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CRITICAL INDICATORS FOR MEASURING NEIGHBORHOOD SATISFACTION IN STATE PROVIDED HOUSING IN SOUTH AFRICA

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ABSTRACT

The objective of this paper was to establish the attributes that determines neighborhood satisfaction in South Africa low-income housing subsidy scheme utilizing the Delphi approach. This is because the perception and housing satisfaction of low income housing beneficiaries toward their housing condition can be studied by examining their satisfaction towards the neighborhood factors. The Delphi method was used where the views of housing experts were solicited on 26 potential attributes as identified from literature. Consensus was achieved after three iterative rounds. The expert's scored each attributes on a 10-point ordinal scale of impact significance, where 1-2=No impact and 910=very high impact. The scales adapted for consensus were: strong consensus, median 9-10, inter quartile deviation (IQD) ≤ 1; good consensus, median 7-8.99, IQD$\geq 1.1 \leq 2$; weak consensus, median $\leq$ 6.99and IQD$\geq 2.1 \leq 3$. The key findings indicate that there was a good to strong consensus of 19 attributes which were key attributes that the experts perceived as determinants of neighborhood satisfaction; while 6 other attributes had weak consensus, as they were considered to have a lesser impact in determining residents' neighborhood satisfaction. However, attributes with weak consensus were the attributes that are highly regarded as core neighborhood factors in other housing settings. The study contributes to the body of knowledge on the subject where no consensus has been reached pertaining to indicators for measuring neighborhood satisfaction in subsidized low-income housing in South Africa.

Key words: Delphi method, neighborhood satisfaction, residential satisfaction, subsidized low-income housing

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Introduction

Amerigo and Aragones [1] informs that the study of residential satisfaction has mostly been applied to the house and to its surrounding neighborhood. Both have been researched from two points of view: physical, conforming to equipment and services; and social, referring to the social linkages established both in communal areas of the building and in the neighborhood. However, there seems to be a problem in trying to outline the physical boundaries of the house and of the neighborhood. For example, when referring to a house, we should take into account not only it private space, but also the semi-public spaces immediately surrounding it. However, prior to asking which measures might impact reported neighborhood satisfaction, we need to focus on the question of what residents define to be their perception of the neighborhood. According to Rapoport [2], the appropriate definition of these areas is very significant at certain socio-economic levels due to the perceptions they involve. Rapoport further argue that spatial perceptions may vary substantially as a function of variables like social and cultural status. The concept of neighborhood on the other hand is even more confusing according to Amerigo and Aragones [1]. Only few scholars have clearly defined to which physical area it involves, while most other scholars use terms like community, district, neighborhood amongst others, without defining them specifically. However, Marans and Rodger [3] are one of the few exceptions that put forward clearly differentiated levels within the residential environment. In their work on the understanding of community satisfaction, they defined the neighborhood (environment) as the intermediate zone between the macro-neighborhood and micro-neighborhood, including a more-or-less large area near the occupant's house, and where relationships are formed with other people living in it. This means that the individuals residing in a space and the physical objects they use are closely bound into one unit, thus forming an outline [1]. According to this concept, neighborhood cannot be specifically defined; rather the concept can be referred to as a personal category, which is what the residents themselves consider it to be. Another significant characteristic when trying to define the neighborhood is given by the sense of belonging to it, or identification with it.

Neighborhoods are the localities in which people live and are an appropriate scale of analyzing local ways of living [4]. Neighborhood can have a huge influence on the occupants' health, wellbeing, and quality of life [5]. Likewise, the term neighborhood is often used to describe the sub-divisions of urban or rural locations such as cities, villages, and towns. These subdivisions have some particular physical or social characteristics that distinguish them from the rest of the settlements. In addition, Brower [6] informs that the neighborhood form is derived from a particular pattern of activities, the existence of a common visual motif, an area with continuous boundaries or a network of often-travelled streets. Diverse definitions serve different interests, so that the neighborhood may be seen as a source of place-identity, an element of urban form, or a unit of decision making. It is presumed that research uses multiple definitions of a neighborhood simultaneously to reflect the fact that neighborhood is not a static concept but rather a dynamic one [7]. Likewise, planners and designers have also

thought of the neighborhood setting as a fixed, controllable, and imaginable physical area. Hence, in this paper, the definition of neighborhood does not refer to the geographical area which limits it, but rather to the occupant's perception and to their sense of belonging as supported by Amerigo and Aragones [1]. The definition of neighborhood as used in this paper align with Marans and Rodgers [3] definition of the intermediate zone between the macro- and micro-neighborhood, including a more-or-less large area near the occupant's house, and where relationships are formed with other people living in it. In this way, the neighborhood does not have a fixed surface, but varies from one occupant to another.

Research assessing residents' satisfaction with their dwellings have characteristically focused primarily on the dwelling unit with negligible or limited emphasis on the surrounding environment [8]. Yet, housing cannot be separated from its surrounding neighborhood as the level of acceptance or satisfaction may be more dependent on where the unit is situated than on its actual or perceived quality in most cases. For instance, Onibokun [9] argues that the habitability of a house is determined not only by the engineering elements, but also by social, behavioral, cultural, and other elements in the entire societal-environmental system. The dwelling according to Onibokun may be adequate from the engineering and design point of view but may not necessarily be adequate or satisfactory from the inhabitants' point of view. Thus Onibokun established that the house is only one connection in a chain of factors which determine people's relative satisfaction with their accommodation. Hence, utilizing the Delphi technique, this paper establishes the attributes that determines neighborhood satisfaction in South Africa. This is because the perception and housing satisfaction of residents toward their housing condition can be studied by examining their satisfaction towards the neighborhood factors. The context of the paper is the low-income housing space in three metropolitan municipality cities in South Africa.

The Delphi Technique

The Delphi technique was originally developed in the 1950s as a tool for forecasting and problem solving of complex topics at the Rand Corporation by Helmer and Dalkey [10]. The Delphi method attempt to 'align' the sometimes conflicting positions of experts into a coherent and unified perspective. The technique is relatively simple, as it consists of a structured process for collecting and synthesizing knowledge from a group of pre-selected experts by means of a series of questionnaires accompanied by controlled opinion feedback [11]. The questionnaires are presented in the form of an anonymous and iterative consultation procedure by means of surveys (postal and/or e-mail). These questionnaires are designed to elicit and develop individual expert responses to the subject matter and to enable the experts to reconsider views as the group's work progresses in agreement with the objective of the study. The reasoning behind the Delphi method is to address and overcome the disadvantages of traditional forms of discussion by group, particularly those related to group dynamics. This method

is predominantly used to facilitate the formation of a group consensus [12] as it was developed in response to the problems associated with conventional group opinion assessment techniques, such as Focus Groups, which can create problems of response bias due to the dominance of powerful opinion-leaders [13]. Fundamentally, the method serves to shed light on the evolution of a situation, to identify priorities or to draw up prospective scenarios as found in the present research paper.

When to Use the Technique

The Delphi method is mainly used when long-term issues have to be assessed such as the subject of the current research. This is because it is a procedure used to identify statements (topics) that are relevant for the future; it reduces the tacit and complex knowledge to a single statement and makes it possible to judge upon [14]. Hence the use in combination with other methodologies like survey design in modelling neighborhood satisfaction can be interesting. On the other hand, in more complex issues, when the themes cannot be reduced that much or when thinking and discussions in alternatives are the major target, the Delphi is not the method of choice. It is also suitable if there is the (political) attempt to involve many persons in processes [15]. Hence, Linstone and Turoff [16] argue that one or more of the following properties could lead to the need for the use of the Delphi technique:

- When the problem of inquiry does not lend itself to precise analytical techniques but can benefit from subjective judgments on a collective basis;
- When the research need to contribute to the examination of a broad or complex problem with no history of adequate communication and may represent diverse backgrounds with respect to experience or expertise, which is a major premise of the current research;
- More individuals are needed than can effectively interact in a face-to-face exchange;
- Time and cost to make frequent group meetings is limited;
- The efficiency of face-to-face meetings can be increased by a supplemental group communication process;
- Disagreements among individuals are so severe or politically unpalatable that the communication process must be refereed and/or anonymity assured;
- The heterogeneity of the participants must be preserved to assure validity of the results, such as the avoidance of domination by quantity or by strength of personality called the 'bandwagon effect'.

According to a number of researchers, context is everything in deciding whether and when to use the Delphi method. According to Adler and Ziglio [11], the key questions that need to be asked are: what kind of group communication process is desirable in order to explore the issue? Who are the people with expertise on the issue and where are they located? What are the alternative techniques available and what results can reasonably be expected from their application?

Limitations of the Delphi Technique

The method consists of questioning the experts by means of successive questionnaires, in order to reveal convergence and any consensus there may be. The main stages of this process which was adapted in the present research work: I) Step 1. Determination and formulation of questions; ii) Step 2. Selection of experts; iii) Step 3. Formulation of a first questionnaire that is sent to the experts; iv) Step 4. Analysis of the answers to the first questionnaire; v) Step 5. Formulation of a second questionnaire that is sent to experts; vi) Step 6. Sending of a third questionnaire, and vii) Step 7: Summary of the process and drawing up of the final report.

A major problem identified by research into the implementation and application of Delphi surveys has been the tendency for experts to over-simplify particular issues, and treat them as isolated events. This is particularly the case in forecasting, where experts tend to think in linear terms rather than in sequential events, where a holistic view that involves complex chains and associations can be applied. This has led to the development of techniques such as 'cross impact matrix forecasting', which are intended to compare a range of 'possible futures' against each other, and to consider the displacement, substitution and multiplier effects associated with the scenarios identified by the experts involved [11]. However, there have been several studies [13] [12] supporting the Delphi method. These studies seem to suggest that in general, the Delphi method is useful to explore and unpack specific, single-dimension issues like the present paper objective. On the other hand, there is less support for its use in complex, multi-dimensional modelling. In these cases, the evidence does suggest that data gathered by Delphi surveys is a useful input, when supported by data gathered from other sources, to complex scenario-building.

Research Methodology

A comprehensive methodical literature review was conducted in journal articles, conference proceedings and relevant housing books. A total of 26 neighborhood indicators were identified from the literature. The identified attributes were characterized as the factors which determine neighborhood satisfaction and where used to develop a Delphi questionnaire. A panel of experts were selected and participated in a three round of Delphi process. The experts' rating was based on an ordinal scale of 1 to 10 with 1 being no impact and ten being very high impact.

Since panelists form the cornerstone of the Delphi technique, clear inclusion criteria were applied and outlined as a means of evaluating the results and establishing the study's potential relevance to other settings and populations [17]. The selection of panelists for the study was based on criterion sampling. Panelists were selected for a purpose to apply their knowledge to the concept raised in the objective based on the criteria that was developed. This was necessitated because the technique does not

depend on a statistical sample that attempts to be representative of any population. It is a group decision mechanism requiring qualified experts who have deep understanding of the issues [18]. Hence, one of the most critical requirements is the selection of qualified experts as it is the most important step in the entire Delphi process because it directly relates to the quality of the results generated [19]. The careful selection of the panel of experts is a keystone to a successful Delphi study.

In choosing panelists for this study, each expert was required to meet at least five of the following minimum criteria of: residency- have lived or is living in one of the South Africa Metropolitan or District Municipalities cities; has knowledge of the low-income housing situation in South Africa; academic Qualification, has been presented an earned degree; experience related to the low-income or other sustainable development or human settlement context; employment in a professional or voluntary capacity; influence and Recognition; authorship of peer-reviewed publications in the field of housing with emphasis on South Africa; research, has received research funds that support housing development studies for the low-income group or other human settlement related issues; teaching, has served as an individual or as a collaborative instructor in the teaching of one or more college or university courses focusing on the sustainable development or related field; membership of a professional body so that their opinions may be adaptable or transferable to the population and k) willingness to fully participate in the entire Delphi studies.

The adoption of five criteria was considered more robust than the suggested number of at least two criteria by Rodgers and Lopez [20]. The five minimum criteria were framed after the four recommendations made by Adler and Ziglio [11], with the inclusion of experts' residency status, which was considered to be compulsory for all selected experts. This was considered significant because experts were required to have a wide-ranging understanding of the low income housing context in South Africa. Also, a minimum number of five criteria were set because the technique may be undermined if panelists are recruited who lack specialist knowledge, qualifications and proven track records in their respective field amongst others.

Panel members were identified from four sources. The first source was from the South Africa institutions of higher learning faculties, departments, research institutes amongst others. The second source was the Department of Human Settlement. This is because they are the ones who are vested with the responsibility for the initiation and development of subsidized low income housing in the country. Hence their involvement in the Delphi process was a key consideration. The third source was from various conference proceedings such as the annually held Built Environment Research Conference hosted by the Association of Construction Schools of Southern African, Construction Industry Development Board biannual post graduate research conference amongst others. Individuals who had frequently appeared as authors or key speakers related to housing and human settlement issues in these proceedings were identified as potential experts on the study. The fourth source was the references of individuals who

had committed their lives working in the area of sustainable human settlement and housing related issues in Southern Africa. With regard to the recruitment process, panelists were recruited via e-mail, with a brief overview of the study objective sent to them. All experts selected for the current study met a minimum of five criteria's set for the study.

From all the sources mentioned above, 55 invitations were sent out. Out of 55 invitations, 17 responded to the invitation; 17 completed the first round and 15 were retained throughout the study as one panelist could not meet with the demand of the study while the other was deceased during the course of the study, but had sent through his opinions for the first round. Therefore, the Delphi study retained 15 active members during the iterative round. This number of panelists was considered adequate based on literature recommendations from scholars which have employed the technique previously [21] [18]. Based on the above and the fact that the Delphi method does not depend on the statistical power, but rather on group dynamics for arriving at consensus among experts, the panel of 15 experts was considered adequate.

In the first round the experts were asked to rate the impact of the indicators which determine residential satisfaction in South Africa low-income housing. The second and third (last) round of the Delphi questionnaire included a qualitative component that offered experts the opportunity to provide additional feedback in the form of written comments. After round II and round III, the degree of consensus achieved in the Delphi process was assessed by calculating the group median, mean, standard deviation and inter-quartile deviation. The group median was used as a feedback to the experts in the successive rounds. Each round built on responses to the former round. Experts were provided with a summary of the series of rounds. This summary included the feedback to each expert: his or her own score on each item, the group median ratings, and an abstract of written comments. The experts were then asked to reflect on the feedback and re-rate each factor in light of the new information. This process was in line with the Delphi characteristics of: 1) anonymity which encourages honest opinion free from bandwagon effect; 2) iteration, which allows experts to change their views in subsequent rounds; 3) controlled feedback which illustrates the dissemination of the group's response, in addition to individual's previous response and 4) the effective engagement of participants who are separated by large distances because it can be distributed by mail or online (Hasson et al., 2000). This method was therefore appropriate in validating the core neighborhood satisfaction indicators identified. The limitation to this Delphi study was that experts were not allowed to add any other core factors or indicators. The scales of consensus adapted for this research were: strong consensus, median 9-10, mean 8-10, inter quartile deviation (IQD) ≤ 1; good consensus, median 7-8.99, mean 6-7.99, IQD$\geq 1.1 \leq 2$; weak consensus, median ≤ 6.99, mean ≤ 5.99 and IQD$\geq 2.1 \leq 3$.

Findings and Discussion

First, all panel members who participated in the Delphi process were from South Africa. Two are currently residing at the Nelson Mandela Bay metropolitan municipality; seven reside in the City of Johannesburg, four in Ekurhuleni, one in Tshwane and another in the City of Cape Town. Also, 80% of the experts were male, while 20% were female. The female experts who were invited to participate declined the invitation hence the dominance of male in the study. From the 15 experts who completed the three rounds of Delphi, 3 had a Doctor of Philosophy (PhD) degree, 10 had a Master of Science (MSc) or equivalent degree and 2 others had a Bachelor of Science or an equivalent degree. All experts were from various fields, ranging from urban and spatial planning, housing studies, urban and social policy amongst others. From their curriculum vitae analysis, they are all involved with low-income housing issues.

In terms of their current occupation, 8 of the experts were employed by Universities of higher learning, 1 work as a housing practitioner with the City of Johannesburg, 4 were employed by various Government Departments, 1 in an NGO and another in a research institution. All expert panelists held various senior positions in their organizations and were involved in low income and other housing issues at different levels. The expert panelist had a cumulative of 284 years of experience. The minimum was four while the maximum was 32 years with a mean of 18.93 years. The experts especially the academics have extensively contributed to the body of knowledge in Sustainable Human Development with vast publications in peer reviewed conferences, journals, book chapters and books. The experts were professionally registered in various professional bodies in South Africa and international.

Secondly, form the summary of the comprehensive review of literature highlighted sets of attributes that are potentially relevant to neighborhood satisfaction decisions by the occupants of low-income housing in South Africa. Though the reviewed literatures were based on studies from the developed countries, these were collectively used to examine the attributes that determine residential satisfaction in subsidized low-income housing in South Africa (a developing country). The influence of the attributes on neighborhood satisfaction was obtained as a product of the impact on the housing occupants. The level of impact of the attributes as categorized on the questionnaire was established by assessing the extent to which the listed attributes will determine the occupant's satisfaction with their neighborhood.

Hence, the scores for the listed neighborhood and environmental characteristics revealed that from the 26 listed variables, four were scored to have a very high impact (VHI: 9.00-10.00) in determining residential satisfaction, while, 15 variables had a high impact (HI: 7.00-8.99) and 7 other variables were scored to have between low to medium impact (LI & MI: 3.00-6.99). Conversely, none was found not to have an impact in the determination of residential satisfaction (Table 1). In addition, the IQD scores revealed that consensus was achieved for a majority of the items (24) with a

score of between 0.00 and 1.00. Nonetheless, consensus was not achieved for two elements; being the Parking facilities and the Police protection with an IQD score of 1.50 which was more than the acceptable IQD score for the study. Furthermore, the Parking facilities had mean rating=4.67 and an SD=1.68; while the Police protection factor had a mean rating=7.40 and SD=1.35; showing the level of consistency within the experts rating of the factors.

Table 1 : Neighborhood and environmental characteristics
(SD – Standard deviation; IQD - Interquartile deviation)

Attributes	**Median**	**SD**	**IQD ≤ 1**
Public transportation and services	9	0.70	0.50
Closeness to workplace	9	1.18	0.50
Secure environment	9	0.80	1.00
Incidence of burglary activities	9	0.99	1.00
Location of dwelling unit	8	1.32	1.00
Police protection	8	1.35	1.50
Closeness to shopping areas	8	1.19	1.00
Closeness to schools	8	1.35	0.50
Closeness to hospitals/clinics	8	1.36	1.00
Street lighting at night	8	1.39	0.50
Friends and neighbors	7	1.32	0.50
Closeness to the place of worship	7	1.41	0.50
Walkways and access to main roads	7	0.90	0.50
Privacy from other neighbors	7	0.99	1.00
Smoke or odors	7	1.88	1.00
Physical condition and appearance of the neighborhood	7	1.16	0.00
General cleanliness of the neighborhood	7	0.96	0.50
Proximity to Police services	7	1.32	1.00
Community hall	7	0.90	0.50
Landscape of the neighborhood	6	1.46	0.50
Closeness to playground and other recreational facilities	6	1.10	0.00
Street and highway noise	6	1.28	0.00
Facilities for the disabled	6	1.53	1.00
Adequacy of on-street parking (bays)	5	1.39	1.00
Elderly centers	5	1.15	0.00
Parking facilities	4	1.68	1.50

Findings from the assessment of the attributes that determines neighborhood and environmental characteristics, collaborates the results of a majority of studies on housing satisfaction in relation to the neighborhood attributes [22] [3] [23] upon which the current study attributes were also based. Closeness to workplace, public transportation and services and the incidence of burglary activities were rated as variables with a very high impact as these impacts on the quality of life of the occupants. These findings were also found to collaborate with the works of Bjorlund and Klingborg [24] findings done in eight Sweden municipalities, where it was found that occupant's neighborhood satisfaction is related to their satisfaction with proximity to commercial areas, proximity to open spaces, less noisy environments with no traffic congestion, proximity to town centers and a conducive environment. On the other hand, the current study findings did not support the study conducted by Abdul and Yusof [25] where it was highlighted that the neighborhood facility attributes that are most dominant in determining the level of satisfaction towards housing are low level of satisfaction with the public transport, and lack of parking areas. However, the present study finding is also consistent with the alternative micro-neighborhood theory, which deals with social relationships among neighbors as the present study has shown - Good relationship with the neighbor. The result from the research further revealed the complex characteristics of neighborhood satisfaction as also pointed out by the works of Amerigo and Aragones [1], Marans and Rodgers [3] and Marans & Spreckelmeyer [26].

Therefore, findings from the study revealed that the attributes that determines neighborhood satisfaction in South Africa subsidized low-income housing are similar to other cultural context as revealed by the median scores displaying a strong to good consensus. These attributes are: closeness to workplace; landscape of the neighborhood; secure environment; incidence of burglary; closeness to shopping areas; closeness to schools; hospitals and places of worship amongst others. Nevertheless, consensus was not achieved for the Police protection and Parking facilities attributes which have been found to be a strong determinant of housing satisfaction in other cultural context [27] [28]; despite Police protection was rated to have a high impact and Parking facilities rated to have a low impact. These findings suggest that when a neighborhood is crime free and there is the presence of police protection in form of dedicated police post in the neighborhood, occupants feel safe and are thus satisfied with the neighborhood. Likewise, when the distance occupant's commute to their place of work and the availability of public transport is satisfactory, this will also make them to be satisfied with their neighborhood and environment.

Conclusion

This paper examined neighborhood satisfaction in the context of 26 identified features as compiled from an extensive literature survey utilizing a Delphi approach. Findings from the study supported work done by previous scholars that satisfaction with neighborhood features is a vital determinant of neighborhood satisfaction to the extent

that residents are willing to compromise the inefficiencies within the dwelling unit because of the satisfaction that is provided by the neighborhood facilities and features. Further findings revealed that there was a high variability amongst the attributes of Police protection and Parking facilities impact occupants' satisfaction with their neighbor.

In conclusion, the results suggest that the attributes that brings about residential satisfaction in South Africa low-income housing are similar to the determinants in other cultural context. Further, neighborhood satisfaction is assured if there is a consideration of these factors in the development of subsidized low-income housing for the poor in South Africa. Also, the survey findings revealed that, the experts judge the attributes of closeness to workplace; landscape of the neighborhood; secure environment; incidence of burglary; closeness to shopping areas; closeness to schools; hospitals and places of worship amongst others as elements which will bring about neighborhood satisfaction to low-income housing occupants, which from the Delphi scores of the experts have been described as being of significant influence and having a high impact in determining residential satisfaction.

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