school /boys 5–19 attending school	356	362	718	Age group
Mean number of absences, girls	Number of absences last month for girls 5–19 who are attending school /girls 5–19 attending school	316	348	664	Age group
Health					
Per capita health expenditure, monthly (SLRs)	Health expenditure/family size	1,011	911	1,922	valid loan accounts
Proportion ill or injured, last 6 months	Number of members ill or injured/family size	999	903	1,902	reported illness/injury
Frequency of illness or injury, last 6 months	Times ill or injured/members ill or injured	25	20	45	illness/injury incidence
Mean days ill or injured, last illness or injury episode	Days ill or injured during last episode/members ill or injured	25	20	45	illness/injury incidence
Proportion of children 0–5 years who are stunted	Number of stunted children 0–5/ children 0–5	278	140	418	Age group
Proportion of children 0–5 years who are underweight	Number of underweight children 0–5/children 0–5	278	140	418	Age group

SD = standard deviation, SLRs = Sri Lanka rupees.
Source: Asian Development Bank Independent Evaluation Department calculations based on the household survey data.

HAUSMAN TEST RESULTS

Table A10.1: Hausman Test Results by Education of Household Head

	Average		By Education of Household Head			
			Secondary		College	
Outcome Variables	**Chi-sq**	**p-value**	**Chi-sq**	**p-value**	**Chi-sq**	**p-value**
Housing quality index	0.79	0.3730	0.43	0.5102	1.00	0.3178
Current sale value (SLRs)	0.07	0.7976	...	...	4.52	0.0336
Current rental value (SLRs)	3.04	0.0812	0.75	0.3850	2.89	0.0891
Per capita household expediture, monthly (SLRs)	5.17	0.0230	3.58	0.0585	8.50	0.0035
Per capita household income, monthly (SLRs)	0.92	0.3364	0.03	0.8660	2.48	0.1151
Proportion of complete households	2.00	0.1568	6.88	0.0087	0.21	0.6449
Proportion working, both sexes	0.80	0.3721	0.58	0.4464	1.92	0.1657
Proportion working, male	3.05	0.0805	2.21	0.1373	1.34	0.2465
Proportion working, female	0.02	0.8945	1.48	0.2237	0.23	0.6352
Proportion attending school, boys, age 5–19	1.20	0.2731	3.48	0.0621	0.47	0.4949
Proportion attending school, girls, age 5–19	291.08	0.0000	...	...	...	...
Mean hours of studying per day, boys	0.58	0.4472	5.06	0.0245	0.00	0.9813
Mean hours of studying per day, girls	0.11	0.7393	0.17	0.6763	1.10	0.2939
Mean number of absences, boys	0.65	0.4204	2.86	0.0910	1.94	0.1639
Mean number of absences, girls	1.00	0.3175	1.48	0.2230	0.54	0.4626
Per capita health expenditure, monthly (SLRs)	2.40	0.1214	3.63	0.0568	0.74	0.3910
Proportion ill or injured, last 6 months	2.28	0.1309	1.58	0.2090	2.38	0.1227
Frequency of illness or injury, last 6 months	...	...	...	...	2.60	0.1065
Mean days ill or injured, last episode	2.16	0.1416	0.87	0.3511	8.06	0.0045
Proportion of children 0–5 years stunted	4.48	0.0343	4.80	0.0285	4.86	0.0275
Proportion of children 0–5 years underweight	0.14	0.7110	0.70	0.4035	7.50	0.0062

... = not available, SLRs = Sri Lanka rupees.
Note: Chi-square tests with 1 degree of freedom. Shaded cells are with p-value ≤ 0.30, i.e., the test rejects the null hypothesis of no selectivity, indicating there is selectivity. Clear cells are with p-value > 0.30, i.e., the test fails to reject the null hypothesis, indicating there is no selectivity.
Source: Asian Development Bank Independent Evaluation Department estimates based on the household survey data.

Table A10.2: Hausman Test Results by Loan Characteristics

	By loan term				By loan use				By loan period			
	Up to 5 years		More than 5 years		Extension and/or Renovation		Construction		1998–2000		2001–2007	
Outcome Variables	**Chi-sq**	**p-value**	**Chi-sq**	**p-value**	**Chi-sq**	**p-value**	**Chi-sq**	**p-value**	**Chi-sq**	**p-value**	**Chi-sq**	**p-value**
Housing quality index	0.54	0.4608	0.76	0.3845	0.45	0.5027	10.57	0.0011	1.42	0.2339	0.72	0.3962
Asset value	0.58	0.4481	...	...	0.51	0.4745	0.43	0.5130	3.22	0.0728	...	...
Rental value	3.01	0.0827	2.00	0.1577	2.33	0.1269	5.69	0.0171	2.52	0.1127	2.94	0.0862
Per capita monthly expediture (SLRs)	6.45	0.0111	1.04	0.3086	4.87	0.0274	4.97	0.0258	3.02	0.0821	6.10	0.0135
Per capita monthly income (SLRs)	1.54	0.2139	0.12	0.7249	0.99	0.3200	2.44	0.1181	0.28	0.5999	1.77	0.1830
Proportion of complete households	0.79	0.3737	8.45	0.0037	2.60	0.1069	10.07	0.0015	6.69	0.0097	1.74	0.1875
Proportion working, both sexes	0.64	0.4233	0.40	0.5285	1.06	0.3032	0.08	0.7802	4.04	0.0445	0.49	0.4835
Proportion working, male	1.83	0.1761	9.92	0.0016	3.03	0.0815	4.09	0.0432	3.79	0.0515	3.16	0.0757
Proportion working, female	0.07	0.7948	0.77	0.3817	0.07	0.7916	0.27	0.6013	1.18	0.2764	0.03	0.8575
Proportion attending school, boys, age 5–19	1.19	0.2760	0.44	0.5095	1.85	0.1743	1.37	0.2424	0.25	0.6191	1.18	0.2767
Proportion attending school, girls, age 5–19	...	...	...	...	105.53	0.00	...	...	...	...	171.5	0.0000
Mean hours of studying per day, boys	1.29	0.2568	0.08	0.7778	1.16	0.2823	3.27	0.0707	2.15	0.1429	0.50	0.4792
Mean hours of studying per day, girls	0.24	0.6223	0.04	0.8415	0.07	0.7863	0.00	0.9655	0.33	0.5673	0.23	0.634
Mean number of absences, boys	0.16	0.6864	2.76	0.0969	0.63	0.4287	2.43	0.1194	0.78	0.3761	0.75	0.387
Mean number of absences, girls	1.64	0.2008	0.47	0.4946	1.28	0.2570	1.19	0.2750	0.56	0.4552	0.93	0.3348
Per capita health expenditure, monthly (SLRs)	2.11	0.1459	0.82	0.3660	2.51	0.1131	0.45	0.5045	0.96	0.3270	2.25	0.1337
Proportion ill or injured, last 6 months	2.39	0.1223	0.21	0.6503	1.97	0.1601	2.86	0.0907	2.49	0.1144	2.35	0.1256
Frequency of illness or injury, last 6 months	...	...	0.70	0.4014	...	...	...	...	...	...	...	...
Mean days ill or injured, last episode	2.07	0.1507	...	...	0.91	0.3410	2.17	0.1405	56.99	0.00	2.71	0.0997
Proportion of children 0–5 years stunted	6.75	0.0094	8.38	0.0038	5.54	0.0186	2.52	0.1125	...	...	4.60	0.0320
Proportion of children 0–5 years underweight	0.01	0.9085	3.79	0.0515	0.02	0.8975	1.46	0.2272	...	...	0.36	0.5468

... = not available, chi-sq = Chi-square, SLRs = Sri Lanka rupees.

Notes: Chi-square tests with 1 degree of freedom. Shaded cells are with p-value ≤ 0.30, i.e., the test rejects the null hypothesis of no selectivity, indicating there is selectivity. Clear cells are with p-value > 0.30, i.e., the test fails to reject the null hypothesis, indicating there is no selectivity.

Source: Asian Development Bank Independent Evaluation Department estimates based on the household survey data.

IMPACT ESTIMATION RESULTS

Table A11.1: Matching Estimates by Education of Household Head

	Average		By Education of Household Head			
			Secondary		College	
Outcome Variables	**Diff**	**p-value**	**Diff**	**p-value**	**Diff**	**p-value**
Housing quality index	0.009	0.048	0.013	0.016	0.008	0.116
Current asset value (SLRs)	285,785	0.124	236,238	0.224	(174,578)	0.300
Current rental value (SLRs)	1,171	0.119	493	0.215	1,971	0.072
Per capita household expediture, monthly (SLRs)	739	0.094	191	0.331	825	0.150
Per capita household income, monthly (SLRs)	1,098	0.011	588	0.092	165	0.433
Proportion of complete households	(0.005)	0.392	(0.019)	0.146	0.026	0.072
Proportion working, both sexes	0.024	0.077	(0.013)	0.258	0.070	0.006
Proportion working, male	0.024	0.173	0.017	0.278	0.015	0.316
Proportion working, female	0.062	0.017	(0.032)	0.224	0.101	0.003
Proportion attending school, boys, age 5–19	0.022	0.275	0.034	0.232	0.020	0.274
Proportion attending school, girls, age 5–19	(0.020)	0.275	0.106	0.003	0.090	0.011
Mean hours of studying per day, boys	0.096	0.344	(0.376)	0.139	0.118	0.327
Mean hours of studying per day, girls	0.293	0.090	(0.236)	0.188	0.809	0.002
Mean number of absences, boys	(0.162)	0.081	(0.122)	0.219	(0.350)	0.036
Mean number of absences, girls	(0.100)	0.116	(0.299)	0.044	(0.058)	0.307
Per capita health expenditure, monthly (SLRs)	(166.513)	0.120	(338.39)	0.029	54.28	0.116
Proportion ill or injured, last 6 months	(0.016)	0.009	(0.014)	0.062	(0.021)	0.000
Frequency of illness or injury, last 6 months	(0.236)	0.062	(0.207)	0.053	(1.009)	0.000
Mean days ill or injured, last episode	(5.984)	0.346	4.671	0.306	(18.69)	0.174
Proportion of children 0–5 years stunted	0.019	0.402	0.129	0.084	(0.131)	0.062
Proportion of children 0–5 years underweight	0.014	0.401	0.011	0.435	(0.087)	0.160

( ) = negative, Diff = difference, SLRs = Sri Lanka rupees.
Notes: Shaded cells contain estimates based on restricted control households (p-value ≤ 0.30 in the Hausman test).
Clear cells contain estimates based on all control households (p-value > 0.30 in the Hausman test).
Source: Asian Development Bank Independent Evaluation Department estimates based on the household survey data.

Table A11.2: Matching Estimates by Loan Characteristics

	By loan term				By loan use				By loan period			
	Up to 5 years		More than 5 years		Extension and/or Renovation		Construction		1998–2000		2001–2007	
Outcome Variables	**Diff**	**p-value**	**Diff**	**p-value**	**Diff**	**p-value**	**Diff**	**p-value**	**Diff**	**p-value**	**Diff**	**p-value**
Housing quality index	0.008	0.089	0.012	0.080	0.008	0.057	(0.002)	0.439	0.002	0.399	0.009	0.058
Asset value	240,786	0.157	565,956	0.129	293,236	0.127	255,564	0.251	462,632	0.132	198,138	0.217
Rental value	1,247	0.113	710	0.315	1,566	0.054	(1,460)	0.201	1,838	0.080	1,058	0.148
Per capita monthly expediture (SLRs)	468	0.192	2,566	0.001	764	0.083	268	0.385	2,423	0.013	375.000	0.228
Per capita monthly income (SLRs)	779	0.130	(68)	0.466	1,320	0.003	(826)	0.244	1,480	0.054	964.000	0.019
Proportion of complete households	0.006	0.337	(0.015)	0.295	(0.004)	0.419	(0.018)	0.232	0.006	0.407	(0.007)	0.333
Proportion working, both sexes	0.040	0.013	(0.035)	0.094	0.029	0.047	(0.013)	0.334	0.034	0.149	0.029	0.045
Proportion working, male	0.027	0.153	0.007	0.427	0.020	0.222	0.056	0.062	0.003	0.468	0.032	0.108
Proportion working, female	0.082	0.004	(0.002)	0.485	0.080	0.004	(0.045)	0.191	0.091	0.047	0.064	0.017
Proportion attending school, boys, age 5–19	0.001	0.489	0.072	0.038	0.013	0.375	0.089	0.013	(0.014)	0.383	0.026	0.249
Proportion attending school, girls, age 5–19	0.083	0.011	0.132	0.002	(0.025)	0.248	0.071	0.040	0.078	0.065	(0.015)	0.332
Mean hours of studying per day, boys	(0.070)	0.406	0.062	0.429	(0.102)	0.364	0.356	0.172	0.049	0.454	0.075	0.378
Mean hours of studying per day, girls	0.247	0.150	0.472	0.056	0.365	0.048	0.139	0.373	0.397	0.121	0.278	0.108
Mean number of absences, boys	(0.215)	0.039	(0.266)	0.150	(0.222)	0.027	(0.083)	0.373	(0.468)	0.007	(0.107)	0.180
Mean number of absences, girls	(0.238)	0.032	(0.004)	0.484	(0.226)	0.029	(0.186)	0.256	(0.060)	0.280	(0.100)	0.129
Per capita health expenditure, monthly (SLRs)	(148.700)	0.154	(11.792)	0.411	(185.600)	0.108	25.642	0.308	98.378	0.210	(167.000)	0.101
Proportion ill or injured, last 6 months	(0.017)	0.015	(0.008)	0.017	(0.016)	0.013	(0.015)	0.028	(0.022)	0.010	(0.015)	0.014
Frequency of illness or injury, last 6 months	(0.235)	0.073	(0.209)	0.190	(0.224)	0.088	(0.447)	0.084	(1.425)	0.004	(0.219)	0.084
Mean days ill or injured, last episode	(8.960)	0.278	42.208	0.037	3.801	0.363	38.963	0.035	(128.600)	0.000	(5.399)	0.363
Proportion of children 0–5 years stunted	0.053	0.256	(0.168)	0.084	0.038	0.319	(0.077)	0.255	(0.184)	0.126	0.032	0.345
Propotion of children 0–5 years underweight	0.021	0.367	(0.137)	0.137	0.007	0.457	(0.030)	0.398	(0.131)	0.191	0.030	0.302

( ) = negative, Diff = difference, SLRs = Sri Lanka rupees.

Notes: Shaded cells contain estimates based on restricted control households (p-value ≤ 0.30 in the Hausman test).
Clear cells contain estimates based on all control households (p-value > 0.30 in the Hausman test).

Source: Asian Development Bank Independent Evaluation Department estimates based on the household survey data.

COMMUNITY-LEVEL ANALYSIS

1. The community survey was administered in 15 *grama niladhari* (GN) divisions with project borrowers (project/treatment communities) and in 15 GN divisions with no project borrowers (non-project/control communities).[1] Key features of the treatment and control communities are in Table A12.1. The communities cover the full range of Sri Lanka's geography. All of them are small and have small populations. On average, 6% of households in treatment divisions and 4% in control divisions live in improvised shelters. The treatment and control communities are equally well served by electrical and water systems. They have equally good access to schools and medical facilities, and access to public transportation is 100%. Both types of communities have housing-related projects provided by the government, nongovernmental organizations, or foreign donors.[2]

Table A12.1: Basic Community Features

Features	Project Communities	Non-Project Communities
Coastal and inland delta (number)	5	5
Hills and midlands (number)	7	6
Low and high mountains (number)	3	4
Average area (sq km)	2.85	4.2
Average population	3,067	1,923
Percent in improvised shelters	6	4
Percent with electricity	94	92
Percent with water service	78	79
Percent with public transport	100	100
Average distance to school (km)	2.69	2.74
Average distance to medical facility (km)	8.06	6.59
Housing-related projects (number)	23	16

km = kilometer, sq km = square kilometer.
Source: Asian Development Bank Independent Evaluation Department estimates based on the community survey data.

2. The household survey sought evidence on household engagement with government programs and community activities. Very high proportions of households claimed membership in community organizations and participation in community activities, and the proportions were statistically significantly greater among households in the control group (Table A12.2). This may seem to contrast with some GNs' views that participation in GN division affairs had diminished since 1998.[3] Table A12.3 shows that about 62% of treatment household heads rated their communities as peaceful, over 55% indicated high levels of trust in their neighbors, and 40%–44% indicated high levels of trust in their community leaders. Finally, the proportions of treatment households that reported benefiting from government programs related to credit, training, housing, clean water, and agricultural extension were quite low and there were no significant differences between control and treatment households (Table A12.4). On the other hand, the focus group discussions produced a number of comments that demonstrated a concern for the poor. Most of

[1] The administrative structure of Sri Lanka is as follows: national, province, district, divisional secretariat (DS), and *grama niladhari* (GN) division—the officials of the latter being *grama niladharis* (GNs). The GN division is the lowest formal administrative unit.

[2] We do not calculate tests of significance for differences in control and treatment communities because the sample sizes are too small.

[3] The difference might have been due to the framing of the question to the GNs, which could have been interpreted as assessing interest in local politics. The question was: "In your opinion, compared to 1998, how is participation in GN division affairs today?" On the other hand, information from focus group discussions supports a different notion of "community involvement"—that it refers to events like funerals and weddings.

the commentators observed that the housing finance project was not available to the poor and recommended that future projects target the poor, especially the landless poor.

Table A12.2: Participation in Community

	Member of Any Community Organization		Participation in Community Activities	
Response	**Control**	**Treatment**	**Control**	**Treatment**
Yes	79.43	74.62	77.35	72.00
No	20.38	25.16	21.07	27.12
Don't know/missing	0.20	0.22	1.58	0.87
Total respondents	1,011.00	918.00	1,011.00	918.00
Chi-sq and p-value	7.66 (0.054)		12.69 (0.005)	

Note: Numbers in parentheses are p-values.
Source: Asian Development Bank Independent Evaluation Department estimates based on the community survey data.

Table A12.3: Assessments of Peacefulness and Trust

	Peaceful?		Trust Neighbors?		Trust Community Leaders?	
Response	**Control**	**Treatment**	**Control**	**Treatment**	**Control**	**Treatment**
Very little	8.61	9.69	3.86	2.83	4.65	5.77
Little	10.98	8.50	12.07	12.96	21.46	21.24
Neutral	18.30	18.08	27.00	27.67	26.90	31.92
Much	55.09	55.56	53.71	51.42	41.35	36.82
Very much	6.63	7.19	2.77	4.90	3.26	3.26
Don't know/missing	0.40	0.98	0.59	0.22	2.37	2.37
Total respondents	1,011.00	918.00	1,011.00	918.00	1,011.00	918.00
Chi-sq & p-value	7.24 (0.30)		15.80 (0.03)		10.02 (0.12)	

Note: Numbers in parentheses are p-values.
Source: Asian Development Bank Independent Evaluation Department estimates based on the community survey data.

Table A12.4: Participation in Government Programs

	Preferred Credit or Subsidy		Vocational Training		Housing Support		Clean Water Programs		Agricultural Extension	
Response	**Cont**	**Treat**	**Cont**	**Treat**	**Cont**	**Treat**	**Cont**	**Treat**	**Cont**	**Treat**
Yes	14.64	11.55	4.35	5.45	3.26	2.94	13.16	14.38	1.78	1.09
No	85.06	88.13	95.35	93.90	96.34	96.41	86.45	84.86	97.43	97.43
Don't know/missing	0.30	0.33	0.30	0.65	0.40	0.65	0.40	0.76	0.79	0.76
Total respondents	1,011	918	1,011	918	1,011	918	1,011	918	1,011	981
Chi-sq & p-value	5.23 (0.16)		2.60 (0.27)		0.7790 (0.68)		1.802 (0.41)		1.614 (0.45)	

Cont = control households, Treat = treatment households.
Note: Numbers in parentheses are p-values.
Source: Asian Development Bank Independent Evaluation Department estimates based on the community survey data.

Table A12.5: Household Credit Portfolio

Credit Programs	Control [a]	Treatment		
		Other Loans	Program Loans	All Loans
Number of households listing largest loan amounts	359	251	621	872
Largest Loan Average Amount (SLRs)	135,160	378,729	94,834	176,551
Number of households listing second-largest loan amounts	82	181	187	368
Second-largest loan average amount (SLRs)	126,878	197,486	84,898	140,274
Number of households listing third-largest loan amount	12	37	59	96
Third-largest loan average amount (SLRs)	52,083	168,243	84,000	116,469
Number of households listing fourth-largest loan amount	2	6	11	17
Fourth-largest loan average amount (SLRs)	75,000	93,333	91,364	92,059
Total number of loans	455	475	878	1,353
Average loan amount (SLRs)	131,212	289,665	91,946	161,360

[a] Control households do not have project loans. All their loans are other loans.
SLRs = Sri Lanka rupees.
Source: Asian Development Bank Independent Evaluation Department estimates based on the community survey data.

MANAGEMENT RESPONSE TO THE IMPACT EVALUATION STUDY ON ASIAN DEVELOPMENT BANK'S ASSISTANCE FOR LOW-INCOME HOUSING FINANCE IN SRI LANKA

On 14 September 2011. the Director General, Independent Evaluation Department received the following responses from the Managing Director General on behalf of the Management.

I. General Comments

1. We appreciate IED's Impact Evaluation Study (IES) on ADB's Assistance to Low-Income Housing (LIH) Finance in Sri Lanka. We find the statistical evaluation framework and estimation methodology sound and informative, also taking into account data limitations such as limited availability of baseline data.

2. At the same time, we have some concern on potential risks of suggesting generalized findings based on only one operation, i.e., Urban Development and Low Income Housing project (Loan number 1632). Since the IES is solely based on a particular operation in Sri Lanka, it needs to be carefully considered whether IES findings can credibly be generalized beyond the operation being evaluated given the methodology adopted, limited evidence and the small sample size.

3. Furthermore, the scope of the IES is limited to housing financing aspect of the project without assessing other project components, including urban infrastructure and community development. As also noted by the IES, it would be difficult to control for the impact of other project components, especially when the Project was designed for a whole set of coherent intervention and not as a set of mutually exclusive activities. This had led to limitation in drawing more useful implications on various aspects of the project, we believe.

II. Comments on Specific Recommendations

4. **Recommendation 1: Improve the analysis and design of LIH projects for better targeting and greater welfare impacts.** We agree with this general recommendation. We also acknowledge that targeting poorer households could make the welfare impacts of the project more robust. However, it should be noted that targeting of the poorest households was not the thrust of the Project. The objectives of the Project were to increase the access of low-income households to market-based housing finance through the formal sector, and to galvanize the interest of the formal banking sector to serve the low-income segment of the housing market. Hence, the Project was focused on enhancing access to the formal banking sector for creditworthy but relatively lower-income households rather than to the poorest. This could explain why only 1% of borrowers were in the lowest 10 percentiles of the income group. If the objective of the Project was targeting the poorest households, a different approach and project design would have been employed.

5. **Recommendation 2: Increase gradually the collection and maintenance of baseline data on selected projects amenable for impact evaluation.** We agree. Having credible baseline data is important for possible future impact evaluations (IEs) that will help demonstrate development effectiveness. In this regard, it should be worth mentioning that ADB has taken several steps to scale up and mainstream IE in its

operations. An IE initiative launched at a Heads of Departments meeting held in May 2009 helped kick off IE mainstreaming practices at ADB, including two IE staff training programs held in 2010.

6. An initial drive for an ADB-wide IE initiative is being pursued through a RETA on "implementing Impact Evaluation at ADB" with $1 million since December 2010. This RETA supports various IE activities in regional departments, recognizing that counterfactual identification and baseline surveys are best started early in the project cycle, as part of the project monitoring and evaluation system. An impact evaluation committee comprising ERD, RSDD, COSO and the regional departments, and co-chaired by the regional departments, has oversight responsibilities on reviewing and approving project proposals and budgets to be considered for impact evaluation from the RETA. It also includes awareness-building and training for ADB's developing member countries. While more resources will need to be mobilized to enable further scaling-up of IE in ADB, the institutional roles for IE are now being mapped out with ERD playing a key technical support function, RDs implementing IE activities as part of the project cycle, and COSO helping facilitate a better link between design and monitoring frameworks and IE activities.

DEVELOPMENT EFFECTIVENESS COMMITTEE OF THE BOARD

Chair's Summary of the Committee Discussion on 29 September 2011

I. DISCUSSION HIGHLIGHTS

A. Rigorous Impact Evaluation: Low-Income Housing Finance in Sri Lanka

1. IED staff explained that the impact evaluation was conducted on the housing finance component of the urban development and low-income housing (sector) project in Sri Lanka. The project provided small housing loans to households with income levels below the 55th percentile of the income distribution. The evaluation was based on household surveys conducted by IED, with a sample of 2,022 households, looking at the socioeconomic impact in six areas: physical condition of housing, housing income and expenditure, housing completeness, labor force participation, school-age children's education, and health indicators. The project's housing finance component had three objectives: (i) to promote access to housing loans for low-income persons; (ii) to promote banks' interest in providing housing loans to low-income households; and (iii) to improve housing conditions and quality of life for borrowers. IED concluded that the project was successful for objectives (i) and (ii) but not for objective (iii), particularly in terms of social welfare improvement.

2. IED's findings showed that only about 1 per cent of the project beneficiaries were in the lowest 10 per cent income group while about 85 per cent were middle-income or near middle-income groups. IED noted only marginal social impact to the beneficiaries because the majority of the borrowers were already in the middle or near middle-income groups who already had quite good education with children in school and relatively good health indicators. A lesson drawn was that the project could have better selected its target group.

3. Another finding related to the housing loan design: loans had small average amounts, about 4.5 per cent of the present value of a house which allowed borrowers to be able to make only marginal improvements in their houses rather than major renovations. Many project households therefore borrowed additionally from other sources to improve their houses and thus added immediate payment pressures. In addition, nearly 80 per cent of the beneficiaries borrowed with short-term loans of less than five years. Repayment pressures made the borrowers less attentive to activities to improve welfare measures such as education and health. The project therefore had lower impact in terms of longer-term welfare indicators.

4. SARD staff highlighted the effectiveness of the project in delivering on its objectives in targeting the low-income housing market segment. She clarified that while the project was designed to serve the bottom of the pyramid of the low income market, it was not specifically designed to serve the base of the bottom of the pyramid. The project tested the extent to which support could be provided on market-based financing terms for income levels below the 55th income percentile. The project relied on specialized financial institutions with a mandate to support housing development in this market. The majority of funding for this low-income housing segment was provided by the Housing Development Finance Corporation representing 69 per cent of all disbursements, with only 3.5 per cent of disbursements provided by commercial banks and 28 per cent from regional development banks. These financial institutions were required by the Central Bank of Sri Lanka to meet strict eligibility criteria, including tests of financial soundness and creditworthiness. At the same time, participating institutions had to contribute their own capital to the program (which represented 26 per cent of total funding).

5. DEC requested clarification from staff on the relatively high interest rate charged by the participating financial institutions. SARD staff indicated that financial institutions subscribed to the prevailing market rate, and those were the conditions under which support had to be provided under very strict eligibility requirements provided by the Central Bank.

B. Attainment of Project Objectives

6. In reference to the third objective of the project's housing finance component of facilitating improvements of housing conditions and quality of life, SARD staff opined that given the size of the loans provided, with hindsight, there may have been a possible lack of congruence between the size of the loan amounts provided and the component's stated objective. Most of the loans supported housing renovations while housing purchases comprised a very small part of the total loans. At the same time, however, she emphasized that the project delivered in terms of providing low income households with access to market-based loans and demonstrated that financial institutions were prepared to provide market-based financing to the bottom of the pyramid. An important questions was whether the financial institutions involved continued to serve the lower income market segments after the project was completed in 2006. IED staff indicated that it had looked at how the ADB housing loan had served to leverage other sources, including from commercial banks. The impact evaluation found the project to be successful in facilitating access to finance.

7. In terms of the sustainability of the housing finance component, SARD staff indicated that it would be useful to measure to what extent the government's own alternative program for low-income housing which it had established in 2003 had specifically targeted and effectively served the base of the bottom of the pyramid which the ADB project did not purposely target. Had the government's own program resulted in financial institutions further expanding their outreach and support to the lowest income segments, there would have been little need for and value addition from a housing revolving fund.

8. A DEC member asked about the capacity of the housing finance sector in general. IED staff explained that the project provided loans through several participating institutions, such as Housing Development Finance Corporation, Hatton National Bank, Regional Development Bank and Bank of Ceylon. IED staff noted that while it did not evaluate the capacity of these institutions because it was not part of the impact evaluation, but databases of financial institutions were reviewed during the household surveys. It was observed that only about 55 per cent of loan records were available. Furthermore, some inconsistencies were found in the household records relating to household income and location. This indicated the relatively weak capacity of the information systems. However, in staff's view, there did not appear to be any major problems with regard to loan performance. In terms of governance, IED staff noted that these are well established banking institutions.

9. IED staff noted that the evaluation suggested that the project did not really reach the very poor on socioeconomic aspects while international experience in other countries, such as Mexico, showed that the poorest could indeed be reached. IED staff noted that given the average loan sizes, health conditions were unlikely to be improved. Socioeconomic benefits could therefore have been targeted differently. It was also noted by IED that if further development of the financial sector was envisaged, one housing loan was not enough and a follow-up phased approach would be needed.

10. A DEC member indicated that it was clear from the objective of the project that the aim was not to finance the poorest people but to promote and develop housing financing through the

formal financial/ banking sector. If the project had been targeting the poorest households, a different approach and project design would have been adopted.

11. SARD staff reinforced that the project comprised multiple components of intervention and therefore multiple objectives, outputs and outcomes. The project had a substantial urban infrastructure component, comprising 62 per cent of total project cost with the housing loan component comprising only 26 per cent of total cost. With respect to the objective of improving access of low income households to market based housing finance, the project was implemented as designed. IED staff clarified that the objective of the impact evaluation study was to evaluate if the project assisted in terms of the socioeconomic impacts of the housing finance component.

12. A DEC member opined that longer loan terms with lighter repayment burdens could have increased household welfare and the poverty impact. He welcomed the fact that women's average labor force participation was significantly improved, although only in households with higher education levels, and suggested these lessons be considered for designing future projects.

13. DEC members noted that the overall effect of housing loans on poverty reduction was limited because the households that couldn borrow money from banks were not so poor and tended to have some savings as well as jobs. Thus, the estimated welfare impact of the housing loans on employment, education and health was limited and indirect. Some DEC members recommended that given ADB's limited resources and in line with the Millennium Development Goals, ADB consider targeting support at the poorest households in a more efficient and effective way. One DEC member noted, however, that the poorest households do not have collateral to provide against loans, and cannot afford to repay the loan installments in short periods.

14. SARD staff referred to the project's framework which clarified that health and other socioeconomic benefits were to be delivered by other components of the project. According to this framework, the low-income housing component did not specifically indicate the objective of improving health conditions, but that of ensuring that participating credit institutions support low-income households with housing finance. The objective of improving environmental and health conditions was expected to be delivered through the urban infrastructure component which provide infrastructure to improve storm water drainage, solid waste management and sanitation facilities, among others. IED staff pointed out that the third objective of the low-income housing finance component related to improving housing conditions and quality of life for the beneficiaries. The latter included education and health outcome indicators studied in the impact evaluation.

C. Absence of Baseline Data

15. Absence of baseline data was highlighted as a problem in undertaking impact evaluation studies. A DEC member noted that IED recommended that sufficient resources, both funding and staff skills, need to be provided to produce baseline surveys. He asked if there were alternatives to conduct impact evaluations without having to rely on expensive baseline surveys.

16. SARD staff indicated that regional departments were fully committed to ensuring the availability of credible baseline data for impact evaluations given their importance on credibly assessing development outcomes and effectiveness. She added that regional departments were carefully prioritizing projects for impact evaluation which corresponded to the leading

priorities of client DMCs. Simultaneously, they were mindful of the time intensiveness and the costs involved. IED indicated that it was useful to have data development incorporated into project operations. This would be cheaper than creating surveys to generate the data after the project is completed. He noted that surveys were only done for selected projects amenable for impact development.

II. CONCLUSION

17. DEC welcomed the impact evaluation study of ADB's assistance for low-income housing finance in Sri Lanka. The matching estimation method used for studying the welfare impact of the housing loans provided useful insights into the development effectiveness of housing finance loans. Of the $102.99 million loan to Sri Lanka approved in 1998, a little over a quarter was meant for low-income housing. There were important benefits from the project including an improved access to finance on a continued basis for those households which were beneficiaries of the housing finance project and higher labor force participation of women for those households which availed of the housing finance loans. However, some DEC members saw scope for improvement in increasing the welfare impact of such loans by improved targeting of the poor. DEC encouraged staff to monitor the rates of interest at which loans were on-lend by the participating financial institutions and also to devise terms which would be useful for the poor, particularly in terms of appropriate maturity.

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