

What is the evidence on what makes an effective urban planning framework for improved access to water, sanitation, and electricity services in low-income or informal settlements?

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Social Science Research Unit
Institute of Education
University of London

August 2014

PROTOCOL

The authors are part of Indian Institute of Technology Madras, India; Adani Institute of Infrastructure Management, India; and Harvard Kennedy School, Harvard University, USA and were supported by the Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre).

This protocol should be cited as: Thillairajan A., Mahalingam, A., Devkar, G.A., Benjamin, S., Rajan, S.C., and Deep, A. (2014) What is the evidence on what makes an effective urban planning framework for improved access to water, sanitation, and electricity services in low-income or informal settlements? Protocol. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.

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Contents

1. Background	1
2. Aim of the review	3
2.1 Policy background	3
2.2 Research background	4
2.3 Objectives and scope of the review	6
3. Methods used in the review	11
3.1 User involvement	11
3.2 Identifying and describing studies	11
3.4 Methods for synthesis	17
3.5 Studies and outcome variables for synthesis	21
3.6 Deriving conclusions and implications	21
4. Products.....	22
5. References.....	23
Appendices	27
Appendix 1: Authorship of this report	27
Appendix 2: Inclusion and exclusion criteria	29
Appendix 3: Journals to be handsearched	31
Appendix 4: Search strategy for electronic databases.....	32
Appendix 5: Coding and data extraction tool for studies that are shortlisted after screening based on inclusion and exclusion criteria	33
Appendix 6: Quality appraisal questions	38

1. Background

"If cities do not begin to deal more constructively with poverty, poverty may begin to deal more destructively with cities"

Robert McNamara, former President, World Bank

The rapid explosion of urban population is a prominent phenomenon observed in a large majority of the developing countries. There are numerous research papers and policy documents highlighting this changing urban dynamics in developing countries and its implications on policy making process of entire country. The United Nations Population Fund published a report titled "State of World Population 2007 - Unleashing the Potential Urban Growth" mentions that "*While the world's urban population grew very rapidly (from 220 million to 2.8 billion) over the 20th century, the next few decades will see an unprecedented scale of urban growth in the developing world.....By 2030, the towns and cities of the developing world will make up 80 per cent of urban humanity.*" (UNFPA 2007) This report also predicts that Asia and Africa will account for the largest urban population.

The rapid urbanization has resulted in many benefits such as economies of scale and agglomeration making urban areas attractive investment destinations, wider and diverse employment opportunities, blurring of social and cultural traditions, etc. However, there have been several unintended consequences this urbanization process, such as, overcrowding and congestion, increase in crime and violence, rise in inequality, absence of social and community bonding, and the incidence of urban poverty. In recent years, the phenomenon of "urban poverty" has emerged as one of the biggest challenges for national and sub national governments. The challenge is further compounded because of the multiple definitions and perceptions across countries, of what constitutes "urban" and "poverty".

Urban poverty has been described by the World Bank as a multidimensional phenomenon having challenges like 1) limited access to employment opportunities, 2) inadequate and insecure housing and services, 3) violent and unhealthy environments, 4) little or no social protection mechanisms, and 5) limited access to adequate health and education opportunities. A study conducted by Ravallion et al. (2007) has analysed data for 90 low and middle income countries. It found that an estimated one third of all urban residents are poor and it accounts for one quarter of the world's total poor. Baker and Lall (2003) indicate that incidence of poverty is higher in small cities and towns as compared to big cities (Baker 2008).

The urban poor face various challenges in their day to day life. Baker (2008) has observed following issues that are most commonly mentioned / discussed in the literature: 1) limited access to income and employment, 2) inadequate and insecure living conditions, 3) poor infrastructure and services, 4) vulnerability to risks such as natural disasters, environmental hazards and health risks, 5) spatial issues which inhibit mobility and transport, and 5) inequality closely linked to problems of exclusion. The prominent reasons behind these are: (i) Mismatch between official Master Planning and settlements of mostly poor groups designated as "slums"; and (ii) lack of availability of "infrastructure and services" in these slums.

What is the evidence on what makes an effective urban planning framework for improved access to water, sanitation, and electricity services in low-income or informal settlements? Protocol

The UN-HABITAT has been analyzing the urbanization phenomenon across the world and the analysis is presented in a form of yearly reports focusing on cities. The state of world's cities 2009/2010 has presented the global assessment of slums undertaken by the UN-HABITAT, which indicated that 828 million or 33 percent of the urban population of developing countries resides in slums. This large proportion of slum dwellers has brought intense focus on "eradication of slums" among leaders of both developed and developing countries. The criticality of eradication of slums is recognized by the United Nations under the Millennium Development Goal 7, Target 11. The target is "*By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers*" (MacPherson 2013).

As with the terms "urban" and "poor", the "slum" is defined and discussed from various perspectives. The definition of "slum household" by the UN-HABITAT broadly captures the concepts discussed in the literature; which is "A slum household is a household that lacks any one of the following five elements: 1) access to improve water (access to sufficient amount of water for family use, at an affordable price, available to household members without being subject to extreme effort, 2) 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); 3) Security of tenure: (evidence of documentation to prove secure tenure status or de facto or perceived protection from evictions), 4) durability of housing (permanent and adequate structure in non hazardous location), and 5) sufficient living area (not more than two people sharing the same room). There is also a literature which links 'slums' to the legal status of land - the non-recognition by some parts of the state of the real estate transaction associated with the alienation of land.

The lack of physical infrastructure like water supply, sanitation, waste collection, electricity, and street lighting severely affects the health, quality of life and social well being of slum dwellers. The impact of poor supporting infrastructure on the health of urban poor has been investigated by different agencies. The diseases common or prevalent in urban areas due to poor infrastructure are diarrhoea, malaria, cholera and respiratory diseases.

Various policy interventions like slum up gradation, slum rehabilitations and resettlement and so on are being adopted in various countries to improve housing conditions and delivery of urban services in slums. The results of these interventions has been varied and there is a need to investigate the evidence to understand the efficacy of various interventions and based on these observations, to design appropriate interventions for a particular situation.

2. Aim of the review

2.1 Policy background

The improvement of basic services in slums / informal settlements have been looked at from various perspectives. This can be observed from the policy and development interventions implemented by developmental organizations working on this area. The Cities Alliance, a global partnership between local authorities, national governments, non-governmental organizations, and multi lateral organizations, has developed a "Cities without Slums" action plan to improve the living conditions of slum residents - the world's most vulnerable and marginalized urban residents. The "Cities Alliance" supports "Citywide and Nationwide Slum Upgrading Programmes" that are undertaken in cooperation with residents, community groups, businesses as well as local and national authorities. The legalising or regularising of properties and bringing together secure land tenure to residents are one of the key elements of these slum upgrading programs.

The water and sanitation program (WSP), a multi donor partnership administered by the World Bank, seeks to support poor people in obtaining affordable, safe, and sustainable access to water and sanitation services. It has two focus areas: 1) supporting poor inclusive water supply and sanitation sector reform, and 2) targeting the urban poor and improving services in small towns. The first area aims to support national and sub national governments, and public and private service providers by developing pro-poor and pro-inclusive policies and models for improved water and sanitation services (WSS) in a dense urban and peri-urban areas and small towns, while the second area aims to provide evidence based knowledge for reforming outdated approaches and institutional arrangements for improved WSS.

Urban poverty and slum upgradation are two major areas of focus for the World Bank. The urban poverty practices covers aspects like assessment of urban poverty, making poverty alleviation strategies participatory and assessment of impact of these strategies. The slum upgradation practice has three components: infrastructure upgrading, social issues and linkages to services. The slum upgradation programs of the World Bank attempts to adopt either one or all of these components. For example, the slum up gradation programs in Jamaica and Brazil has combined the infrastructure upgrading for improved access to water, sewage, solid waste, electricity, roads, drainage and related to community infrastructure with social programs like micro finance, land tenure regularization, crime and violence prevention programs.

The country assessment report provides information about the outcomes of various interventions designed and implemented by the World Bank. For example, the "Mali: Country Assessment Report 2002" examines the slum upgrading programs and policies of Mali, with objectives to analyse what worked and what did not work in a particular situation, and identify ways in which interventions for improved service delivery to the poor can be better designed and targeted. The lessons learned from these slum upgrading programs are listed under three categories: 1) institutional framework, 2) urban upgrading and land legalization, and 3) financial aspects. The findings related to institutional framework indicated slowing down of the program owing to the absence of transparency in compiling the list of beneficiaries, in land management and distribution, lack of clarity on

What is the evidence on what makes an effective urban planning framework for improved access to water, sanitation, and electricity services in low-income or informal settlements? Protocol

the roles of governmental entities like the district, the municipalities, and the National Directorate of Property Tax in land management, and non transparent working of up gradation committee. The land speculation, changes in land use pattern, and non compliance to technical specification of infrastructure and services were key obstacles to slum up gradation program under the category of urban upgrading and land legalization. The financing challenges faced by the slum up gradation programs were insufficient financial support from national government and non payment for the land in order to obtain the letter of attribution by residents staying in the former squatter area (World Bank 2002).

The World Bank supported priority infrastructure investment project (PIIP) in Danang, Vietnam, which aimed to improve living conditions and productivity of low income residents through better access to basic services. The learnings from this project are property prices are likely to outstrip growth in income amongst poorest groups and increasing income inequality will manifest in the living conditions of poorer people, a variety of options for low income housing are necessary for fulfilment of needs like housing maintenance, and replacement housing units where current dwellings are clearly inadequate (World Bank 2007).

The UN-Habitat program has been active on the front of slum upgrading, by following a twin track approach: 1) improving the supply and affordability of services, and new housing opportunities to curb the growth and creation of slums, and 2) improve housing and quality of living conditions in existing slums. It has also launched a program named "Participatory Slum Upgrading Programme" that creates network of local and national stakeholders for meeting regional slum upgrading challenges.

The Department of International Development (DFID), Government of the UK has been carrying out work in the area of slum improvement and access to basic service for urban poor. For example, the projects undertaken in India are the Hyderabad Slum Improvement Project (HSIP), Calcutta Slum Improvement Project (CSIP), Kolkata Environmental Improvement Project (KEIP), Kolkata Urban Services for the Poor (KUSP), Andhra Pradesh Urban Services for the Poor (APUSP), Madhya Pradesh Urban Services for the Poor (MPUSP), and Support Programmes for Urban Reforms (SPUR).

The rising urban poverty is a serious concern for policy makers in the Government of India. The thought process towards solving the puzzle of urban poverty is taken up by the Government of India much more systematic way. The Ministry of Housing and Urban Poverty Alleviation has been realising study reports focusing on urban poverty. The "Inclusive Urban Planning: State of the Urban Poor Report" was released in 2013, covering diverse topics like inclusive growth, land use and management, urban planning, spatial illegality, inclusive transport, social exclusion, and tenure security. It has case study from different countries like Brazil, India, South Africa and Phillipines, The Indian case studies are from cities like Bangalore, Chennai, Indore and Jaipur (MoHUPA 2013).

2.2 Research background

The urban service delivery in slums or informal settlements has generated lot of curiosity among the research community and it led to investigation of this area from diverse perspectives. MacPherson (2013) has compared the effects on poverty of a participatory slum upgrading project with one that has been non participatory in Kenya. He has observed that the participatory programs are implemented on too small scale and face

numerous challenges and limitations, although, they do result in improvement for communities.

Duflo et al. (2012) have identified the barriers preventing improvements in water supply and sanitation services to the urban poor. These barriers are technical, bureaucratic, and legal constraints in building supply infrastructure, lower willingness to pay, presence of transient or migrant population and institutional constraints resulting from coordination between regional and local governments. Further, they have mentioned about following areas of future research: consumer's willingness to pay, coordination issues and collective action problems, secured property rights to slum dwellers, vote buying and accountability of elected representatives.

The effective public participation and involvement in urban planning and development on the community level has been investigated by Vraneski (2000). He indicates three basic model of community participation: "Top down" - through the initiative of the authority; 'Bottom Up' community initiative and with a 'Third Party' through initiatives of agents of change. Further, two strategies of community participation area suggested: those that lead to fast achievements and results on the one hand; and those leading to long - range products that influence civic culture and public policy, on the other hand.

Mahjabeen and Shrestha (2009) have analyzed community participation in the making of Sydney Metropolitan Strategy with Fairfield City Council. They have found that opportunity for diverse social groups to participate in the plan making process have seriously flaws and government officials along with powerful businesses have been controlling major decisions.

Auma (2012) has showcased application of participatory geographic information systems (PGIS) based methodology redevelopment framework in Zanzibar's planning process and it was found that framework to be effective in creating awareness, eliciting and ascertaining local spatial knowledge, reconciling different perceptions held on neighbourhood variables, visioning redevelopment constructs, policy formulation, and data retention for an anticipated informal neighbourhood redevelopment initiative.

Patel et al. (2011) argue that officers in government agencies are unable to rapidly structure and implement slum-improvement projects because they lack an effective slum-improvement-specific statutory framework within which to operate. They mentioned that the key to scaling-up—as the ambitious Rajiv AwasYojana in India proposes to do—is to institute a comprehensive statutory process enabling agencies to concurrently deal with technical, financial, organizational and tenure complexities.

The citizen participation is advocated based on ethical concerns and a moral purpose. The "right" of citizens to be involved in decision making process is a normative aspect of citizen participation. Asrnstein (1969) has discussed the increasing citizen power or control with the "ladder of citizen participation". The ladder comprised of three tiers: 1) First / Highest Tier depict the greatest degree of citizen power: partnership, delegated power and citizen control, 2) Second Tier depict varying degrees of tokenism: informing, consultation and placation, and 3) Third / lowest tier depicts "non participation" comprising of citizen manipulation and therapy.

Kingston (1998) has proposed six step ladder of public participation, in which level of participation increases from bottom to top. These six steps are: 1) public right to know: the public has only the possibility to be aware that some planning issue could be of interest, 2) Informing the public: the concerned local authority implements some action

plan in order to inform the people; but the people has no possibility to react, 3) public right to object: the city-dwellers may say yes or no to a project, but have no possibility to react neither to amend it, 4) Public participation in defining interests, actors and determining agenda, 5) Public participation in assessing consequences & recommending solutions: public is truly involved in analyzing the impacts of possible decisions and can recommend solutions which can be accepted to be implemented, and 6) Public participation in final decision: this is real participation in the final decision; the decision is not only made by elected officers (city-councillors for instance), but each citizen can vote whether or not to accept the plan.

Vindasisu (1974) proposed different types of public involvement mechanisms including informal local contacts, mass media, publications, surveys and questionnaires, workshops, advisory committees, public hearings, public meetings, public inquiry, special task forces and gaming simulation. He has analysed these mechanisms based on factors like focus in scope, focus in specificity, degree of two way communication, level of public activity required and agency staff time requirements. Chang (2009) suggests that the complicated nature of slums makes it necessary to use innovative collaborations in various slum development activities.

2.3 Objectives and scope of the review

2.3.1 Study domain

Sectors

This systematic review examines the evidence on what makes an effective urban planning framework in low income or informal settlements for delivery of basic services. Basic services generally includes access to water, sanitation, and energy. While our study would include water and sanitation, we propose to restrict the scope of study to only electricity under energy for the following reasons. Energy comprises of different sources such as cooking fuel (kerosene, cooking gas, etc.); electricity for heating, lighting, and operating lifestyle equipment; fuel for transportation, etc. In the interest of keeping the systematic review in focus, we propose to consider only electricity and exclude all other forms of energy from the systematic review. In addition, the decision to focus on electricity was also driven by the literature. Studies that have analysed energy services for the poor have invariably focused on electrification (for example, Baruah, 2010). Moreover, access to electricity provides a wide range of economic, social, and health benefits (Price, 2000; World Energy Assessment, 2000). Further, the benefits from access to electricity have been well identified with achievement of Millennium Development Goals (Flavin and Aeck, 2006; Ha and Porcaro, 2005).

Countries

The review would focus on evidence from low and middle income countries (LMICs), together referred as developing countries by the World Bank¹. The study was restricted to developing countries because of the substantial heterogeneity in context between developed and developing countries, which can limit the validity of the synthesis. While it is recognized that there is considerable heterogeneity even among the developing countries, we chose not to have limit the countries to be included in the review because of the widespread problems of slums and low-income informal settlements seen in these countries. For example the percentage of urban population living in slums in 2001 in

¹Source: <http://data.worldbank.org/about/country-and-lending-groups> accessed on 24 June, 2014; <http://data.worldbank.org/about/country-classifications>

developing countries was 43%, whereas the corresponding percentage for developed countries was only 6% (UN-Habitat, 2003). Therefore, the topic of this review is very relevant for the majority of the developing countries, and our strategy is to capture the diversity in context in terms of various moderator variables.

2.3.2 Interventions

The interventions for this review are the different urban planning frameworks for low-income or informal settlements in LMICs. The nature of the planning framework would be analysed on two dimensions: first on the basis of degree of inclusivity and second on the basis of the level of participation from the community. Inclusive urban planning is the one that takes into account the needs of the poor and formulates specific strategies to improve or redevelop slums in ways that make the poor better off. In general, top-down approach is less inclusive than bottom-up approach. If the framework is formal city level planning driven by the government, then it would be a top-down approach. On the other hand, if the approach is for micro-planning for individual slum improvements, then it would be classified as a bottom-up approach. In between these two extremes, there is a spectrum of approaches that involve varying levels of inclusivity. For example, the involvement of non-government organizations (NGOs), community based organizations (CBOs), and resident associations increase the element of inclusiveness in the planning process.

The second dimension involves the degree of participation by the community in the planning framework. Participatory planning refers to the involvement of different stakeholders like community residents, officials from government and other institutions like NGOs and CBOs in the intervention. Possible forms of community participation are as follows (adapted from UN-Habitat, 2003; Kingston, 1998):

- Passive participation: Poor communities participate by being told about initiatives that are being planned or have already been decided upon, without any attempt to elicit local opinion or knowledge.
- Participation through giving: Poor communities are asked about their needs through surveys or similar instruments. The information is used anonymously in the decision making process without feedback.
- Participation through consultation: Poor communities are consulted as to what should be done to improve the situation, but there is no obligation to take the residents' views into account.
- Participation through contribution: Poor communities are asked to provide labour or financial contributions towards the provision of services and the residents agree to take primary responsibility of well-defined components of the project.
- Participation through partnership: Poor communities and other key actors share resources, knowledge, and risks in pursuit of commonly agreed upon improvements. Partnership implies a long term, equitable relationship.
- Participation through self-mobilisation: Poor communities work together to demand and /or implement improvements in basic services. They develop contacts with experts, who will contribute with managerial and technical skills, but community groups retain control over how the resources are used.

In instances, where the involvement and participation is not clearly described in the studies, we would use various proxies found in the literature to estimate the level of participation. An important proxy for participation would be the land tenure. The link between tenure and access to basic services has been well studied (for example, Kranthi and Rao, 2009; EHP, 1999; Sjöstedt, 2011). Several studies have indicated that in slums where residents enjoy secure tenure to land and housing (either informal or informal), community-led slum improvement initiatives are much more likely to be undertaken (UN-Habitat, 2007). Security of tenure motivates the residents to improve their homes and neighbourhoods (World Bank, 2013).

A second proxy for participation would be the durability of housing in the slums and low-income settlements. UN-Habitat (2002) has recognized that durability of housing as one of the five key dimensions for improving slums. The indicator of durability of housing is the proportion of households which live in a house considered as "durable", i.e., built on a non-hazardous location and has a structure permanent and adequate enough to protect its inhabitants from rain, heat, cold, and humidity. Durability indicates a sense of permanency with reduced threat of eviction, motivating the residents to participate and contribute to the improvements of their locality.

We differentiate between inclusivity and participation because inclusive urban planning approach may or may not be participatory. (Examples include, Basic Services for Urban Poor (BSUP) programme implemented by Government of India). Similarly, high levels of participation do not guarantee higher degree of inclusivity. For this reason, these two dimensions would be captured separately when characterizing the nature of the planning framework.

2.3.3 Moderators

The outcomes are dependent on not just on the interventions, but on a lot of other variables. Together we call them as moderator variables. To facilitate analysis of these moderators, they were broadly classified in one of the three categories: context, content, and process (adapted from Pettigrew, 1987; Dawson, 1994; Nelson and Dowling, 1998). Context refers to the environment and the setting of the slums. Content refers to the elements of the intervention. Process refers to the actions, reactions and interactions of various interested parties in the implementation of the programs / planning framework.

While the spectrum of moderators that affect outcomes would become clearer during the synthesis phase, the initial searches and inputs from the advisory board indicated the relevance of the following factors in each of the categories:

- Context: Type of slum (declared or undeclared slum); Security of land tenure; and institutional form and structure; spatial location of the slum; etc.
- Content: Type of facility (for example in the case of water supply, is it a household connection to piped water; or it is a connection to public water outlet; or is it access to non-piped water such as open or bore wells); source and quantum of funding for the project
- Process: This includes implementation, maintenance, and operations of the facility

2.3.4 Outcomes

This review synthesizes the impact of the interventions on the level of access to particular services and facilities. Access is an important element in achieving the Millennium Development Goals (Global Urban Observatory, 2003) and is the outcome under

consideration in this review. While the traditional definitions of access would mean connectivity to the service, it has been indicated that in the context of improvement of slums, the indicators of access would be more broad-based and would include the following for the three sectors (UN-Habitat, 2002):

- Water supply: Proportion (or number) of households with access to improved water supply, availability at an affordable cost; at a sufficient quantity; and without excessive efforts and time
- Sanitation: Proportion (or number) of households with access to adequate sanitation facilities
- Electricity: Proportion (or number) of households with electricity connections; availability of electricity at an affordable cost; at specified voltages; and without excessive disruptions

In addition to the above, we are also keen to consider the following attributes of access depending on the availability of evidence:

- Durability of access: This seeks to explore whether the improvements in access is temporary or of a more permanent nature. While the definition of what is temporary or permanent is subjective and can differ between contexts, our objective is to check if the improvements are short-term or likely to be for a long-term.
- Sustainability of access: This dimension would analyse the attribute of environmental impact resulting from access.

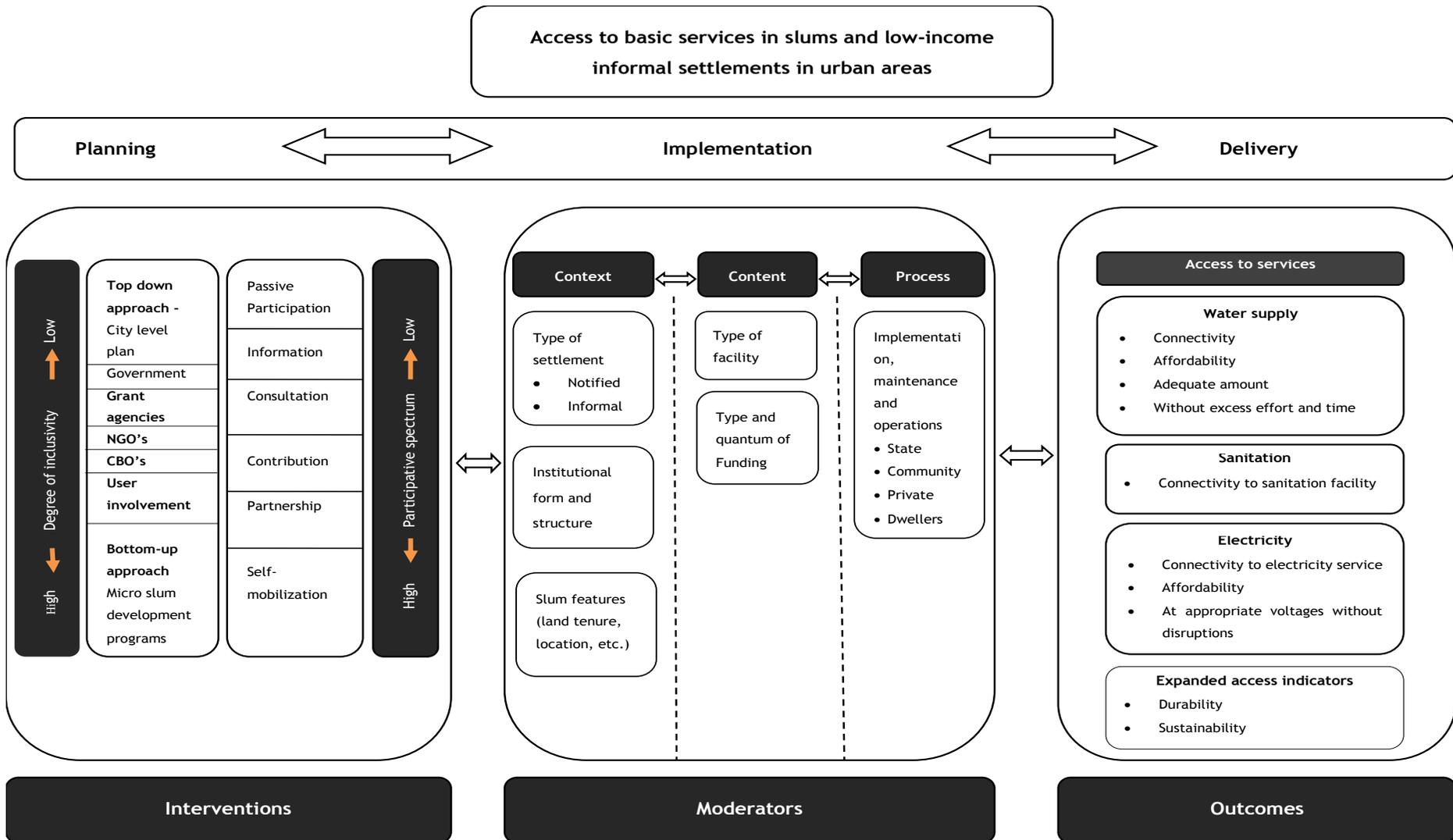
2.3.5 Research questions

The broad objective of the systematic review is to synthesize the evidence on what makes an effective urban planning framework for improved access to water, sanitation, and electricity services in low-income or informal settlements. Specifically, the review would attempt to answer the following questions:

- Which urban planning approaches are more effective in improving access to water supply, sanitation and electricity services in low-income or informal settlements in LMIC's?
- Under what circumstances do these approaches deliver better results? Why?
- What are the shortcomings and limitations of different urban planning approaches?

What is the evidence on what makes an effective urban planning framework for improved access to water, sanitation, and electricity services in low-income or informal settlements? Protocol

Figure 2.1: Rationale for the review



3. Methods used in the review

3.1 User involvement

The main users of this review would be policy makers as well as the funding and development agencies such as DFID. To understand the imperative of policy makers and increase the relevance of this review, we would be involving the users at four levels.

- First would be extensive discussions with the funding agency. It is proposed to have discussions with the policy team of DFID to update on the progress of the study and incorporate any suggestions that they might have.
- Second, a policy advisory board has been constituted with members from the government involved in policy making, a civil society organisation, and the private sector. The inputs from the advisory board have been taken in developing the conceptual framework and objectives for the study. The policy advisory team also reviewed the study protocol and would also review the draft report of the study.
- Third, an academic advisory board has been constituted to complement the inputs received from the policy advisory board. The academic advisory board would provide inputs on the study design, and also point to relevant sources that can be included in the systematic review.
- Fourth, the study review co-ordinating agency, EPPI, would also help in arranging the review of the protocol and the draft of the report.

It is thus felt that having user involvement at multiple levels would help to provide a review that is more appropriate to the end users. Details of the advisory board are given in Appendix 1 on the authorship of the report.

3.1.2 Users of the review

The main users of the report would be: (i) policy makers, specifically from the city planning agencies. The findings of the study would give insights on designing more effective urban programs. (ii) funding and development agencies such as DFID, that supports urban programs in various parts of the world. The findings of this study would help in designing urban support programs that yield better results on the ground.

3.2 Identifying and describing studies

3.2.1 Defining relevant studies: inclusion and exclusion criteria

Only studies that satisfy all the inclusion and exclusion criteria listed in Appendix 2 will be included in the review.

- Context of the study: Only studies that are based on data from LMICs or developing countries (as mentioned in section 2.4.1) will be considered. Broadly, the review would cover studies based on data from African countries; Latin American countries belonging to parts of South and Central America; Asian

What is the evidence on what makes an effective urban planning framework for improved access to water, sanitation, and electricity services in low-income or informal settlements? Protocol

- countries excluding Japan and the Four Asian Tigers (Hong Kong, Singapore, South Korea and Taiwan); and the transition and emerging economies in Eastern Europe and Central and East Asia. By restricting the domain of the study to developing countries, we are minimizing the contextual heterogeneity. In addition, the study should focus on slums and low income informal settlements in urban areas.
- Domain: The study would comprise the following segments of basic services: water, sanitation, and electricity services. While there are other basic services too, this review would focus only on the above three Infrastructure segments.
- Outcomes: Studies that analyse the impact on access to water, sanitation, and electricity services.
- Study year: Published or completed during 1999 - 2013. The fifteen year period was chosen so that we get adequate number of studies and also to focus on the most recent evidence. While there are merits in not imposing a time restriction on searches, the older studies are likely to have less applicability to current situations especially with regard to the policy front.
- Type of studies: The systematic review would focus on all types of primary studies. Our initial database searches have yielded mostly observational studies that include both quantitative and qualitative studies. The former group of studies provide a stronger link between outcome and intervention. However, they do not necessarily highlight the causal chain. In addition, these studies do not capture the richness of the context adequately. Therefore, to complement the robustness of quantitative studies we will include qualitative studies as well since they capture the contextual differences and causal chain for evidence in a better manner.

Exclusion criteria:

- Studies that are not published in English would not be considered for the review. We will only include studies that have been published or translated to English. As most of the relevant research is in English, we believe that the studies obtained through our search will be comprehensive.
- Studies that are only based on data from developed countries or those that do not distinguish developed and developing countries in the analysis.
- Studies that do not measure the impact on access to the basic infrastructure services.
- Studies that have been done or published before 1999.
- Studies that are reviews of existing studies.

Appendix 2 summarizes the inclusion and exclusion criteria and provides examples of studies that would be included and excluded for this review.

3.2.2 Identification of potential studies: Search strategy

Our initial search strategy will be to search through several electronic bibliographic databases using appropriate search phrases. All searches would be recorded systematically, without selecting or marking any results. Search results will be grouped by the sources through which they were identified (with keyword/topic combinations listed), and listed with bibliographic information and abstracts (where applicable). The search strategy for identifying the studies for inclusion in the review would be as follows:

- Hand-searching of key journals: The journals that publish research extensively in urban planning and development were identified and all the publications in these journals would be manually assessed for inclusion in the review. The journals identified and the number of hits in these journals is listed in Appendix 3. This ensured that studies that were published in the most relevant journals in the area were not missed.
- Bibliographic databases: The search processes include searching for studies in the electronic bibliographic databases. The initial results on the databases searched, the search phrases used and the number of hits in different databases are given in Appendix 4. Wild card characters (*) were used to capture the possible variations in the search terms, to get the maximum number of hits.
- Websites: Websites that would have various unpublished studies and reports in the domain and context of the review would also be searched for potential studies. The list of the specific websites that are proposed to be searched is provided in Appendix 4.
- Citation searches of key authors who have researched on this topic.
- Reference lists in the papers that qualify for inclusion would also be examined for other studies for inclusion in the review.
- In addition to the above, depending upon the results obtained from the above search process, we would consider using Google Scholar to search for potential studies.
- Reaching out to our personal network to identify any recent studies that we might have missed.

EPPI-Reviewer software would be used to manage the search results found during the process.

3.2.3 Screening studies: applying inclusion and exclusion criteria

After identifying the potential studies from the different sources, each study would go through the inclusion and exclusion criteria at successive stages before its inclusion in the review. The steps for screening of the studies include:

- Title screening: The first step would involve a quick screening of the title of the article in order to establish its relevance for review. Studies not found suitable at this stage would be excluded from further evaluation. Abstracts would be

reviewed for those studies on which a decision cannot be made based on a review of the title.

- **Abstract screening:** Abstract of studies that would be shortlisted after title screening would then be reviewed to determine their suitability for this study. The article would not be considered any further if the abstract was found to be unsuitable. Full documents and articles would be reviewed for those studies on which a decision cannot be made based on a review of the abstract.
- **Full documents screening:** Full papers or reports will be obtained only for those studies that were shortlisted after title and abstract screening. The inclusion and exclusion criteria will again be applied to the full reports and those that do not meet these criteria will be excluded from the review. Studies that qualify for inclusion based on the review of the complete report would then be appraised for quality (see below) to determine their inclusion for the review.

3.2.4 Characterising included studies

As indicated by DFID (2014), it is felt that our searches would yield studies that have used different research designs (experimental, quasi-experimental and observational studies), cover the three sectors (water supply, sanitation, and electricity) and come from different regions (Asia, Africa, South America, etc.)

Our preliminary analysis indicates that most of the studies are observational in nature that includes qualitative (case studies) and quantitative (cross sectional or longitudinal studies), among which the former are more common.

While it would be ideal to have studies that also examine the causal links between the interventions and outcomes, in our experience, not all studies have focused on links in the causal chain. However, it is felt that most qualitative studies would capture the context of analysis in-depth and bring out clearly the linkages in the causal chain. Therefore, our evidence base would include both quantitative as well as qualitative studies that satisfy the quality appraisal criteria (Appendix 6).

3.3 Quality appraisal of studies

3.3.1 Identifying and describing studies: quality assurance process

Two members of the review team, working independently, would evaluate and select the studies for inclusion. The pairs of members, who would be using a suitable appraisal tool and coding procedure (explained below), would then compare their evaluations and come to a consensus on those studies that would be included for the review. In order to ensure consistency, the team would go through an internal moderation phase where both members would screen the same citations and compare differences in judgements.

In case where a consensus cannot be reached, a third member of the review team will review the study. The decision would then be taken based on a simple majority, i.e., if two members agree that the study should be included then it would be included. Alternatively, if two members feel that the study would not be appropriate for inclusion, then it would not be included. Through this process, the team will come to a shared understanding of the review and if necessary, the inclusion criteria can be suitably amended.

3.3.2 Assessing quality of studies

The quality of the studies would be appraised using a suitable tool, which would be finalized at a later stage based on the shortlisted studies. As a starting point, we propose an appraisal tool adapted from DFID (2014), Spencer et al. (2003), and Sandelowski and Barasso (2002). The tool is based on the following principles:

- **Conceptual framing:** Whether the studies acknowledge existing research or theory and make clear how their analysis fits within the context of existing work. High quality studies construct a conceptual or theoretical framework, indicating their major assumptions.
- **Transparency:** Whether the studies provide information on the data that has been gathered or the source of data. Studies should also include information about who has funded the study and if there is any potential conflict of interest.
- **Appropriateness:** This involves an appraisal of the appropriateness of the research design for the study conducted. There are three main types of research design: experimental, quasi-experimental, and observational (qualitative and quantitative).
- **Cultural sensitivity:** The studies should consider local and cultural factors that might affect any behaviours and trends observed in the study.
- **Validity:** Four principal types of validity are indicated:
 - **Measurement validity:** Need to assess whether the specific indicator chosen to measure a concept is well suited for measuring it.
 - **Internal validity:** Is the research design and method appropriate to determine the cause and effect linkages? Does it minimise the possibility of confounding variables affecting the dependent variable?
 - **External validity:** Describes the extent of generalisability of the findings of the study.
 - **Ecological validity / Reflexivity:** Relates to the degree to which the research is able to capture or accurately represent the real world, without the research itself somehow impacting upon the subjects it seeks to study. High quality studies in this dimension would consider how far the research findings may have been biased by the activity.
- **Sample:** Has the sample design and target selection of cases been defended and explained clearly?
- **Reliability:** Three types of reliability would be considered:

What is the evidence on what makes an effective urban planning framework for improved access to water, sanitation, and electricity services in low-income or informal settlements? Protocol

- Stability: This pertains to the dimension of collecting data. High quality studies would ensure that researchers are consistent in the way they ask questions and gather data.
- Internal reliability: Since concepts (or outcomes) can be measured using multiple indicators, studies need to ensure that there are not significant discrepancies between indicators. High quality studies would ensure that the indicators are appropriate to the cultural context in which they are taken.
- Analytical reliability: Whether results are consistent with the application of a different analytical technique to the same set of data?
- Analysis: High quality studies would convey the methods and formulation of analysis clearly. The studies would also be assessed on how well they have captured the depth and complexity of data in the analysis.
- Cogency: Is there a clear, logical thread that runs through the study? There should be a link between the conceptual framework, data, analysis, and conclusions. A cogent study would also identify the limitations of the study and also explore alternative interpretations of the analysis.
- Auditability: Whether the studies have clearly documented the overall research process.

The studies would be appraised using the above quality criteria. The study would be rated for quality on each of the dimension as given in Table 3.1.

Table 3.1: Quality appraisal of studies

Rating	Description
High	Comprehensively addresses multiple principles of quality
Moderate	Some deficiencies in attention to principles of quality
Low	Major deficiencies in attention to principles of quality
Cant' tell	When it is not possible to comment on the criteria based on the information given in the study

Studies that receive a low overall quality rating (Question 11 in the coding tool given in Appendix 6) would only be included in the review if we do not find adequate number of studies that have been assessed as high or medium quality. When we include such studies, the use of such studies would be clearly highlighted. The results of the quality appraisal would also be used to summarise the body of the evidence.

3.3.3 Summarising the body of evidence

In addition to the synthesis (given below), the body of evidence would be summarised on the following main characteristics (DFID, 2014):

- The quality of studies constituting the body of evidence
- The size of the body of evidence
- The context in which the evidence is set
- The consistency of the findings produced by studies constituting the body of evidence.

3.4 Methods for synthesis

3.4.1 Overall approach to synthesis

Since the studies selected for the review would be qualitative, quantitative, or mixed methods studies, we would use a mixed methods review approach for this study. It has been indicated that the interest in the use of mixed methods review is growing, since appraising studies that use different methods allows obtaining in-depth answers to complex research questions (Pace et al., 2012). Mixed methods review combines the strengths of qualitative and quantitative methods by integrating the in-depth descriptions of complex phenomena by qualitative methods with the statistical generalizability of quantitative methods (Pace et al., 2012).

There have also been other arguments for the use of mixed methods review. Campbell and Fiske (1959) have indicated that using multiple methods could enhance confidence in the findings, in particular by increasing the ability to evaluate convergent validity. Bryman (2001) indicates that multi method research compensates the weaknesses of any single research design. Greene et al. (1989) suggest the following rationale for the use of mixed methods research:

- To achieve convergence of results
- To identify overlapping facets that emerge on closer inspection using multiple methods
- To identify and examine contradictions obtained from multiple sources

Harden (2010) feels that the diverse forms of evidence that is used for synthesis in a mixed methods review increases the relevance of systematic reviews for decision makers. The mixed methods review helps to answer a number of questions in the same systematic review. It also helps to preserve the integrity of the findings of the different types of studies as it uses complementary frameworks for both qualitative and quantitative research (Oliver, 2005).

The synthesis framework would be similar to the one adopted by Thomas et al. (2004) and Harden (2010). After assessing the studies for quality according to the type of study, the first level of synthesis would be done using methods appropriate for the study (Fig 3.1). In the second level, we would integrate the findings from the first level synthesis.

3.4.2 First level synthesis

All studies selected for inclusion in the review will be coded and data extracted using the combined coding and data extraction tool (Appendix 5). This would then be used to prepare the statistical synthesis, meta-analysis, or the thematic synthesis, depending on

the type of study. The coding of the studies would facilitate a common understanding among all the members as well as the learning that can be gleaned from them for inclusion in the textual narrative.

There would be two types of synthesis based on the methods used in the studies.

Evidences from quantitative studies would be synthesized using appropriate statistical techniques. Where possible, the effect sizes or data which reflect the magnitude of the effect of the intervention (e.g. odds ratio, mean gain difference differences), sample sizes, p-value, standard deviation and/or standard error will be recorded for outcomes reported in each study.

Meta-analysis for outcomes will be performed using EPPI-Reviewer, when there were a sufficient number of studies that employed comparable designs and reported conceptually similar outcome measures. Statistical heterogeneity will be assessed using the chi-squared test, with a p-value greater than 0.10 indicating significant heterogeneity. A forest plot will be used to present the estimated summary of effect. In case, meta-analysis or effect size is not possible, we propose to use numerical narrative synthesis. In such a numerical narrative synthesis, results would be organised in terms of the direction and sizes of effect and/or statistical significance. The results can then be interpreted as 'positive' - whether the intervention resulted in favourable outcome or 'negative' - the intervention did not produce desired outcome.

The evidence from qualitative studies would be synthesized using a thematic narrative synthesis. The thematic synthesis helps to synthesize the evidence based on the identification of major / recurrent themes in literature and summarize the findings of primary studies under these thematic headings (Dixon-woods et al., 2004). The narrative description in the thematic synthesis makes the context of the study clearer, highlights the heterogeneity between studies, and helps to capture the strength of the evidence available (Barnett-Page and Thomas, 2009).

Three stages would be followed for conducting thematic synthesis of qualitative studies, as described by Thomas and Harden (2008): 1) Coding of text 'line by line', 2) development of descriptive themes and 3) generation of 'analytical themes'.

The first two stages involve examining the qualitative studies and coding each line of relevant text from qualitative studies according to its meaning and content. The software programs like EPPI Reviewer or NVivo would be effectively used for this task. The coding process would result into generation of new codes across different qualitative studies and /or renaming of existing codes. It could be relatively iterative process of 'axial coding' as termed in the grounded theory (Barnett-Page and Thomas, 2009). Before completion of these two stages, the codes and related text would be examined to ensure consistency of interpretation. The coding process could result into tree structure with the combination of main codes / themes and sub codes / themes.

The third step focuses on 'third order interpretations'; this involves development of analytical themes based on judgement and insights of the reviewers. The systematic review question provides guidance for development of analytical themes, which could be developed first by each reviewer and then followed by group of reviewers. These analytical themes would generate new interpretive constructs, explanations or hypothesis.

3.4.3 Second level synthesis

The second level synthesis would integrate the findings from the two first level syntheses. The findings of the statistical synthesis would be corroborated with that of the thematic synthesis and vice versa to arrive at an integrated description of the findings.

In addition, we would like to explore the possibility of undertaking the synthesis of all the studies included in the review using the Qualitative Comparative Analysis (QCA) technique. The QCA is appropriate for this study given the impact of various mediating factors on the outcomes. Originally proposed by Ragin (1987), QCA is based on the view that the same outcome may be achieved by different combinations of conditions, and that causation must be understood in terms of necessary and sufficient conditions. The approach was suggested as a means of analysing complex causal connections using Boolean logic to explain pathways to a particular outcome. Dixon-Woods (2004) indicates that QCA helps in causality determination. The strengths of this approach is the transparency in analysis, ability to incorporate both qualitative and quantitative primary study evidence, systematic in terms of approach, and allows completing explanations to be explored and retained. While the initial QCA methods involved coding of data in a binary format, recent refinements have included the introduction of fuzzy logic, so that it is not necessary to dichotomise the variables (Ragin, 2000).

Qualitative comparative analysis (QCA) would be used to augment the other synthesis performed as part of the study. To this effect we would use QCA to systematically understand what combinations of the interventions and moderator variables cause a desired outcome. The use of QCA would help us understand the multiple combinations/pathways (if present) that can lead a particular outcome. To this end, each outcome would be analysed separately and the causal combinations for the various outcomes would be contrasted and compared with each other to generate insights into patterns of interventions and moderators which seem to affect various outcomes greatly.

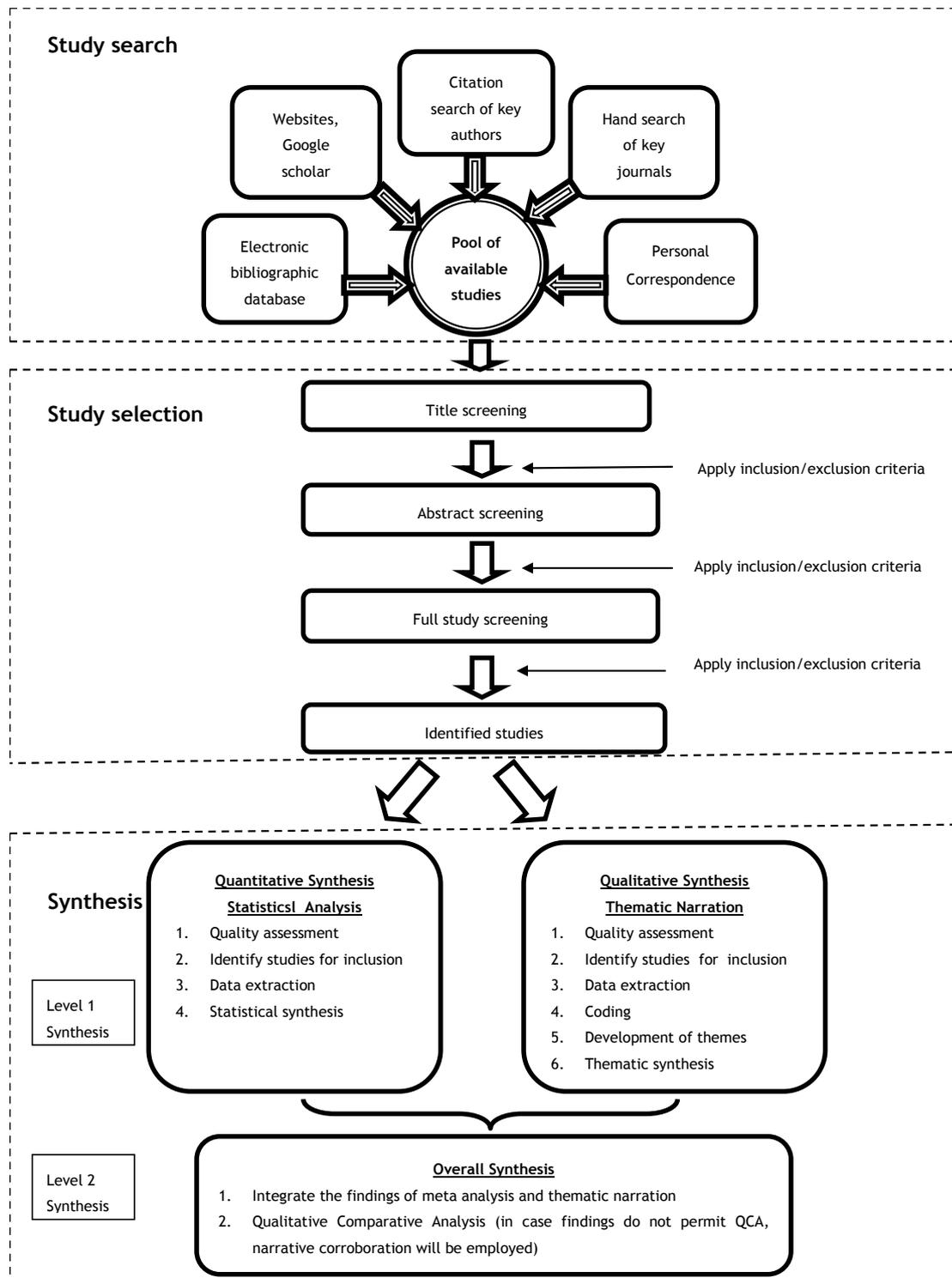
To enable this analysis, the various articles (cases) to be reviewed would form the data points for the QCA analysis. The interventions, the moderator variables as well as the outcomes for each of the data points would be modelled as fuzzy sets. Initially a coding scheme would be developed to calibrate the membership in fuzzy sets related to the various variables and outcomes for each data points. The cases would then be coded based on this coding scheme to serve as dataset for the QCA analysis. The thematic and meta analyses performed earlier would inform the choice of moderator variables to be considered for the QCA.

Given the number of variables that can impact the outcomes defined in this study, the QCA technique helps to identify a set of variables that represents a parsimonious and logically consistent model of the combination of variables associated with the identified outcome, i.e., access to basic services (Dixon-Woods, 2004). This would help in strengthening the causal pathway between interventions and outcomes.

3.4.4 Synthesis summary

In essence, this review would have three syntheses, each complementing the other. The meta analysis or the statistical synthesis of quantitative evidences would help in identifying the impact of intervention on the outcome. The thematic narrative synthesis of qualitative evidences would help to describe the prominent themes that can be identified in the literature. The third overall synthesis helps to integrate and corroborate the evidences in these two synthesis.

Figure 3.1: Overview of the study design and synthesis approach



3.5 Studies and outcome variables for synthesis

3.5.1 Selection of studies for synthesis

At this stage it is envisaged that all the studies that qualify for the review would be included in the synthesis. There would be no further selection of studies from those that meet the exclusion, inclusion and quality assurance criteria.

3.5.2 Selection of outcome variables for synthesis

The outcome variable for this review is access to basic services such as water supply, sanitation, and electricity. Our preliminary investigation indicated that the most common variables used to measure the access has been either the percentage of households connected to water supply, sanitation, or electricity services (for example, Akbar et al., 2007) or the number of number of households having access to the above services (for example, Tukahirwa et al., 2011). However, our study would consider for synthesis all the variables used in the list of included studies for the review.

3.6 Deriving conclusions and implications

The conclusions and implications would be derived directly from the synthesis of the findings in the studies included in the review. The team would first discuss among themselves the conclusions that emerge from the review. Such conclusions would then be substantiated in the light of the findings in the existing literature by a process of analytical generalization (Yin, 1984). In addition, the findings would also be discussed with the study advisory boards before the draft report is sent to DFID for peer review.

4. Products

4.1 Outputs

- Protocol
- Final report
- 4 page evidence brief

4.2 Timetable

Table 4.1: Deliverables and timetable

Submission of protocol	May 31, 2014
Submission of draft report	November 30, 2014
Submission of final report (subject to timely review comments)	March 31, 2015

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Appendices

Appendix 1: Authorship of this report

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Conflicts of interest (if any)

The authors are not aware of any conflict of interest, financial or otherwise, that may influence the objectivity of this review.

What is the evidence on what makes an effective urban planning framework for improved access to water, sanitation, and electricity services in low-income or informal settlements? Protocol

Acknowledgements

Financial support from Department for International Development, Government of UK is gratefully acknowledged. We also thank the feedback and suggestions for improvement from Kelly Dickson, Institute of Education, and the DFID policy team.

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Appendix 2: Inclusion and exclusion criteria

Inclusion criteria:

- Studies that use data from slums and low income informal settlements in urban areas in low-income and middle-income countries
- Domain: Basic services comprising of electricity; water supply; and sanitation
- Studies that examine the linkage between urban planning for basic services in slums and low income settlements and the impact on access to these services in the population
- Study year: Published or completed during the 15 year period 1999 - 2013
- Type of studies: Qualitative studies as well as Quantitative and empirical studies

Exclusion criteria:

- Studies that are not published in English
- Studies that are based only on the experiences of developed countries or those that do not distinguish between developed and developing countries in the analysis
- Studies that have analyzed the effect of various mediating factors on access to the identified services, but have not specifically considered the different attributes of planning in the provision of these services.
- Studies that have measured outcomes other than access, such as quality, cost, etc.
- Studies that have been done or published before 1999
- Studies that are reviews of existing studies

Examples of studies to be included:

Tukahirwa et al., 2011. In this study, the authors investigate the access of the urban poor to sanitation and solid waste services provided by non-governmental organizations (NGO) and community based organizations (CBO) and estimate the determinants of access to these services. Data from a sample of 337 households from 12 poor informal settlements in Kampala were used for analysis. The results showed that social proximity strongly explains the access of the poor to NGO and CBO provided sanitation services. The results contribute to the understanding of how urban poor access to NGO / CBO services can be improved.

Baruah, 2010. In this study, the author investigated the experiences of two NGO's of participating in a multiple-stakeholder pro-poor electrification program. It was found that NGO's can play a very effective role in slum electrification as intermediaries between CBO's, municipalities, and utilities. The study indicated that the NGO's can assist in

What is the evidence on what makes an effective urban planning framework for improved access to water, sanitation, and electricity services in low-income or informal settlements? Protocol

improving access by developing innovative ways of addressing land tenure issues; devising equitable ways of paying for electricity; improving business processes; dealing with non-payment and theft, etc.

Kranthi and Rao, 2009. This study looks at understanding the link between tenure security and the access to urban basic services in slums. The data was collected from a sample of households in three slums in Hyderabad, which had varying levels of tenure security. It was found that the average percent of households having access to basic services increased with increase in the degree of tenure security. This paper looks at the evidence between tenure security and access to basic services and since we have considered tenure as an indicator of participation, this study can be included for the review.

Sjöstedt, 2011. In this study, the author studies the impact of land tenure on water coverage levels in informal settlements in Botswana and Zambia. Both the countries had contrasting practices with respect to land tenure. Botswana refrained from forced evictions and tenure issues were clearly specified in law. In the case of Zambia, the land tenure was comparatively insecure. Regression analysis showed that variables representing land tenure accounted for around 74% of the variation in water coverage levels and the conclusion was that secure land tenure affected water coverage levels. Since land tenure is taken as an indicator of participation of the dwellers in the slum and informal settlements, this study can be included for the review.

Examples of studies to be excluded:

Akbar et al., 2007. This study analyses the role of community and institutional supply of potable water to urban poor using the city of Dhaka as a case study. The study proposes a model of Community Mixed Water Supply Model for providing water supply to informal and low income settlements in Dhaka. While the subject of the paper is directly related to the topic of this review, there is no evidence presented in the study. The model proposed is conceptual and the impact of the intervention is not discussed.

Prajapati et al., 2011. This study analysed the availability of basic services in the slums of the city of Bhuj, in Gujarat state. Survey data obtained from 109 households was used for analysis. The study found that access to basic services was poor - only 5.5% of the households had water line connection; none of the houses had sewage connectivity; only 58.7% of the households had electricity connection; and 60% of the houses did not have toilet facility. While the study highlights the poor access to basic services in slums, the findings do not state anything new that is not already known. The study is more of a status report and does not analyse the impact of any interventions.

Appendix 3: Journals to be handsearched

Table A1 summarizes the results of the articles that were assessed from the hand search process.

Table A1: Hits from hand search journals

S. No.	Journal(1999 - 2013)	Publisher	No. of articles
1.	World Development	Elsevier	2023
2.	Int. Journal of Urban and Regional Research	Wiley-Blackwell	1235
3.	Urban Studies	Sage publication	2157
4.	Environment and Urbanization (inc. their Asia edition)	Sage publication	519
5.	Environment and Planning (all series, A, B, C, D)	Pion	2884
6.	Cities	Elsevier	902
7.	Review of Urban & Regional Development Studies	Wiley-Blackwell	203
8.	Geoforum	Elsevier	1330
9.	Progress in Planning	Elsevier	148
10.	Utilities policy	Elsevier	397
11.	Water policy	IWA (International Water Association)	709
12.	Energy policy	Elsevier	4000
	Total		16507

Appendix 4: Search strategy for electronic databases

The following resources would be used to search studies for inclusion in the review

Electronic databases: EBSCO, ScienceDirect, WileyOnline, JSTOR, SSRN, Proquest, Emerald, SpringerLink

Websites: World Bank, Asian Development Bank, African Development Bank, Inter American Development Bank, DFID, UN-Habitat

Search criteria: Publication date: 1999 or later

Search keywords: The study is concerned with effective urban planning framework for access to basic services in slums and low income and informal settlements areas in developing countries. The search phrase was formulated in such a way so that it covered all the key words - slums and the three sectors, viz., water supply, sanitation, and electricity. Wildcard characters (*) and Boolean operators were used in the search phrase to capture as many relevant articles as possible. The initial search was done in the electronic databases. Since a full article search resulted in a large number of hits, the search was restricted to the title fields and abstracts of articles. Table A2 the number of hits obtained from the electronic databases. Since EPPI reviewer software is being used in the search management process, the hits obtained from the electronic databases would be exported to EPPI reviewer and then screened for inclusion in the review.

Table A2: Hits from database searches

Database	Search phrase used	Subjects	Fields Searched	Hits
Wiley Online Library	(slum*) AND (water OR sanitation OR electricity)	<ul style="list-style-type: none"> • Business, Economics, Finance & Accounting • Social & Behavioral Science 	Abstract	91
ProQuest	(slum*) AND (water OR sanitation OR electricity)	<ul style="list-style-type: none"> • All covered in the database 	All fields	1962
Science Direct	(slum*) AND (water OR sanitation OR electricity)	<ul style="list-style-type: none"> • Arts and Humanities • Economics, Econometrics and Finance • Social Science 	Abstract	31
Emerald	(slum*) AND (water OR sanitation OR electricity)	<ul style="list-style-type: none"> • All covered in the database 	Abstract	311
EBSCO	(slum*) AND (water OR sanitation OR electricity)	<ul style="list-style-type: none"> • All covered in the database 	Abstract	36
Springer Link	(slum*) AND (water OR sanitation OR electricity)	<ul style="list-style-type: none"> • Social Science • Economics • Energy • Business& Management 	All fields	2115
SSRN	(slum*) AND (water OR sanitation OR electricity)	<ul style="list-style-type: none"> • All covered in the database 	All fields	5
JStor	("slums") AND ("water" OR "sanitation" OR "electricity")	<ul style="list-style-type: none"> • Economics • Urban Studies 	Full-text	77
Total				4628

Appendix 5: Coding and data extraction tool for studies that are shortlisted after screening based on inclusion and exclusion criteria

Section I: Study Aims and Rationale

		Tick Relevant	Details
1	<p>What are the broad aims of the study?</p> <p><i>(Please write in authors' description if there is one. Elaborate if necessary, but indicate which aspects are reviewers' interpretations. Other, more specific questions about the research questions and hypotheses are asked later.)</i></p>	<input type="checkbox"/> Explicitly stated <input type="checkbox"/> Implicit <input type="checkbox"/> Not Stated/ Unclear	
2	<p>Was the study informed by, or linked to, an existing body of empirical and/or theoretical research?</p> <p><i>(Please write in authors' description if there is one. Elaborate if necessary, but indicate which aspects is reviewers' interpretation.)</i></p>	<input type="checkbox"/> Explicitly stated <input type="checkbox"/> Implicit <input type="checkbox"/> Not Stated/ Unclear	
3	<p>Do authors report how the study was funded?</p>	<input type="checkbox"/> Explicitly stated <input type="checkbox"/> Implicit <input type="checkbox"/> Not Stated/ Unclear	
4	<p>When was the study carried out?</p> <p><i>(State the year the authors have stated. If not, give a 'not later than' date by looking for a date of first submission to the journal, or for clues like the publication dates of other reports from the study.)</i></p>	<input type="checkbox"/> Explicitly stated <input type="checkbox"/> Implicit <input type="checkbox"/> Not Stated/ Unclear	
5	<p>What are the study research questions and/or hypotheses?</p> <p><i>(Research questions or hypotheses operationalise the aims of the study. Please write in authors' description if there is one. Elaborate if necessary, but indicate which aspects are reviewers' interpretations.)</i></p>	<input type="checkbox"/> Explicitly stated <input type="checkbox"/> Implicit <input type="checkbox"/> Not Stated/ Unclear	

Section II: Study Identification

		Tick and give details where relevant	
6	<p>Identification of report (or reports)</p>	<input type="checkbox"/> Website citation <input type="checkbox"/> Contact <input type="checkbox"/> Hand search <input type="checkbox"/> Electronic database	

What is the evidence on what makes an effective urban planning framework for improved access to water, sanitation, and electricity services in low-income or informal settlements? Protocol

		<input type="checkbox"/> Unknown	
7	Status	<input type="checkbox"/> Published <input type="checkbox"/> In press <input type="checkbox"/> Unpublished <input type="checkbox"/> Not known	
8	Linked reports	<input type="checkbox"/> Not linked <input type="checkbox"/> Linked <input type="checkbox"/> Not known	
9	Region in which the study was carried out (tick if more than one, as appropriate)	<input type="checkbox"/> South America <input type="checkbox"/> Africa <input type="checkbox"/> Asia <input type="checkbox"/> Europe <input type="checkbox"/> Central and North America (including Caribbean) <input type="checkbox"/> Others/ Not Stated	
10	Sector coverage	<input type="checkbox"/> Electricity <input type="checkbox"/> Sanitation <input type="checkbox"/> Water supply	
11	Main assumptions of the study		

Section III: Intervention description in the study

		Tick Relevant	Details
12	Type of urban planning framework	<input type="checkbox"/> Top down <input type="checkbox"/> Bottom up	
13	Nature of user participation	<input type="checkbox"/> Passive participation <input type="checkbox"/> Information <input type="checkbox"/> Consultation <input type="checkbox"/> Contribution <input type="checkbox"/> Partnership <input type="checkbox"/> Self-mobilisation	
14	Type of slum / settlement	<input type="checkbox"/> Recognized <input type="checkbox"/> Un-recognized	
15	Aim(s) of the intervention	<input type="checkbox"/> Not stated <input type="checkbox"/> Not explicitly stated (Write in, as worded by the reviewer) <input type="checkbox"/> Stated (Write in, as stated by the authors)	

Appendix 5: Coding and data extraction tool for studies that are shortlisted after screening based on inclusion and exclusion criteria

16	Has the study stated the causal pathways or theory of change for the intervention?	<input type="checkbox"/> Not stated <input type="checkbox"/> Not explicitly stated <input type="checkbox"/> Stated	
17	Summary of the theory of change		
18	How long has it been since the intervention was implemented?	<input type="checkbox"/> Not stated <input type="checkbox"/> Not applicable <input type="checkbox"/> Unclear <input type="checkbox"/> <2 years <input type="checkbox"/> 2-5 years <input type="checkbox"/> > 5 years	

Section IV: Results and Conclusions

		Tick and Give Details where Relevant				
19	Indicators/ Outcomes captured	Sector	Outcome	Indicator	Finding	Significance level
		N	t-stat / z value	P-value	S.E.	
20	What are the results of the study as reported by the author?					
21	What do the author(s) conclude about the findings of the study?					

What is the evidence on what makes an effective urban planning framework for improved access to water, sanitation, and electricity services in low-income or informal settlements? Protocol

22	What are the limitations of the study?	<input type="checkbox"/> Not stated <input type="checkbox"/> Not explicitly stated <input type="checkbox"/> Stated	
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Section V: Study Method

		Tick Relevant	Details
23	Study Timing <i>(Please indicate all that apply and give further details where possible.)</i>	<input type="checkbox"/> Cross-sectional <input type="checkbox"/> Panel Data <input type="checkbox"/> Longitudinal <input type="checkbox"/> Before After <input type="checkbox"/> Only after <input type="checkbox"/> Not stated/ Unclear <input type="checkbox"/> Any other	
24	Research method (indicate as appropriate)	<input type="checkbox"/> Experimental <input type="checkbox"/> Quasi-experimental <input type="checkbox"/> Observational	
25	What is the overall design and method of the study? <i>(Please tick all relevant.)</i>	<input type="checkbox"/> Quantitative <input type="checkbox"/> Qualitative <input type="checkbox"/> Both <input type="checkbox"/> Other	

Section VI: Methods - Data Collection

		Tick and give Details where Relevant	
26	Which methods were used to collect the data? <i>(Please indicate all that apply and give further detail where possible.)</i>	<input type="checkbox"/> Primary <input type="checkbox"/> Secondary	
27	Details of data collection instruments or tool(s). <i>(Please provide details including names for all tools used to collect data, and examples of any questions/items given. Also, please state whether source is cited in the report.)</i>	<input type="checkbox"/> Explicitly stated <input type="checkbox"/> Implicit <input type="checkbox"/> Not stated/ unclear	
28	Data period	<input type="checkbox"/> Explicitly stated <input type="checkbox"/> Implicit <input type="checkbox"/> Not stated/ unclear	

Section VII: Methods - data analysis

		Tick Relevant	Details
29	Which methods were used to analyse the data?	<input type="checkbox"/> Explicitly stated <input type="checkbox"/> Implicit <input type="checkbox"/> Not stated/unclear	
30	Do the authors describe strategies used in the analysis to control for bias from confounding variables?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not applicable	
31	Do the authors describe any ways they have addressed the repeatability or reliability of data analysis? (e.g. using more than one researcher to analyse data, looking for negative cases.)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not applicable	
32	Do the authors describe any ways that they have addressed the validity or trustworthiness of data analysis? (e.g. internal or external consistency, checking results with participants. Have any statistical assumptions necessary for analysis been met?)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not applicable	
33	If the study uses qualitative methods, were the findings of the study grounded in/ supported by the data? (Consider whether: *enough data are presented to show how the authors arrived at their findings *the data presented fit the interpretation/ support the claims about patterns in data *the data presented illuminate/ illustrate the findings *(for qualitative studies) quotes are numbered or otherwise identified and the reader can see they don't come from one or two people.)	<input type="checkbox"/> Well grounded/ supported <input type="checkbox"/> Fairly well grounded/ supported <input type="checkbox"/> Limited grounding/ support	
34	If the study uses qualitative methods, consider the findings of the study in terms of their breadth and depth (Consider 'breadth' as the extent of description and 'depth' as the extent to which data has been transformed/ analysed) * A range of issues are covered *The perspectives of participants are fully explored in terms of breadth (contrast of two or more perspectives) and depth (insight into a single perspective) *richness and complexity has been portrayed (e.g. variation explained, meanings illuminated) *There has been theoretical/ conceptual development.)	<input type="checkbox"/> Good/Fair breadth, but little depth <input type="checkbox"/> Good/ fair depth but very little breadth <input type="checkbox"/> Good/ fair breadth and depth <input type="checkbox"/> Limited breadth or depth	

Appendix 6: Quality appraisal questions

Section I: Quality appraisal questions

	Principles of Quality	Questions	Appraisal rating High/ Medium/ Low/ Can't tell
1	Conceptual framing	Does the study acknowledge existing research?	
		Does the study construct a conceptual framework?	
		Does the study pose a research question or outline a hypothesis?	
2	Transparency	Does the study present or link to the raw data it analyses?	
		Have the contexts of data sources been retained and portrayed?	
		Does the study declare sources of support/funding? Is there a potential conflict of interest?	
3	Appropriateness	Does the study identify a research design?	
		Does the study identify a research method?	
		Does the study demonstrate why the chosen design and method are well suited to the research question?	
4	Cultural sensitivity	Does the study explicitly consider any context-specific cultural factors that may bias the analysis/findings?	
5	Validity	To what extent does the study demonstrate measurement validity?	
		To what extent the causal conclusion arrived in the study valid?	
		To what extent the results of the study can be generalized to other situations?	
		To what extent the findings of the study are biased by the research activity?	
6	Sample	Has the sample design and target selection of cases been defended and explained clearly?	
7	Reliability	To what extent are the measures used in the study stable?	
		To what extent are the measures used in the study internally reliable?	
		To what extent are the findings likely to be sensitive/changeable depending on the analytical technique used?	
8	Analysis	Has the approach and formulation to analysis been clearly conveyed?	
		Have the depth and complexity of data been clearly captured?	
9	Cogency	Does the author 'signpost' the reader throughout?	
		To what extent does the author consider the study's limitations and/or alternative interpretations of the analysis?	
		Are the conclusions clearly based on the study's results?	
10	Auditability	Has the research process been clearly documented?	

Section II: Overall assessment of the study

11	<p>What is the overall quality of the study?</p> <p><i>(taking into account all the quality assessment issues)</i></p>	<p><input type="checkbox"/> High (quality)</p> <p><input type="checkbox"/> Medium (quality)</p> <p><input type="checkbox"/> Low (quality)</p>	<p>For Qs. 1 to 10, High = 3; Medium = 2; Low = 1; Can't tell = 0</p> <p>Scores obtained from summation of the responses from Q 1 to 10 would be used to determine the overall quality of the study.</p> <p>The rating criteria is as follows:</p> <p>Scores >50 - high quality; >25 medium quality and; ≤ 25 low quality</p>
12	Reason(s) for inclusion		

First produced in 2014 by:

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