REGENERATIVE SUSTAINABILITY IN SOUTH AFRICA THROUGH MIXED IN-COME HOUSING DEVELOPMENT
Regenerativna održivost stambenog razvoja u Južnoj Africi kroz mešvote prihode

Thwala D. Wellington
Department of Construction Management and Quantity Surveying, University of Johannesburg, Doornfontein in Campus, Johannesburg, South Africa

Aigbavboa O. Clinton
Department of Construction Management and Quantity Surveying, University of Johannesburg, Doornfontein in Campus, Johannesburg, South Africa

Abstract

The provision of adequate and regenerative sustainable housing remains a key priority for the South Africa government. The South African Government has since 1994 initiated and implemented several housing delivery programmes and subsidy mechanisms to eliminate the incidence of ‘slum housing’, its associated poverty and destructive effect to the ecological environment. This include the mixed housing programmes which has been allude to have positive social impact and the potential for interaction between different social spheres and income groups, reduction of negative area effects (for example, low aspirations and low-level crime), a mix of different people from various backgrounds in the local community, attracting and supporting a higher level of services, provision for a change in household composition in one neighbourhood and the creation of additional employment opportunities through higher disposal income in the area. All this attributes steams from the fact that sustainable housing and environmental development requires a new understanding to effectively and synergistically address the pressing issues of sustainability which include climate change. In South Africa, housing development is no longer regarded as simply ‘a roof over one’s head’, but housing development is seen as a crucial role player in achieving regenerative sustainable development – as envisaged by the idea of sustainable housing. Hence this article aims to reveal the effectiveness of the mixed-income integrated development programme, and to access how the programme create sustainable regenerative environment for the occupants of the mixed-income housing. The data used in this article were derived from both primary and secondary sources. The primary data was obtained through the survey method, while the secondary

Kontakt autora: caigbavboa@uj.ac.za. Autori izjavljuju da značajne nemaju materijalne ili finansijske interese koji se odnose na istraživanje opisano u ovom radu. Takođe, autori izjavljuju da je podneti članak njihov originalan rad i da nakon izdavanja ništa od sadržine neće predstavljati povredu autorskog prava. Rad primljen 30.09.2015. godine. Odobren za objavljivanje 10.11.2015. godine. The authors declare that they have no relevant or material financial interests that relate to the research described in this paper. Also, the authors declare that the submitted paper is their original work and that, upon publication, nothing contained in it will not constitute an infringement of any copyright. Paper received 30.09.2015. Approved 10.11.2015.
data was derived from the review of literature. The primary data for the study was collected through a structured questionnaire survey distributed to a sample of 80 mixed-income households in Fleurhoff in Johannesburg Metropolitan Municipality in the Gauteng Province of South Africa. Findings from the questionnaire survey revealed that the programme makes better environment and has been effective through the creation better neighbourhood, urban revitalization and improvement of the occupants’ quality of life. The article closes with recommendations on how mixed-income housing can be better adapted to support the regenerative sustainability process and the improvement of the human environment.

Keywords: Regenerative sustainability, mixed-income housing programme, sustainability, South Africa

1. Introduction

Housing delivery programmes and practice can make a significant contribution to sustainable development of urban areas and can also detract from sustainable development (SD) of urban areas when not properly aligned with known construction practices. This importance was first recognized in the report of the World Commission on Environment and Development and in the global action plan for SD, Agenda 21. However, housing and its regenerative ability are relatively neglected topics in the SD literature with a few exceptions (Huby, 1998; Bhatti, 2001; Tosics, 2004; Hall & Purchase, 2006; Williams & Dair, 2007). Winston (2008) informs that various aspects of housing can have significant negative impacts on the environment, including its location, construction, design, maintenance, management, use and eventual demolition. In addition, there are ecological limits to the key inputs to housing, namely land and many non-renewable construction materials. Also, these inputs along with various outputs from housing can be significant pollutants to the ecosystem when there are no proper plans through government housing delivery programmes to intervene in some ways. This article is aimed to reveal/study the effectiveness of the mixed-income integrated development programme, and to access how the programme creates sustainable regenerative environment for the occupants of the mixed-income housing in Johannesburg, South Africa. In the South Africa context, previous housing policies and practices have resulted in unsustainable trends. The regeneration of existing neighbourhoods (‘locations’- as previously defined by the deformed apartheid government) is required to offset much of the resulting damage. Typical features of sustainable housing (SH) as embedded in the mixed-income housing programme used in the development of low-income housing in Johannesburg include: sustainable land-use planning; resisting scattered settlements; mixed-use developments; encouraging housing development close to employment and public transport; promoting higher residential densities (inner city redevelopment); sustainable construction and design; sustainable use, management and maintenance of buildings; high building and neighbourhood quality; access to green space; attractive, clean and safe residential environment; affordable; tenure and social mix; and access to social resources (Winston, 2005; 2008).

However, to a large extent, South Africa housing development programmes and initiatives have been advanced to entrench these qualities as seen from the housing development bundles that has been delivered by the post-apartheid government since 1994. Although most development have tilted towards suburban sprawl on green-field sites, mix-income housing development, and low-density housing, including one-off housing in urban rural areas amongst others. However, in line with global housing
trends to address SD, and especially in an attempt to readdress the patterns of spatial fragmentation and separation in South African cities, current housing policies highlight the need for greater integration through the use of programmes that will respond to regenerative sustainable of the urban areas in South Africa. For instance the South Africa Government’s housing plan (commonly referred to as Breaking New Ground enacted in 2004) specifically emphasises the need for mixed / integrated or inclusionary developments to allow more people greater access to a wider range of socioeconomic opportunities in closer proximity to their living places (Landman, 2012). In reality, however, South Africa faces a number of context-specific challenges in the implementation of mixed housing, such as the tradition of separation and segregated development, and high levels of insecurity that may slow down interventions that are focused on greater integration and diversity, but the programme being made through the deployment of the programme is significant. The next section of the article discusses the concept of regeneration sustainable in housing development followed by a discussion of the South Africa regenerative sustainability housing development. This will be followed by literature on the South Africa mixed-income housing development programme. Thereafter, the methodology adopted for the study is presented followed by the research findings and discussion, before conclusions and recommendations are drawn for the study.

2. Regenerative sustainability in housing development

The most often cited definition of sustainable development (SD) was produced by the World Commission on Environment and Development (WCED), which defined it as development that meets ‘the needs of the present without compromising the ability of future generations to meet their own needs’ (WCED, 1987). SD vision as entailed on the report was economic, social and environmental pillars, a model which have since been extended by adding an institutional or governance pillar (Pareja-Eastaway and Stoa, 2004). SD is often represented as a balance between economy, environment and equity (Berke, 2002). This model is now one of the most common models of SD (Hodge, 1997), and it is utilised by many sustainable housing researchers (e.g. Tosics, 2004; Winston, 2007; Winston and Pareja-Eastaway, 2007).

While relatively little attention is paid to the issue of regenerative sustainability through housing development by researchers, the influence of the WCED report is clear in one case:

When we speak of ‘sustainable housing’ we mean housing that is geared to meeting the needs of the current residents without compromising the ability of future generations to meet their own needs (Priemus, 2005). Despite this, some researchers choose to focus on the environmental aspect to the neglect of the economic and social pillars (Priemus and ten Heuvelhof, 2005; Priemus, 2005). For instance, Priemus (2005) defines sustainable housing as ‘housing with a minimum impact on the environment’. Whilst regenerative sustainable housing is the housing development typologies with minimal impact on the environment, ecosystem, humans amongst others. Scholars such as Brown and Bhatti (2003) and Godschalk (2004) have adopted a more inclusive approach to sustainable housing. For instance, Brown and Bhatti (2003) argue that a sustainable housing system must incorporate social, economic, and environmental sustainability in a mutually reinforcing way.

Perce (2003) defined sustainable regeneration as involving environmental sustainability, economic efficiency and meeting social needs. Also, Percy (2003) argues
that sustainability is a new agenda in urban regeneration, while the aspect of housing influence in sustainability has not been fully explored. However, in Couch et al. (2003) and Raco (2003), studies which refer to examples of regeneration have very little to say about housing, with the exception of Raco (2003) who focuses on the inadequate supply of affordable housing for local residents. The aspect of housing (supply of affordable accommodation) as address by Raco (2003) is one of the housing themes in urban regeneration research. Raco (2003) states that most times, housing developers are reluctant to meet housing demand. As pointed out in his work, social exclusion is created via the rising cost of housing. However, Adair et al (1995) have argued, ‘meaningful and sustainable urban renewal’ requires the provision of affordable housing to attract people back into inner urban areas. This is where regenerative sustainability through the adoption of mixed-income housing development really finds its essence.

The concept of regenerative sustainability (RS) in housing development concedes that humans, as well as their developments, social structures, and cultural concerns, are an integral and indivisible part of the ecosystems. RS in housing studies how humans can participate in the ecosystems through development that create optimum health for both human communities (physically, psychologically, socially, culturally, and economically) and other living organisms and systems (Zari & Jenkin, 2010; du Plessis, 2012; Healey, 2013). Regenerative sustainable housing development is the use of resources to improve society’s wellbeing in a way that builds the capacity of the support systems needed for future growth. Hence, Gabel (2009) states that what sustainable housing development is to traditional housing and economic development, regenerative sustainable housing development is to sustainable development. Regenerative development does not have to be considered at odds with sustainability, rather sustainability principles can be seen as underlying (or sustaining) the ability for regenerative development (Healey, 2013). Regenerative sustainable development builds capacity while sustainability, at best, maintains it. Regenerative housing development ask question such as: “how can we solve current housing problems in such a way that we improve the capacity of the underlying support systems?” How can we meet our housing needs and develop our economy in ways that result in more rain forests, more fertile soils, restocked fisheries, clean and abundant aquifers and streams, a cleaner atmosphere, and even more biodiversity being preserved? Regenerative housing development paradigm questions that after we have met our housing needs for basic life support and the additional goods and services that modern society identifies with the myriad and evolving definitions of the “good life”— how do we do all that in ways that make our life supporting infrastructure even stronger, more resilient and diverse, deeper and more alive than it was before we showed up? That is the challenge we are faced with in the 21st century, not how do we preserve what remains of our dwindling stocks of ecosystem infrastructure (Gabel, 2009; Healey, 2013).

Therefore, Cole et al. (2006) informs that an understanding of the unique and diverse human and non-human elements of each place is a crucial part of regenerative development, which thus results in a deep understanding of the ‘sense of place’- sustainability, and a localised and integrated response to environmental challenges and opportunities. This approach implies that built environments could be designed to produce more energy and resources than they consume, and to transform and filter waste into health giving resources (Jenkin & Storey, 2009). This approach to development was further described by Reed (2007) as ‘building capacity not things’. Hence it can be infer that regenerative sustainable development aims to restore or create
the capacity of eco-systems and biogeochemical cycles (carbon, hydrological, nitrogen etc.) to function optimally without constant human intervention.

Furthermore, Gabel (2009) and du Plessis (2012) posit that regenerative development seeks to increase the efficiency and capacity of our industrial and technological metabolism while providing life-support services and products for the world’s population. Similar to zero emissions sustainability, it seeks to close all the open loops discharging waste into the environment and direct these valuable resources to places in the industrial metabolic system where they can become valued inputs. Overall, RS goal is to reduce waste and close avenues that allow valuable chemistries to flow out of the industrial system into natural systems, where they become known as “pollution” during the development of housing structures for human habitation. However, regenerative sustainable housing development goes further than that. RS is also about relationships between humans and the natural environment, between buildings and their occupants, and between natural and constructed environments (Zari & Jenkin, 2010). Regeneration therefore is a process of engagement rather than a set of outcomes. This process of engagement according to Jenkin & Storey (2009), Zari and Jenkin (2010) and Healey (2013) has significant environmental, economic, social and cultural benefits related to community building and participation. In a nutshell, regenerative sustainable housing development is a positive contributor to the living systems (biotic and human) in which it occurs; is an instrument for achieving true sustainability through creating living systems with the capacity to continuously evolve; and is a source of deeper meaning and significance for all who engage in it (Reed, 2007). Then, the question to be asked will be “can our activities actually improve environmental quality and human well-being?” the response is yes when properly guided and positioned without any form of counter juxtaposition of the development delivery system through the adoption of regenerative sustainable housing development practices.

3. Regenerative housing development in South Africa

Regeneration is commonly used to describe an infinite number of activities across spaces and places which aim to bring about a better future for people and communities. Be it major infrastructure and structural investment, renewing an urban inner city area, refurbishing houses or altering the desires of an ostracised group of people, this is all termed regeneration (Glossop 2008). Likewise, the International Federation of Arts Councils and Culture Agencies (2006) suggests that regeneration is the renewal, revival, revitalisation or transformation of a place or community. It is a response to decline, or degeneration which could have happened because of some deliberate action. Regeneration is both a process and an outcome. It can have physical, economic and social dimensions; however, the three commonly co-exist since no meaningful form of regeneration can exist without a physical transformation of the environment in conjunction with economic transition and social change (Thwala & Aigbavboa, 2013). When a typical regeneration agenda is considered in its original form, the potential outcomes are multi-faceted, as the outcomes could lead to: development of the built environment through mixed-income (use) housing patterns, ditto through informal settlement upgrading of core slum areas; personal and community health; increased opportunities; increased equality; increased community safety; increased quality of life; increased social inclusion; lifelong learning; community development; and economic and sustainable development (Thwala &
Aigbavboa, 2013). In addition, regeneration is a process of land redevelopment in areas of previous moderate to high density urban land use, related to the development level of each country (Dimopoulou, 2009). In South Africa, regeneration projects revitalize city centres and other high spot areas through the implementation of mixed-income housing types, upgrading of informal settlements, and implement initiatives to improve the quality of the environment and promote a return to the city. Moreover, regeneration’s effect on housing renewal and infrastructure is a subject of intense debate, since it involves the relocation of people in the case of informal settlement upgrading, and the reclaiming of private property in the case of city-initiated development projects.

Moreover, one of the primary aims of regenerative housing development in South Africa is to establish an enabling and profitable environment in areas that have seen substantial decay and decline, to uplift neighbourhoods in previously disadvantaged areas (Reid 2010) and – most importantly for South Africa – the development of mixed-income housing for different class of people in the society. Regeneration of the environment in the new South African state has been on integrated housing development /rebuilding cities, upgrading informal settlements and creating infrastructure to adequately integrate human and economic activities. Hence, this has escalated the development of targeted strategies and interventions that facilitate public infrastructure development as a means of improving these environments and leveraging private sector investment (Thwala & Aigbavboa, 2013).

Housing regeneration in South Africa has focused on improving physical deterioration and maximizing housing development rather than on only strengthening the social capital of low-income neighbourhoods through the housing delivery mechanisms in place. Despite the progress made by the South African government in the adoption of regenerative sustainable development principles, the implementation of sustainable housing and regeneration in South Africa can be further facilitated in a number of ways. First, housing and regeneration policy needs to place more emphasis on: brown-field rather than green-field development; sustainable construction, design and use; renovation rather than demolition; and ‘partnership’ with residents which cannot be over looked in the South African state because of the past policies of exclusion for a majority of the citizens in development issues. These issues must be highlighted as important concerns for South Africa housing stakeholders. In particular, regeneration plans must emphasise each of the social, economic and environmental pillars that are essential to the sustainable redevelopment. Most regeneration approaches seem to focus on improving and extending the physical rather than the natural or social environments. In areas of significant social disadvantage, regeneration projects have involved, and continue to involve, the demolition of the worst informal developments when the causes of many of the problems are social rather than physical. In addition to improving the physical environment, social resources and processes are essential for the creation of viable and coping communities (Thomas, 1991). This requires not just the provision of community facilities but also supplying a range of social supports such as education and training, childcare, assistance with childcare costs) to build a socially inclusive and sustainable community as the inclusionary mixed-income development is current providing in the new South Africa state.

4. South Africa Mixed-income housing

The South African housing policy framework as reflected in the various national legislation, policies and regulations has been regarded as progressive. This is because
the policy framework has resulted in the delivery of millions houses across the country in the urban and rural centres. The current housing policy framework has to an extent succeeded in promoting mixed-income housing development in South Africa as evidence has shown. Mixed-income housing is one in a range of housing instruments (rental housing, project linked housing and others housing programmes) adopted by the South Africa government to address access to housing and integration of communities across incomes groups in the country. The concept of mixed-income housing programme is quite slippery and has been used by many developers, policy makers and commentators to refer to different processes, outcomes and sanctions. The phrases “mixed-income housing programme” is also known as “inclusionary housing programme”, “affordable housing programme” and “inclusionary zoning” in South Africa. Mixed-income housing in many countries, is one of many different kinds of housing delivery programs. It is usually a government driven program to promote mixed-income housing delivery through regulations and/or incentives that require or encourage property developers to include a proportion of housing units for low and moderate. Discussions on mixed-income housing in South Africa started in 2005, at the Housing Indaba in Cape Town. As a result of talks on the topic, a Social Contract for Rapid Housing Delivery was crafted. This contract stated that every commercial housing development not aimed at very low-income groups would have to allocate a certain percentage of units to those who qualify for government housing subsidies (Mokonyane, 2007). The initiative to promote mixed-income housing delivery in South Africa is being pursued at national and provincial levels, as well as in the local authorities’ level.

Mixed income housing world-wide is broad and encompasses many types of dwellings and neighbourhoods. Mixed-income housing is a deliberate effort to construct multifamily development that has the mixing of income groups as a fundamental part of its financial and operating plans (Brophy & Smith, 1997). A new, constructed mixed income housing development includes diverse types of housing units, such as apartments, town homes, and/or single-family homes for people with a range of income levels. Mixed income housing may include housing that is priced based on the dominant housing market (market-rate units) with only a few units priced for lower-income residents, or it may not include any market-rate units and be built exclusively for low- and moderate-income residents (Joseph, Chaskin, & Webber, 2007). Mixed income housing is a South African socio-economic policy framework implemented by the South Africa Department of Human settlement. The policy principle as set out in the White Paper on housing aim to provide households basic services such as potable water and sanitation on an equitable basis. The Mixed-Income Housing Policy in South Africa, (Department of Housing, 2007) is defined as a means to harness private initiative in its pursuit of housing delivery to middle/higher income households and to also provide (include) mixed-income housing programme opportunities in order to achieve a better socio-economic balance in residential developments and also contribute to the supply of mixed-income housing programme/development. Mixed income housing is one of two primary mechanisms to eliminate neighbourhoods of concentrated poverty, combat residential segregation, and avoid the building of public housing that offers 100% of its housing units to those living in poverty. Mixed income housing is built through federal, state, and local level efforts and through a combination of public-private-non-profit partnerships. Mixed-income housing leads to socio-economic balance based on the philosophy of design.
The interpretation of what is meant by a ‘mixed development’ can vary, based on the type of mix, whether housing or tenure types, a mix of income groups or a larger socio-spatial mix through all of the aforementioned, including a mix of social groups and land uses. People often use these concepts interchangeably, including mixed tenure, mixed income and mixed communities. In addition, mixing can take place on different scales, at one site and/or in an entire larger urban neighbourhood. Mixed developments vary greatly in South Africa and comprise a mix of housing or building types, tenure types and land uses, accommodating a mix of income and social groups. Mixed income housing is one the primary mechanisms by the South Africa government to eliminate neighbourhoods of concentrated poverty, combat residential segregation, and avoid the building of public housing that offers 100% of its housing units to those living in poverty. It is paramount to note that the built environment does not solely comprise buildings, infrastructure and public spaces; it also includes human community and cultural experiences. The relationship between these components influences how the built environment develops over time and contributes to creating a ‘sense of place’. The ‘sense of place’ is the character or essence of a location, comprising all features whether they are natural or constructed which is the essence of the mix-income housing development programme.

5. The Rationale for Mixed-Income Housing in South Africa

The South Africa’s urban landscape still suffers from the spatial legacy of Apartheid and its other many problems that came with the end of the apartheid legacy. These problems need to be addressed in order to reshape the cities (Verster, 2007). Issues such as unemployment, rapid urbanisation and an expanding population are problems which affect the provision of housing, and the South Africa cities (National Department of Housing, 2008). Hence, the development of low-income housing in the first few years freedom were marginalised to the outskirts of cities, while the rich control the economic centres. High walls, gated communities and security estates are the typical physical expression of the fear of crime in South Africa, and result in further social exclusion (Verster, 2007). Furthermore, Verster (2007) informs that South Africa’s economy is split in two – the ‘first economy’, is a globalised, first-world economy, and the ‘second economy’, is a third-world economy, mostly supported by the government. These two economies are separated by steep income cliffs (UCT Development Policy Research Unit, 2008).

The two main objectives for introducing mixed-income housing programme are to increase the local supply of affordable housing and to counter segregationist urban planning policies in order to create more integrated and inclusive neighbourhoods (Ray, 2001). These are done by bringing together a mix of income groups, which in many instances also translates into a mix of different racial groups. Mixed-income housing, especially in the South African context, however is not able to provide affordable housing to very low-income households, especially not at the kind of scale which is required in South Africa (Smit & Purchase, 2006). However, the potential of mixed-income housing programmes to bring about greater social and economic integration warrants a further and more in-depth investigation of this policy instrument.

The literature on mixed-income housing (Lewis, 1961; Gray, 1999; Berube, 2006) points out that the rationale for mixing individuals from different income groups in one residential development is that it has specific social spinoffs. For instance, it results in a “de-concentration of poverty” (Schwartz & Tajbakhsh, 1997). A
concentration of poverty in human settlements has severe social costs. According to the Joseph Rowntree Foundation (2005), research studies from both the United States and the United Kingdom indicate that concentrated poverty limits opportunities for people above and beyond their own personal circumstances as it reduces local private sector activity, limits local job networks and employment ambitions, exerts downward pressure on school quality, stimulates high levels of crime and disorder and exacerbates health inequalities. Since housing is more than just shelter as it determines an individual’s access to other services and facilities like schools, clinics, job opportunities, shops, amongst others. Hence, the location of housing ultimately defines the geography of opportunity. Likewise, Calavita (2004) informs that mixed-income housing has the potential to address negative social factors by putting low-income families closer to economic opportunities thereby reducing the mismatch between available jobs and housing supply. Hence putting low-income households’ closer to work opportunities also has positive spin-offs for the economy. For instance the 2006 State of the Cities Report, informs that low-income families in South Africa’s major cities spend up to 58% of their income on housing and 23% on transport. Therefore, providing affordable housing to low and moderate income families closer to their places of work will ensure that they have more disposable income which they can use to pay for goods and services which in turn will stimulate local economic development (Brunick, 2004). With the reduction in energy consumption through the burning of fossil fuel which contributes to the accumulation of greenhouse gas emission and other health issues on the society, the housing delivery programme thus assist to cultivated regenerative sustainability principles and making of better environments.

6. Methodology

The data used in this paper were derived from both primary and secondary sources. The primary data was obtained through the survey method, while the secondary data was derived from the review of literature and archival records. The primary data for the study was collected through a structured questionnaire survey distributed to a sample of 80 mixed-income households in Fleurhoff in Johannesburg Metropolitan Municipality in the Gauteng Province of South Africa. These were all randomly selected amongst other households. These households had all benefited from the government housing subsidy scheme where the housing delivery programme was used. The questionnaire was administered to the head of households or their spouses. One household head per house was engaged in the interview/questionnaire administration. The respondents were randomly selected from the areas in Fleurhoff visited; these were interviewed based on the fact that they have been resident in the areas for more than a month and likewise the houses have been allocated to them for more than one month. All households from each location had an equal chance to be drawn and to occur in the sample. All completed and allocated mixed-income housing units in Fleurhoff were chosen as the sample frame. A total of 80 households were chosen in the entire location for the research, making the overall sample size to be 80 households. This was achieved as follows: each location was divided into 10 regions using the streets, with each region containing 50 houses. A systematic sampling was then applied through the selection of every 10th house in each region; for easy identification of the 10th house, house numbers were used to calculate the number of the next 10th house. This process was essential to obtain true representation of the entire sample. Out of the 80 questionnaires sent out, all 80 were returned representing a 100% response rate.
Because the sample for this study is relatively small, the result analysis was combined for all categories of mixed-income housing in order to obtain a significant results. The data was analysed by calculating frequencies and the mean item score (MIS) of the rated factors. The calculation of the MIS is explained in the next section. The research data was collected between the months of August to October, 2013. The questionnaire was designed based on the information gathered from the review of literature and does not form part of an existing survey instrument.

7. Mean Item Score (MIS)

A five point Likert scale was used to determine the respondents’ level of agreement on the effectiveness of the mixed income housing programme. The adopted scale was as follows:

1 = Strongly disagree
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly agree

The five-point scale was transformed to a Mean Item Score for each of the factors of causes and effects as assessed by the respondents. The indices were then used to determine the rank of each item. These rankings made it possible to cross compare the relative importance of the effectiveness of the programme as perceived by the respondents. The MIS was based on previous studies as conducted by Aibinu and Jagboro (2002) where the ‘MIS’ rating was used. This method was also adopted to analyze the data collected from the questionnaire survey.

The computation of the MIS was calculated from the total of all weighted responses and then relating it to the total responses on a particular aspect. This was based on the principle that respondents’ scores on all the selected criteria, considered together, are the empirically determined indices of relative importance. The index of MIS of a particular factor is the sum of the respondents’ actual scores (on the 5-point scale) given by all the respondents as a proportion of the sum of all maximum possible scores on the 5-point scale that all the respondents could give to that criterion. Weighting were assigned to each responses ranging from one to five for the responses of ‘strongly disagree’ to ‘strongly agree’. This is expressed mathematically below. The relative index for each item was calculated for each item as follows, after Lim and Alum (1995):

\[
MIS = \frac{1n_1 + 2n_2 + 3n_3 + 4n_4 + 5n_5}{\sum N}
\]  

(1)

Where;

- \(n_1\) = Number of respondents for strongly disagree;
- \(n_2\) = Number of respondents for disagree;
- \(n_3\) = Number of respondents for neutral;
- \(n_4\) = Number of respondents for agree;
- \(n_5\) = Number of respondents for strongly agree;
- \(N\) = Total number of respondents
Following the mathematical computations, the criteria are then ranked in descending order of their relative importance index (from the highest to the lowest). The next section of the article presents the findings of the survey and some discussion.

8. Results and discussion

Socio-demographic profile

The survey result revealed that the majority of the respondents were women representing 62.0% while 38.0% were men. Although the sample was randomly selected, the result showed that there is a predominance of women as owners of mixed-income housing units. This was in line with the promotion of the housing needs of the marginalized and previously disadvantaged women, which shows the responsibility of the South Africa government towards meeting the needs of the marginalized women in providing homeownership to them.

Also, a total percentage of 65.1% respondents are either married or living together with a spouse. However, 34.9% of the housing beneficiaries’ were never married, but they have dependents living with them, which enabled them to meet the qualifying criteria to be allocated a mixed-income housing unit. Also, a total percentage of 80.0% respondents were Black Africans, 2.0% were White and 18.0% were Coloured people of South Africa.

Likewise, the survey findings revealed that all beneficiaries of the housing scheme were South African citizens; because all respondents were born in South Africa. This was in line with the basic requirement of the South African government to qualify as a beneficiary for a housing subsidy. It further shows the government responsibility in providing housing for its citizens. This made through the housing clause on the freedom charter, that “there shall be houses, security and comfort for all… All South Africa citizens shall have the right to be decently housed and to bring up their families in comfort and security”.

Also, the findings further revealed that 12.0% of the respondents are originally from the Mpumalanga Province, 10.0% from the Limpopo Province and 2.0% were from the KwaZulu-Natal Province. While only 52.0% came from Gauteng Province (research survey site). This findings shows why the Gauteng Province has always had the highest number of housing backlog in the country, revealing that most beneficiaries of the mixed-income housing schemes are not necessary from the Gauteng province, from other provinces. Amongst the 80 respondents that answered the question on the beneficiaries’ age group; all respondents were above the age of 20, none were below age 20, which conformed to the mixed-income housing allocation benchmarks, which stated that a beneficiary must be over the age of 20 years to receive a mixed-income housing subsidy.

With regards to the length of stay in the mixed income housing units, findings revealed that 20.00% of the beneficiaries’ have been living in the housing units between 3-5 years. Those who have lived there for more than five years are 55.70% while for a period of 2-3 years is 24.30%. In essence beneficiaries who have lived in their housing units (Fleurhoff mixed income houses) for more than one year completed the questionnaires. It can therefore be inferred that the respondents have adequate knowledge of their living apartments and out-door environment, hence their perceptions on the effectiveness of the mixed-income integrated development programme (houses),
and how the programme create sustainable regenerative environment for the occupants of the mixed-income housing will be a useful notion to inform policy.

**Effectiveness of mixed income housing development programme**

Based on the ranking (R) of the weighted averages, the mean item scores (MIS) for the listed effectiveness of the mixed-income housing programme was assessed (Table 1). The survey findings revealed the most rated effectiveness of the mixed income housing programme are that the programme contribute to clean neighbourhood and urban revitalization (MIS=3.88; R=1); it enhance a better quality of life and bring together diverse cultures (MIS=3.82; R=2); it also contribute to safer communities (MIS=3.60; R=3) as revealed by the respondents; it offers a better physical condition and that the programme promote better appearance of neighbourhood (MIS=3.46; R=4).

<table>
<thead>
<tr>
<th>Effect</th>
<th>MIS</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean neighbourhood</td>
<td>3.88</td>
<td>1</td>
</tr>
<tr>
<td>Urban revitalization</td>
<td>3.88</td>
<td>1</td>
</tr>
<tr>
<td>Enhance quality of life</td>
<td>3.82</td>
<td>2</td>
</tr>
<tr>
<td>Diverse cultures</td>
<td>3.82</td>
<td>2</td>
</tr>
<tr>
<td>Safe community</td>
<td>3.60</td>
<td>3</td>
</tr>
<tr>
<td>Offers a better physical condition and appearance of the neighbourhood</td>
<td>3.46</td>
<td>4</td>
</tr>
<tr>
<td>Promote diverse social mix</td>
<td>3.42</td>
<td>5</td>
</tr>
<tr>
<td>Enhance occupants well being</td>
<td>3.32</td>
<td>6</td>
</tr>
<tr>
<td>Offers a range of public services</td>
<td>3.32</td>
<td>6</td>
</tr>
<tr>
<td>Enhance economic inclusion</td>
<td>3.28</td>
<td>7</td>
</tr>
<tr>
<td>Offers a range of private services</td>
<td>3.18</td>
<td>8</td>
</tr>
<tr>
<td>Poverty alleviation</td>
<td>3.02</td>
<td>9</td>
</tr>
<tr>
<td>Proximity to economic opportunities</td>
<td>3.02</td>
<td>9</td>
</tr>
<tr>
<td>Offers range of house size and types</td>
<td>2.78</td>
<td>10</td>
</tr>
</tbody>
</table>

Other aspects which were not highly rated include: promotion of diverse social mix (MIS=3.42; R=5); enhances occupants’ well-being (MIS=3.32; R=6); promotes economic inclusion (MIS=3.28; R=6); poverty alleviation and proximity to economic opportunities (MIS=3.02; R=10). These aspects would have been rated low because the occupants would not have perceived mixed-income housing to promote these aspects, as the current South Africa government have developed and establishes various measures to promote for instance social mix within the citizens, and enhancement of the occupants’ well-being through the creation of jobs and award of social grants where applicable. The current findingsconcurs with works of previous scholars such as Calavita (2004), Reed (2007), Gabel (2009) and Pedersen (2008; 2009) on the characteristics and benefits of mixed income housing to the environment. Further, Pedersen (2009) emphasised that a significant benefit of a regenerative development is the positive outcomes for human society and culture. A regenerative approach such as the use of mixed-income housing positively affects aspects such as cultural identity, satisfaction, and psychological health as displayed by the findings of the current study. This is because a regenerative approach includes people rather than just a small design team in the design and decision-making processes, which contributes to the recognition
of the indivisibility of environmental, economic, social and cultural health. Thus conforming with the work of Winston (2008) that urban regeneration entailing sustainable housing can substantially contribute to the sustainable development of urban areas. Similarly, Williams (2000) states that cities in South Africa reflect the state of the nation and welfare of their people, and because of this, the future for South Africa will be found primarily in its cities. Thus, South African cities through the use of various housing mix- such as the mixed-incoming housing programme are striving for measures that enable them to reach their potential as envision by their national governments (Turok and Parnell 2009). Hence, mixed-income housing (regenerative) development is one strategy that can be used by governments to alter the fabric that constitutes cities. However, regenerative development requires consideration of what that space means to those that occupy it. Fleurhoff is a community in the Gauteng Province that still suffers from the ‘racialized’ planning practices of apartheid and so regenerative (mixed-income housing programme) practices need to be conscious of this history in an attempts to redress these past ills.

Moreover, the literature on mixed-income housing (Gray, 1999; Berube, 2006) points out that the rationale for mixing individuals from different income groups in one residential development is that it has specific social spinoffs such as “de-concentration of poverty” (Schwartz & Tajbakhsh, 1997) and the potential to address negative social factors by putting low-income families closer to economic opportunities thereby reducing the mismatch between available jobs and housing supply. However, these aspects were rated low in the current study by the occupants of the housing development. Also, Schubert and Thresher (1996) informed that mixed-income offers visual integration (cleaner neighbourhood) of development. Whilst, Brophy and Smith (1997) argues that the development contributes to making residents feel equal with one another and unified. These findings reveals that the provision of adequate and regenerative sustainable housing remains a key priority for the South Africa government as the government has since 1994 initiated and implemented several housing delivery programmes and subsidy mechanisms to eliminate the incidence of ‘slum housing’, its associated poverty and destructive effect to the ecological environment.

**Figure – 1: Creation of sustainable regenerative environment for the occupants**

Furthermore, findings on how the programme (mixed-income housing) create sustainable regenerative environment for the occupants, revealed that the occupants (the respondents) largely agreed to this aspect of the study as shown in Figure – 1. However, it was revealed that 22.0% of the respondents’ were neutral to the statement that mixed-
income housing thus creates a sustainable regenerative environment for the occupants. While only 10.0% strongly agreed to this statement. But, 16.0% strongly disagreed to this statement that mixed-income housing creates a sustainable regenerative environment for the occupants.

The currently findings does collaborate the housing regeneration policy in South Africa, as the enacted housing programmes are primarily focused on improving physical deterioration and maximizing housing development rather than on only strengthening the social capital of mixed-income neighbourhoods through the housing delivery mechanisms in place.

9. Conclusions and Recommendations

This study explored the occupants’ perception of the effectiveness of a mixed-income integrated housing development programme, and how if the programme create sustainable regenerative environment for them in Fleurhoff, Johannesburg, Gauteng Province of South Africa. Literature revealed that the main objectives for introducing mixed-income housing programme in South Africa are to increase the local supply of affordable housing and to counter segregationist urban planning policies in order to create more integrated and inclusive neighbourhoods. These are done by bringing together a mix of income groups, which in many instances also translates into a mix of different racial groups. Hence, the development type brings about greater social and economic integration. Whist, primary findings from the study reveals that the programme makes better environment and has been effective through the creation of better cleaner neighbourhood, urban revitalization and improvement of the occupants’ quality of life, integration of diverse cultures, safer communities and offers a better physical condition and appearance of the neighbourhood. Findings also revealed that the occupants’ agreed to the statement that mixed-income housing programme create a sustainable regenerative environment. The empirical study, although based on a relatively small sample of mixed-income housing in Fleurhoff, provides an insight into the government responsibility in providing housing to the citizens and the disadvantaged group in the society; with the less than 5% of its GDP earmarked to overcome its huge housing backlog and fulfil its constitutional obligation.

Despite the progress made by the South African government in the adoption of regenerative sustainable development principles, the implementation of sustainable housing and regeneration in South Africa should be further facilitated in a number of ways. The following are therefore recommended in order for mixed-income housing to be better adapted to support the regenerative sustainability process and the improvement of the human environment:

- Fleurhoff being a community the Gauteng Province that still suffers from the racialized planning practices of apartheid the development of mixed-income houses should be conscious of this history in an attempts to redress these past ills. Hence, the focus of the housing development programmes should not be entire focused predominantly on economic development and capacity building from a top-down perspective, but the involvement of the citizens in order to formulate procedure to redress this ill.

- Housing and regeneration policy needs to place more emphasis on: brown-field rather than green-field development; sustainable construction, design and use;
renovation rather than demolition; and ‘partnership’ with residents which cannot be over looked in the South African state because of the past policies of exclusion for a majority of the citizens in development issues.

- Also, regeneration plans must emphasise each of the social, economic and environmental pillars that are essential to sustainable regenerative redevelopment, as most regenerative approaches seem to focus on improving and extending the physical rather than the natural or social environments.

- In addition to improving the physical environment, social resources the provision of community facilities supplying a range of social supports such as education and training, childcare, assistance with childcare costs to build a socially inclusive and sustainable community is required.

It is believed that the results of this study can be of immense assistance to the housing development policy stakeholders (governments, NGOs, architects etc.), the construction industry and academics. The stakeholders can better understand the effectiveness of mixed-income housing development and the various ways it contributes to urban regenerative development in order to be able to make concerted efforts to reduce the incidents of unsustainable developments thus avoiding the decay of the environment which can result to other dire consequences for the citizens and the global ecosystem. In addition, the construction industry academics can conduct similar studies in other parts of South Africa to understand the contribution of the housing programme development to the urban eco-system amongst others. The study adds to the knowledge on regenerative sustainability in South Africa through mixed in-come housing development in Fleurhoff, Gauteng Province.

References

Adaptive, Restorative and Regenerative Design” course - SDCB 305). The University of British Columbia.


* * * * *

**Apstrakt**

Adekvatne odredbe regenerativnog održivog stanovanja ostaju ključni prioritet za Vlada Južne Afrike. Vlada Južne Afrike je od 1994. godine započela i sproveda nekoliko stambenih
programa i mehanizama subvencije u cilju eliminisanja pojave „sirotinjskog stanovanja“ povezane sa siromaštvom i razornim dejstvom na ekološko okruženje. Ove mere uključuju pomešane stambene programe koji aludiraju da imaju pozitivan društveni uticaj i potencijal za interakciju između različitih društvenih sfera i grupa prihoda, smanjenje negativnih efekata nekih oblasti (npr. niske aspiracije i niskog nivoa kriminala), mešavinu različitih ljudi iz različitih sredina u lokalnim zajednicama, privlačenje i podržavanje višeg nivoa usluga, odredbe za promene sastava domaćinstva jednog naselja i stvaranje dodatnih mogućnosti za zapošljavanje. Svi ovi atributi proizilaze iz činjenice da održivi razvoj životne sredine i stanovanja zahteva novo shvatanje i efikasno i sinergijsko rešavanje gorućih pitanja održivosti koja uključuju klimatske promene. U Južnoj Africi stambenim naseljem se više ne smatra samo „krov nad glavom“ već stambeno naselje ima ključnu ulogu u postizanju regenerativnog održivog razvoja kao što je to i predviđeno idejom održivog stanovanja. Stoga, ovaj članak ima za cilj da otkrije efikasnost integrisanog razvojnog programa mešovitim prihodima. Podaci korišćeni u ovom članku prikupljeni su iz primarnih i sekundarnih izvora. Primarni podaci dobijeni su metodom ankete, dok su sekundarni podaci izvedeni pregledom literature. Primarni podaci za studiju prikupljeni su putem strukturiranog upitnika distribuiranog na uzorku od 80 domaćinstava sa mešovitim prihodima u Feurofu u Johanesburgu, Metropolitan opštini u Gauteng pokrajini Južne Afrike. Nalazi su pokazali da je program uticao na bolju životnu sredinu i da je bio efikasan u stvaranju boljeg naselja, urbane revitalizacije i poboljšanja kvaliteta života stanara. Članak se završava preporukama o tome kako stanovanja u situaciji meštovitih prihoda mogu biti bolje prilagođena procesu regenerativne održivosti i poboljšanja životne sredine.

Ključne reči: regenerativna održivost, programi stanovanja mešovitim prihodima, održivost, Južna Afrika