Science real and relevant conference 2010
Proceedings homepage://www.conference.csir.co.za/

Does participating in the development of Medium-Density Mixed Housing projects make a difference in the residents' satisfaction with the quality of their environment?

Nosizo Sebake[1*]

[1]CSIR Built Environment, PO Box 395, Pretoria 0001

*Corresponding author: Nosizo Sebake: ssebake@csir.co.za

Reference: BE04-PO-F

Abstract

CSIR Built Environment has recently completed a multiyear research project, undertaken by Landman *et al*, that aimed to determine the appropriateness and applicability of medium-density mixed housing (MDMH) developments in South Africa. The research identified and described five critical factors that various stakeholders, including residents, financiers, officials and developers, consider necessary for MDMH to be successful. These critical success factors include affordability, design and layout, safety and security, management and maintenance, and neighbourliness.

The premise of this paper is that the quality of the built environment directly influences the people who use it. Good-quality spaces, for example, promote social inclusion, socially cohesive behaviour and citizenship, whereas a decline in the quality of urban space can contribute to anti-social behaviour. The built environment is created by professionals who, in the context of social housing, may never know the users of the buildings they develop. This has created a widening gap between built environment professionals (particularly designers) and end-users, resulting in created environments increasingly failing to meet the needs of users.

This paper will use two case studies from the multiyear research project to investigate whether perceptions about the quality of the built environment were affected by the residents' participation, or lack thereof, at the planning and design stages of the developments.

1. Introduction

Medium-Density Mixed Housing (MDMH) developments are supported by the National Department of Housing's *New Comprehensive Plan for the Creation of Sustainable Human Settlements* (2004), which is generally referred to as *Breaking New Ground (BNG)*. These developments are considered important in positively transforming the housing environment in South Africa, which is aligned with the Millennium Development Goals (MDGs) adopted by the United Nations member states in 2000. The Department of Housing's main focus within the MDGs deals with the development of sustainable human settlements.

It was against this setting that CSIR Built Environment undertook a multiyear, research project on MDMH in South Africa, undertaken by Landman *et al*, . The overall aim of the multiyear study was to determine whether MDMH developments were appropriate and applicable in the South African context.

1.1 Research aims

The paper aims to investigate whether the involvement of the residents of social housing developments at the planning and design stages of the implementation of MDMH projects affects their satisfaction with the quality of their built environment.

1.2 Relevance of the research

Due to the amount of time we spend in buildings, the quality of our built environment makes a direct contribution to our everyday lives. The social benefits of high-quality built environments have long been promoted in urban planning and design on the grounds that they are places where positive social activity and behaviour abound. Good-quality spaces promote social inclusion, socially cohesive behaviour and citizenship, whereas a decline in the quality of urban space can contribute to anti-social behaviour (Dempsey 2008).

1.3 Scope and limitations of this paper

This paper uses two case studies from the multiyear research project. Portions of existing findings from the specific case study reports are used to address the research aim of this paper.

1.4 Structure of the paper

This paper has been structured under the following headings:

- **Introduction:** Introduces the paper in terms of its aim, relevance and scope.
- **Methodology:** Outlines the methodology used to undertake the multiyear research.
- **Background:** Provides some background on social housing and how this form of housing is delivered in South Africa.
- **Case studies:** Presents the two case studies that have been selected for this paper.
- **Findings:** Ppresents the findings of the two case studies presented.
- **Discussions:** Discusses the findings.
- **Conclusions:** Concludes the paper.

2. Methodology

The views of all the residents were obtained through household surveys distributed to a sample of residents in the developments. The survey questionnaire was structured into seven sections. The first section required demographic and socio-economic information. The following five sections required the views of residents on the five critical success factors named above. The importance of each of these five sections, linked to the critical success factors, was rated (by the residents) on a scale from ‘one’ (i.e. ‘not at all’ [important]) to ‘five’ (i.e. [important] ‘to a large extent’). The final section included three open-ended questions referring to factors that may have been excluded. The survey questionnaire facilitated both quantitative and qualitative data analysis, as it included both closed and open questions. The closed questions were analysed. The open questions elaborated on many of the issues concerned and were analysed through the identification of a number of themes and sub-themes that arose (Landman *et al*., 2009a; Landman *et al*., 2009b).

This paper focuses on highlighting the findings of two case studies for both quantitative and qualitative analysis according to the one critical success factor that is directly linked to the built environment, namely ‘Design and Layout’.

3. Case studies

Seven case studies were selected for the multiyear research project. These were selected to address the research questions posed, to highlight the critical success factors and to learn from them. They were not selected for comparative purposes as they differ significantly in terms of size, built form and types of mix involved. The case studies are presented below:

- Brickfields, Carr Gardens, Pennyville and Cosmo City (City of Johannesburg);
- Amalinda (Buffalo City Municipality);
- Sakhasonke (Nelson Mandela Bay Metropolitan Municipality);
- The Hull Street Project (Sol Plaatje Municipality).

All these case studies adhered to the selection criteria, in that their characteristics encompassed mediumdensity and various forms of mix (i.e. income, housing, tenure) within a low-rise development.

Two of the seven case studieswere selected for this paper because their construction had been completed at the time the surveys were undertaken (2007 – 2009). The completion of these projects at the time of the resident surveys ensured that more holistic views could be obtained from the residents as they had resided in the developments for longer than a year and had thus experienced different conditions (i.e. summer and winter) in their respective units. Table 1 shows the two case studies selected for this paper.

Table 1 Selected case studies

Cases	Municipality, Province	Density (no. of units)	Character
Amalinda	Buffalo City Municipality, Eastern Cape	77 du/ha (598 units)	Medium-density mix (housing, income and tenure types)
Sakhasonke	Nelson Mandela Metro Municipality , Eastern Cape	69 du/ha (337 units)	Medium-density mix (housing and tenure types)

3.1 Case study 1: Amalinda Village Project

Figure 1: Amalinda Village and its immediate surroundings (Source: Google Earth).

Figure 2: Four storey walk-ups with a loft in the top floor apartment, built in phase two.

The Amalinda Village Project, consisting of 598 units (unit sizes varying from $31m^2$ to $51m^2$ per unit) was constructed in phases between 2000 and 2005. The project is located in the Buffalo City Municipality (Eastern Cape), close to the inner city with numerous socio-economic opportunities (Landman *et al*., 2009a),

The project was built in two phases. The former phase consists of 34 blocks and the latter of 10 blocks. The Amalinda Village Project is designed around a central open space situated on the highest part of the hill from where the blocks pan out in concentric circles, following the natural contours. Some parts of the site are steep and consequently different platforms were created to accommodate the natural gradient of the ground, with the majority of the buildings three-storey walk-ups (Figures 1 and 2) (Landman *et al*., 2009a).

There are slightly more female (51%) than male (49%) occupants in the project, with a majority of black people (83%), who fall within the ages of 18 – 30 years (62%). More than half (63%) of the households within the development consist of 3 – 4 persons per dwelling unit. Almost all the residents (94%) in the development at the time of the survey had been residing in the Amalinda Village Project for more than a year (Landman *et al*., 2009a).

3.2 Case study 2: Sakhasonke Village Project

Figure 3. Semi-detached double storey unit.

Figure 4. Three unit cluster.

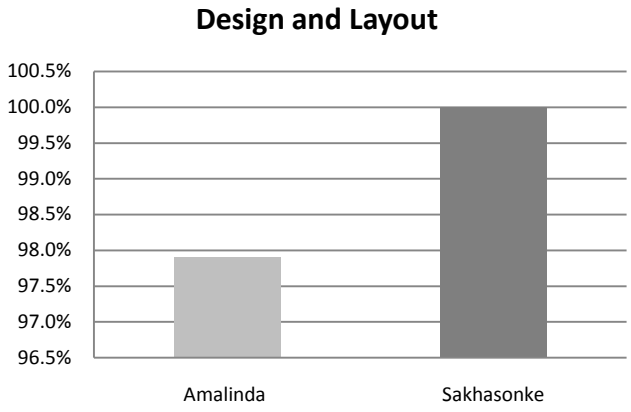
The Sakhasonke Village Project consists of 337 units (average floor area of the units is 46m^2) and was constructed in phases between 2000 and 2006. The construction began with an exemplar house which was used to gauge the response of end-users. Members of the adjacent communities, including the Gqebera Township community, were invited in the planning and implementation phase, through workshops, training and consultations during this process. The project is located in the Nelson Mandela Metro Municipality (Eastern Cape), relatively close to the inner city with numerous socio-economic opportunities. There is a mix of building types within the development. Although the units have similar designs, the arrangement varies between semi-detached units and clusters with three units (Figures 3 and 4) (Landman *et al*., 2009b).

There are slightly more female (79%) than male (21%) occupants in the project, with a majority of black people (96%) who fall within the ages of 31 – 55 years (63%). More than half (58%) of the households within the development consist of between 3 – 4 persons per dwelling unit. Almost all the residents (88%) in the development at the time of the survey had been residing in the Sakhasonke Village Project for more than a year (Landman *et al*., 2009b).

4. Findings

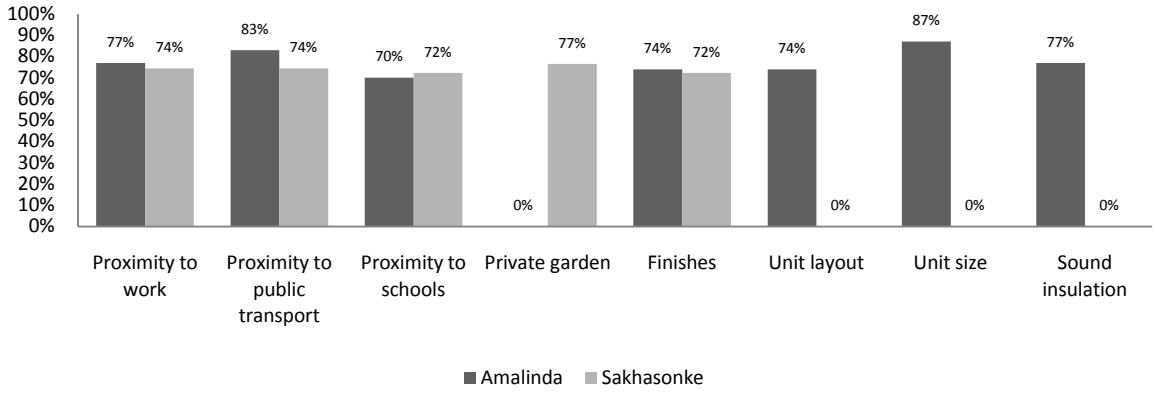
The findings from the resident surveys presented in the multiyear research reports (Landman *et al*., 2009a; Landman *et al*., 2009b), particularly highlighting the 'design and layout' critical success factor, are outlined and discussed below.

Overall, in terms of the 'design and layout' critical success factor, the majority of respondents from both projects rated this as important 'to a large extent' – Amalinda Village Project (97.9%) and Sakhasonke Village Project (100%)(Graph 1).



Graph 1: Proportion of respondents who viewed the 'design and layout' of their development as important 'to a large extent'.

Respondents from the two case study projects highlighted several sub-factors as being important 'to a large extent'(Graph 2).



Graph 2: 'Design and layout' sub-factors viewed by respondents as important 'to a large extent'.

The graph shows that a high proportion of respondents from both case study projects considered proximity to work, public transport and schools as important 'to a large extent', and that only the Amalinda Village Project respondents considered the 'design and layout' sub-factors (i.e. unit layout, unit size and sound insulation) in their own living unit as important 'to a large extent'.

Graph 2 presents specific unit design aspects, including the size of the unit (87%), sound insulation in the unit (77%), the layout of the unit (74%) and finishes in the unit (74%) that were also rated as important 'to a large extent' by a majority of the respondents.

The quantitative findings were also supported by the following comments by the Amalinda Village Project respondents, as highlighted in the qualitative analysis:

> *"This type of housing is fine, but it should be built closer to towns, the people feel as if they are still excluded."* (Female respondent, aged 33)
>
> *"Carpets, cupboards should be standard…Ventilation and sound insulation not at all adequate."* (Female respondent, aged 35)
>
> *"Building material should be of higher quality, otherwise they in any way just end up being repaired and fixed the whole time."* (Female respondent, aged 24)

Graph 2 also presents specific unit design aspects, including the size of the unit (87%), sound insulation in the unit (77%), the layout of the unit (74%) and finishes in the unit (74%) that were also rated as important 'to a large extent' by a majority of the respondents.

The quantitative findings were also supported by the following comments by the Sakhasonke Village Project respondents, as highlighted in the qualitative analysis:

> *"The bus is far and expensive."* (Female respondent, aged 44)
>
> *"I am close to work but my child is far from school. Our transport is cyclical because in the morning there is no transport but in the afternoon it's closer."* (Female respondent, aged 27)
>
> *"Layout of unit is unsafe for kids and elderly people because they fall on the stairs."* (Female respondent, aged 40)

It is interesting to note that although the respondents of the Sakhasonke Village Project seemed not to consider the 'design and layout' sub-factors as important 'to a large extent', they addressed these in the open question section.

5. Discussion

The findings presented above do not show a clear link between the participation of users in the preliminary stages of the developments and their satisfaction with the final development product. Though the quantitative data reviewed assumes that respondents of the Sakhasonke Village Project

did not consider the specific unit design aspects to be important 'to a large extent', it is interesting to note that it both developments, numerous respondents complained about specific unit design aspects.

It is unclear from the research reports, how intense the community participation processes were that took place during the planning and design stages of the Sakhasonke Village Project implementation and to what degree the community was involved in contributing to the design. However, it is evident from resident surveys that residents who have the longest (as depicted by the 'Operation' phase in Figure 5) and most intimate relationship with the end product may be in an ideal position to inform built environment professionals about the performance of the buildings, because generally "the people who procure, design and construct buildings seldom engage closely with the performance of the buildings they have created" (Bordass and Leaman, 2005).

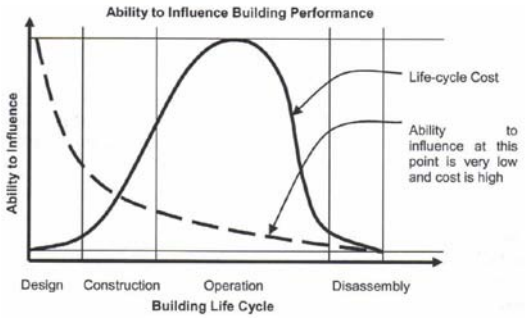


Figure 5: Ability to influence building performance (after Sparrius, 1998 in Conradie and Roux, 2008).

Building analysis is complex, because it needs to be understood as both a human creation and a physical entity. In terms of human creation, designs developed "reflect social concerns, scientific theories and architectural trends" (Assefa *et al*., 2007 in Conradie and Roux, 2008). The physical entity of the building leads us in how we use and experience space and also "influences internal environmental conditions" (Assefa *et al*., 2007 in Conradie and Roux, 2008). The analysis of building performance therefore needs to reflect the performance of the building, "both in terms of human activities and experiences as well as in terms of physical and environmental performance" (Assefa *et al*., 2007 in Conradie and Roux, 2008).

Case studies and post-occupancy evaluations are two of five methods that have been used to evaluate environmental design-related human behaviour within the built environment (Yan and Kalay, 2004 in Conradie and Roux, 2008). Figure 6 shows an integrative framework for building performance evaluation (Preiser and Nasar, 2008). This framework shows how post-occupancy evaluation only represents a sixth of the internal review loops and how the framework not only focuses on the entire life of the building, but also on the notion of "feed-forward" into the next building cycle" (Preiser and Nasar, 2008).

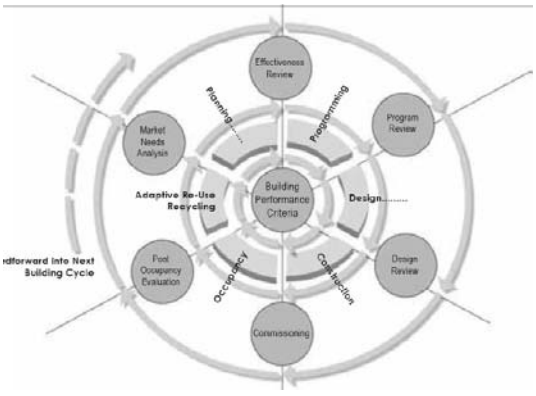


Figure 6: Building Performance Evaluation (BPE) Process Model.

These systematic assessments and feedback loops are an essentially powerful mechanism for learning from our buildings, as this ensures that mistakes are avoided and information from current

projects used to feed into and improve the life cycle of the next building (De Jager, 2007). This is in line with the concept of systems engineering, which is about creating effective solutions to problems and managing the technical complexity of the resulting developments. Systems engineering is from the onset a creative activity, defining the requirements and the product to be built (Stevens *et al*., 1999:5 in Küsel, 2000:12). Figure 7 presents the systems engineering process which aims to achieve "time to market the right product", where right in this instance refers to "what users really want (Stevens *et al*., 1999:5 in Küsel, 2000:12). This methodology's emphasis is therefore to deliver the right product to the customer in order to achieve business success (Stevens *et al*., 1999:5, cited in Küsel, 2000:12).

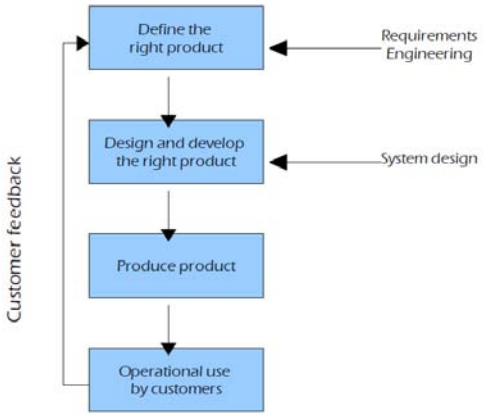


Figure 7: Time to market the right product (systems engineering).

This discussion suggests that community participation should not only take place at the commencement of a development, but also when the end product has been developed. Although users may not always have the answers to design solutions at the beginning of a project, they hold the most relevant experience in terms of the building's performance in the operational stages of the building's life cycle. This experience and knowledge should not only be acknowledged, but the possibilities of how this may be used to improve the housing environments should be explored by built environment professionals and researchers.

6. Conclusions

The Amalinda Village Project does not appear to have had any community participation during the early phases of the development, whilst the Sakhasonke Village Project included community participation by obtaining the view of residents from neighbouring communities. Although the Sakhasonke Village Project residents were involved (by proxy), from comments made by respondents, they appear to have had more dissatisfaction with their immediate environment than those of the Amalinda Village Project.

The paper suggests that there are aspects of the MDMH developments that require improvement and that as the stakeholders with the most intimate use of these environments, residents may hold some of the answers to these improvements. This may be done in the form of feedback processes that ensure the professional team learns from the experience of occupants about the performance of the completed building.

The paper suggests that the following areas for further research are required:

- Researching the link between community participation (at either the commencement or conclusion of the project) and user satisfaction, possibly through the use of post-occupancy evaluations and/or case studies, in order to better understand the impact of MDMH developments on the communities they are developed to serve.
- Explore possibilities of how the residents' experience and knowledge may be used to improve the housing environments.

References

Assefa, G. et al., 2007. Environmental assessment of building properties–Where natural and social sciences meet: The case of EcoEffect. *Building and Environment*, 42(3), 1458–1464.

Bordass, B. & Leaman, A., 2005. Making feedback and post-occupancy evaluation routine 3: Case studies of the use of techniques in the feedback portfolio. *Building Research & Information*, 33(4), 361–375.

Conradie, D.C.U. & Roux, E., 2008. Quality management in construction project design and management. In *5th Post Graduate Conference on Construction Industry Development, Bloemfontein, South Africa*. pp. 16–18.

Dempsey, N., 2008. Quality of the Built Environment in Urban Neighbourhoods. *Planning Practice and Research*, 23(2), 249-264.

de Jager, P., 2007. Toolkit for healthcare facility design evaluation-some case studies.

Landman, K. et al., 2009a. *Medium Density Mixed Housing in South Africa: the case of Amalinda*, Pretoria: CSIR.

Landman, K. et al., 2009b. *Medium Density Mixed Housing in South Africa: the case of Sakhasonke*, Pretoria: CSIR.

NDH, 2004. *New Comprehensive Plan for the Creation of Sustainable Human Settlements*, Pretoria: National Department of Housing.

Preiser, W.F. & Nasar, J.L., 2008. Assessing Building Performance: Its Evolution from Post-Occupancy Evaluation. *Archnet IJAR*, 2(1), 84-99.

Yan, W. & Kalay, Y.E., 2004. Simulating the Behaviour of Users in Built Environments. *Journal of Architectural and Planning Research*, 21(4), 371.