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Evaluation of Slum Upgrading Interventions - Methodological Approaches

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Abstract. This work addresses slums definition according to UN-Habitat, and provides some objectives of impact evaluation of slum upgrading projects. The main objective is to clarify the importance behind the slum upgrading projects (interventions), through over viewing the slum upgrading interventions and their main characteristics then summarize methodology of evaluation studies. This paper gives an overview of counterfactual question, qualitative and quantitative methodologies discusses main strategies to control bias in Quasi-experimental approaches, and provides a summary about common past evaluation challenges and recommendations which can be applied to future work.

1. Introduction

The normal growing of the urban residents combined with the adding of rural immigration to towns formed a fast urbanization in the developing world over the last several years. Rural to urban migration is driven by the better labour opportunities and higher standards of living that are available in the cities [1]. Cities let people and companies enjoy the profits that come from the agglomeration of resources, although cities offer several economic chances and contact to better facilities and services, these benefits do not reach all city residents. Glaeser[1] classifies the three great scourges of urban life: crime, disease, and congestion.

The United Nations (UN) estimates that nearly one billion people worldwide currently live in slums (one-sixth of the planet's population). By 2030, nearly five billion people will live in urban areas, compared to 3.2 billion in 2007. Upgrading projects focus on providing basic facilities to improve poor communities. Due to expected growths in slum residents, the request for urban upgrading interventions is probable to increase. Investing resources in slum upgrading developments must perfectly be constructed on strong indication of which exact interventions are more effective. Since the several methods of upgrading interventions and the complications met in implementation, assessing their effect can be complex.



According to UN-Habitat, a slum household is a group of individuals living under the same roof, lacking one or more of the following conditions (UN-Habitat)[2]: (i) access to safe water: sufficient amount of it (20 liters/person/day), at an affordable price (less than 10 percent of the total household income), available without being subject to extreme effort (less than one hour a day of walking time); (ii) access to improved sanitation: access to an excreta disposal system, either in the form of a private toilet or a public toilet shared with a reasonable number of people; (iii) sufficient living area: fewer than three people per habitable room; (iv) structural quality/durability of dwellings: a house built on a nonhazardous location and with a permanent structure adequate enough to protect its inhabitants from the extremes of climatic conditions; and (v) security of tenure: the right to effective protection by the State against arbitrary unlawful evictions

1.1 Slum upgrading projects

Provision of basic services to improve the lives of poor communities, including both infrastructure and social interventions.

1.1.1 Infrastructure interventions:

Providing slums with physical basic facilities such as water, sanitation, waste collection, housing, access roads, footpaths, lighting, public telephones, schools, hospitals, etc.

1.1.2 Social interventions:

Focus on providing insecure tenure, health services, education services, day care, training, social protection programs, etc.

1.2 Why are slum upgrading projects (interventions) important?

The need for slum upgrading interventions grow as a result of continuous increases in slum population, which makes it an important component of the development process, that's why governments have undertaken several approaches to deal with informal settlements.

1.3 What are the main strategies of slum upgrading interventions and their basic characteristics?

Table 1. Slum upgrading interventions and their main characteristics

Intervention	Main characteristics
Eradication strategy	<ul style="list-style-type: none"> - It is an expensive method, as governments must provide homes for displaced population. - It is still practiced in some countries.
Site and services	<ul style="list-style-type: none"> - It was a popular approach in the 1970s - The main idea of this strategy is to provide urban lots for families that were removed from slums to build their homes step by step. - This strategy was not successful because it mostly leaves families in worse conditions than they were in the original slums.

In situ slum upgrading

- This concept was experienced by governments since the 1980s.
- This strategy based on the idea that it is socially and economically more effective for residents to stay in their communities.
- The aim of this intervention is the integration of poor communities with their larger urban context.
- It keeps the social networks of the dwellers, while improving their living standards.
- Due to the success of this strategy, it was implemented in many programs of slum upgrading projects.
- the implementation of this strategy ranged from land tenure and ranging all the way to more complete versions including infrastructure projects, housing improvement, access roads and others.

By author

- Which is the most effective slum upgrading intervention for both: politicians and slum residents?
- How can officials improve slum upgrading interventions to meet the requirements of the urban poor? These questions can be replied by running suitable impact evaluation studies.

2 Methodology of evaluation studies:

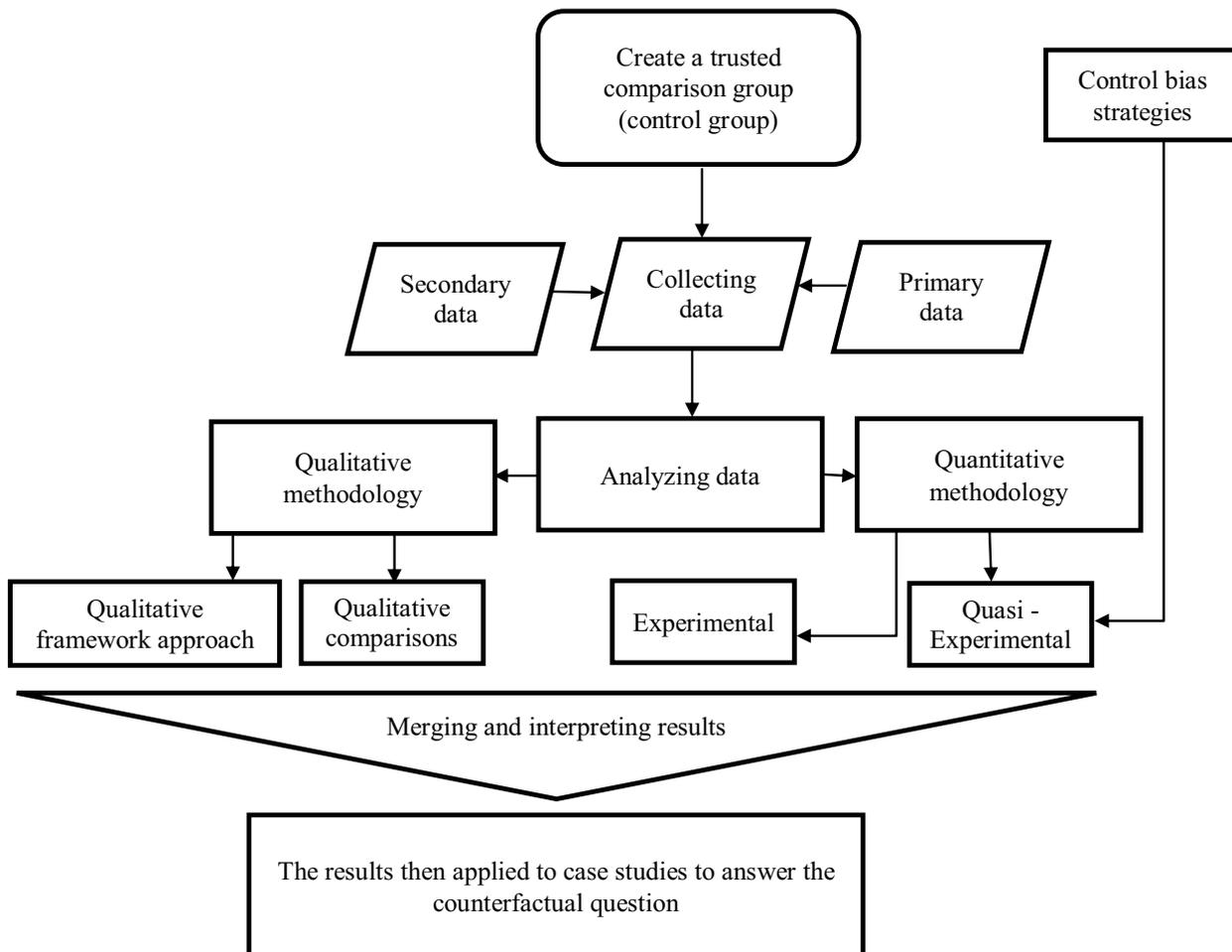


Figure 1: Methodology of evaluation studies

Although there are many slum upgrading programs, there are few studies designed to identify the causal effects of a program. Evaluating the causal effects of slum upgrading interventions on different outcomes is a complex task. Any impact evaluation tries to answer a fundamentally counterfactual question[3]: How would individuals who participated in the program have fared in the absence of the program? How would those who were not exposed to the program have fared in the presence of the program?

Answering these questions is difficult because:

- Slum household is either exposed or not exposed to the upgrading intervention program.
- Comparison for the same person by time will not, usually, give a dependable estimation of the effect the program had on him or her, as several other circumstances possibly will have differed at the same time as the program was presented.
- So, it is obvious that seeking for getting an estimation of the effect of the program on each person is not practical.
- To be able to get the average effect of the program on a group of people by making comparison between them and other similar group of individuals who were not exposed to the program is all we can hope for.
- The main goal of impact evaluation is to create a trusted comparison group, which allows us to get an estimation of the average impact on the group in question.
- So, the idea of establishing a reliable comparison group is crucial to any impact evaluation.
- *But, in reality it is mostly unlike because:* programs may be located in poorer or richer areas for example. Individuals might be chosen for participation in the program on different basis like poverty, motivation or any other basis. For these reasons, those who were not exposed to a program are often not a good comparison group for those who were.

2.1 Qualitative and quantitative methodologies:

To resolve the evaluation problem, program evaluations naturally require to be wisely planned previously to specify which group is a probable control group. Many different empirical approaches and strategies have been used in impact evaluation, involving both *qualitative* and *quantitative* methodologies.

2.1.1 *Qualitative methodologies:* due to past impact evaluations, be broken into four broad categories as shown in Fig.1.

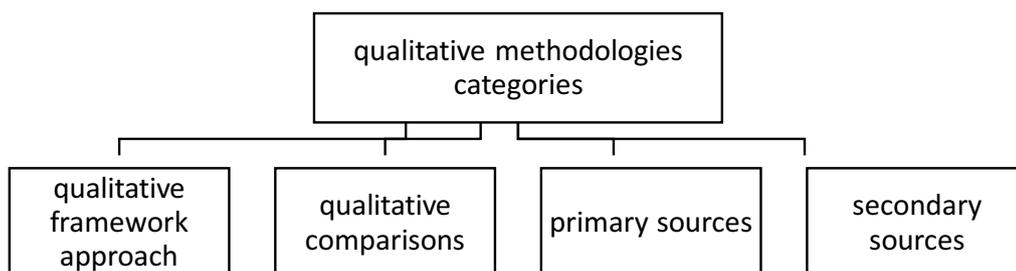
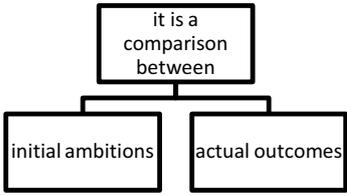


Figure2.Qualitative methodologies main categories

Table 2.Qualitative methodologies categories

Qualitative framework approach	Qualitative comparisons	Primary sources	Secondary sources
<div style="text-align: center;">  <pre> graph TD A[it is a comparison between] --> B[initial ambitions] A --> C[actual outcomes] </pre> </div> <p><u>this comparison is made by:</u></p> <ul style="list-style-type: none"> -Defining concepts. -Describing and mapping dynamics between actors and institutions -Categorizing residents’ attitudes and perceptions. <p>The resulting evaluation framework is then applied to available data and case studies[2, 4, 5].</p>	<p><u>Comparing case studies of two or more slum upgrading projects</u>[2].</p> <p><u>This comparison is made by:</u> considering the relevant merits of different slum approaches on specific indicators of interest, such as:</p> <ul style="list-style-type: none"> - physical topography [6]. - land ownership and residential mobility [2]. - long-term sustainability[7] <p>-Qualitative comparisons have also been used to measure institutional roles and community cooperation, including residents’ roles and relationships in different communities[4, 5].</p>	<p>Based on information gathered from:site visits, fieldwork, focus group, in-depth interviews with participants, technicians, officials, NGO staffs, household surveys of participants’ satisfaction and perceptions, and direct observation [2, 4, 8].</p>	<p>Rely on:news articles, reports, government documents, and other evaluations to draw conclusions about project impact[7-13].</p>
		<p>Most commonly used to support results from quantitative assessment.</p>	

By author

2.1.2 Quantitative approaches:

Table 3.Quantitative methodologies categories

Experimental	Quasi-experimental
<ul style="list-style-type: none"> -Implemented prospectively before project implementation. -Evaluators choose one or more project components like (individuals, communities, schools or classrooms). -Evaluators measure changes overtime in treatment relative to control populations with follow-up data. -Differences between the outcomes of the groups attributed to the program. 	<ul style="list-style-type: none"> - Implemented retrospectively after project implementation, based on available data. - They may contain large and unknown biases resulting from specification errors. - Researchers have developed alternative techniques to control for bias in retrospective evaluations as well as possible like: comparable strategy, difference-in-difference strategy (DID) and regression discontinuity design strategy.

By author

Table 4.Summary of Main Strategies to control bias in Quasi-experimental approaches

Control bias strategy	comparable strategy	difference-in-difference strategy (DID)	Regression discontinuity design strategy
methodology	<ul style="list-style-type: none"> - Depends on identifying all the differences between treatment and control groups. - Attempt to find a control group that is as “comparable” as possible to the treatment group along observable dimensions. 	Compare the growth in the variables of interest between program and non-program regions.	Takes advantage of the fact that program rules sometimes generate discontinuities that can be used to identify the effect of the program by comparing those who made it to those who “almost made it.” That is, if resources are allocated on the basis of a certain number of points, it is possible to compare those just above to those just below the threshold.
limitations	In cases where the treatment is assigned on the basis of a variable that is not observed by the researcher (demand for the service, for example), this technique can lead to misleading inferences.[3]	<ul style="list-style-type: none"> - Not granted. - Cannot be tested. - To achieve reasonable results, we need to collect long time series of data before starting the program. Evaluators should be sure that no other program was implemented at the same time. Bertrand, Duflo and Mullainathan[14]found that difference-indifference estimations can severely bias standard errors.	Often cannot be implemented, especially in developing countries because often the case that rules are not obligatory strictly enough to generate discontinuities that can be used for identification purposes.

2.2 Drawbacks of Quasi-experimental approaches

They may contain large and unknown biases resulting from specification errors. Glazer et al. found that retrospective estimators often produce results dramatically different from randomized evaluations, that the estimated bias is often large, and that they were unable to identify any strategy that could consistently remove bias and still answer a well-defined question. A number of comparative studies have been conducted - some of which suggest omitted variables bias is a significant problem, others which suggest non-experimental estimators may perform well in certain contexts.

Several studies in Kenya have provided evidence that estimates from prospective randomized evaluations can often be quite different from estimated effects in a retrospective framework, suggesting that omitted variable bias is a serious concern[15, 16].

Glewwe et al. [14] study found that: it is not clear that such a difference-in-difference approach has general applicability.

Similar differences between retrospective and prospective randomized estimates arise in studies of the impact of de-worming in Kenya[14].

To address these concerns, future researchers should conduct retrospective evaluations before the results of randomized evaluations are released or conduct blind retrospective evaluations without knowledge of the results of randomized evaluations or other retrospective studies.

Project evaluation with non-randomized approaches must be undertaken with extreme attention because they are less transparent and more subject to deviation of estimation than projects evaluated with randomized approaches. Moreover, the differences between respectable and non-respectable non-randomized evaluations are hard to be found out, especially to strategy makers, because of all the cautions that must be taken with concern with the outcomes. These cautions may never be given to strategy makers, and even if the cautions are given, they might be unnoticed: so, strategy makers are completely misled[17].

It is recommend that while non-randomized approaches will remain to be required; there had better to be an obligation to run randomized evaluations where possible.

3 Common evaluation challenges

Past evaluations have met difficulties in the following parts of impact assessment:

3.1 Complementary programs:

Importance of complementary programs	<p>A serious factor of the profits of slum interventions is the extent to which complementary services and programs reply to public progress.</p> <p>For example, the value of road construction relies deeply on the degree to which bus service station continue to arrive the districts.</p> <p>Here, the appropriate result measure in a program evaluation would relay directly on complementary services taken into the district as an effect of upgrading.</p> <p>Another example of importance of complementary programs is micro-credit programs, as, owners may not be in a situation to respond to increases in tenure security through housing investment if they are credit constrained[18, 19]</p> <p>. In these examples, the value of upgrading might depend on complimentary private or public interventions as, housing materials banks or micro-credit programs.</p>
Difficulties of assessment	<p>Good evaluation must detect not only the outcome of the program but also the exact substances of failure or success[20].</p>
Recommendations	<p>To do so, impact evaluations need to take care of all possibly vital complimentary facilities that would increase the value of the intervention.</p> <p>This is important both for evaluating benefits (as in the case of roads), and for identifying columns to project success.</p>

Such analysis can generally be done prospectively, based on careful consideration of estimated results[21].

However, assessment of these channels must then be merged into information collection efforts and participants' subjective assessment of project success.

3.2 Sustainability:

Importance of sustainability	Pre-project cost-benefit analyses depend on long-time cost recovery or welfare benefits.
Difficulties of assessment	When evaluations occur shortly after those projects are finished, it is very problematic to debate long-term effects.
Recommendations	<ul style="list-style-type: none"> - Evaluators should follow interventions at regular intervals at least five years after project completion. - To minimize costs of evaluation, evaluators should follow project participants one year and five years after project completion. - A good method to evaluate sustainability by making an analysis of project participation and implementation through variations in political rules and financial shockwaves, which can offer vital data about the probability those interventions, will be sustainable in the future[9].

3.3 Administrative costs:

Importance of administrative costs	Upgrading projects was unsuccessful several times in the past because unexpected charges of running the program. For example, a large materials loan program in Zimbabwe met administrative problems and costs, the loans had been kept small to avoid troubling families, but the results were normally inadequate to finance construction[22].
Difficulties of assessment	Many assessments did not succeed to track administrative problems and costs in follow-up studies and monitoring efforts, depending on pre-intervention estimates of management costs to assess the net effect of the program.
Recommendations	To avoid this sort of assessment mistake, and to detect difficulties with implementation that could be avoided in the future (as was the situation in Zimbabwe), evaluators should keep an eye on project implementation charges over time by talking to project managers and administrators through the project sequence.

3.4 Quality control:

Importance of quality control	When local experts are unavailable, construction quality can be assessed indirectly by asking households or community groups to report the amount and types of inputs used in construction, although this does not avoid the potential problem of imperfect recall and intentional misreporting in the case that corrupt project administrators skim project funds by skimping on materials.
Difficulties of assessment	Past assessments have confirmed that it is hard and expensive to control infrastructure quality. This confuses analyses of upgrading completion rates, as

	well as changes in housing values and attributes and investment motivations.
Recommendations	In the past, evaluators have often trusted self-reported information from households and project managers. More correct information could be gathered by engineers and architects to collect complete data on the quality of buildings, infrastructure and public investments.

3.5 Local participation:

Importance of local participation	This is an important characteristic of project design that has not been carefully inspected; it would be highly helpful for many poverty interventions to examine these hypotheses by setting a wisely planned experimental study.
Difficulties of assessment	It is unclear from past studies the extent to which successful project implementation relies on local participation.
Recommendations	Because interventions are most effective when ran by the municipal authority and implemented at the community level through a wide-ranging set of agencies including community-based organizations, NGO's, and UN agencies such as UNICEF and Habitat Evaluators can potentially shed light on that by designing evaluations that randomize the level of community participation and integration.

4 Conclusions

All programs should be subject to a “process evaluation” – that is, resource flows should be monitored, and there should be a very basic attempt to gather information on what did and did not go well with the program, in an attempt to learn lessons which can be applied to future work.

When we express slum upgrading evaluations in particular, more attention should be given to the wide range of results that can be monitored, particularly as there are many vital questions which past studies of slum upgrading projects have not been able to answer (as sustainability).

Subject's specific to urban situations, public goods, and implementation must be taken into consideration when planning evaluations of slum upgrading projects.

5 References

- [1] E. L. Glaeser, "Distort property values and urban growth," Harvard University 2011.
- [2] I. Imparato and J. Ruster, "Slum upgrading and participation: Lessons from Latin America," World Bank, Washington, D.C 2003.
- [3] *impact evaluation for slum upgrading interventions*. harvard: harvard university, 2008.

- [4] Skip Krige, Michael Schur, and G. Sippel, "The identification of towns in the Free State for an urban upgrading and development programme: a proposed method for consideration," *Development Southern Africa* vol. 15, pp. 361-377, 1998.
- [5] K. Coit, "Housing policy and slum upgrading in Ho Chi Minh City," *Habitat International* vol. 22, pp. 273-280, 1998.
- [6] O. Dundar, "Models of urban transformation: Informal housing in Ankara," *Cities*, vol. 18, pp. 391-401, 2001.
- [7] H. Werlin, "The Slum Upgrading Myth," *Urban Studies*, vol. 36, pp. 1523-1534, 1999.
- [8] G. D. Verma, "Indore's Habitat Improvement Project: Success or failure?," *Habitat International* vol. 24, pp. 91-117, 2000.
- [9] J. Lu, "Beijing's Old and Dilapidated Housing Renewal," *Cities*, vol. 14, pp. 59-69, 1997.
- [10] Abramson and D. Benjamin, "Marketization and Institutions in Chinese Inner-city Redevelopment: a Commentary of Lu Junhua's Beijing's Old and Dilapidated Housing Renewal," *Cities*, vol. 14, pp. 71-75, 1997.
- [11] V. Mukhija, "Upgrading Housing Settlements in Developing Countries: The Impact of Existing Physical Conditions," *Cities*, vol. 18, pp. 213-222, 2001.
- [12] V. Mukhija, "Enabling Slum Redevelopment in Mumbai: Policy Paradox in Practice," *Housing Studies* vol. 16, pp. 791-806, 2001.
- [13] L.W.Yun and K Yusof, "Services for urban poor families in Kuala Lumpur, Malaysia: A case study," *Child Welfare*, vol. 70, pp. 293-292, 1991.
- [14] Mudit Kapoor, Somik V.Lall, Matthias K.A.Lundberg, and Z. Shalizi., "Location and Welfare in Cities: Impact of Policy Interventions on the Urban Poor," Washington, D.C2004.
- [15] J. W. Schoorl, J. Van der Linden, and K. S. Yap, "Between Basti Dwellers and Bureaucrats: Lessons in Squatter Settlement Upgrading in Karachi," 1983.
- [16] OED, "Kenya - Development of Housing, Water Supply and Sanitation in Nairobi," World Bank, Washington, D.C1996.
- [17] Michael Bamberger, Bish Sanyal, and N. Valverde, "Evaluation of Sites and Services Projects: The Experience from Lusaka, Zambia," Washington, DC1982.
- [18] Douglas H Keare and S. Parris, "Evaluation of Shelter Programs for the Urban Poor: Principal Findings," World Bank, Washington, D.C. 1982.
- [19] Douglas H. Keare and S. Parris, "Evaluation of Shelter Programs for the Urban Poor: Principal Findings," Washington, D.C1982.
- [20] Abdul Quader Miah and K. E. Weber, "Feasible slum upgrading for Dhaka," *Habitat International* vol. 14, pp. 145-160, 1990.
- [21] A. Kumar, "Delivery and management of basic services to the urban poor: the role of the urban basic services, Delhi," *Community Development Journal*, vol. 26, pp. 50-60, 1991.
- [22] H. U. Bijlani, "Strategies for urban shelter: The improvement of slums, squatter settlements and sites-and-services," *Habitat International*, vol. 12, pp. 45-53, 1988.