Sustainable livable housing: A review of what traditional urban areas residents find important

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ABSTRACT

Sustainable livable housing is pre-condition for healthy living, improve quality of life and critical to economic and social survival. It also encompasses various aspects that predominantly depend on economic, social, cultural and environmental (ESCE) conditions within the locality. To this end, this paper seeks to explore, classify and assess the sustainable livable housing attributes from the existing literatures through content analysis. A review of literature revealed a total of ninety two (92) constructs, which were further grouped nine (9) livable housing-related attributes groups. Well-structured questionnaires were administered to residents of traditional urban areas (TUA) of Iwo Osun State, Nigeria with ninety two (92) constructs on Likert scale. Data were analyzed using descriptive statistic and relative importance index (RII). Out of (92) constructs from nine (9) livable housing-related attributes groups, the results identified seventy eight (78) important attributes (i.e. 35 most important and 43 important) across groups and construct that TUA residents found important. Over RII was 0.409 for overall assessment of sustainable livable housing condition by TUA residents indicating that TUA residents are dissatisfied with their current housing conditions.

1. Introduction

Globally, 7.2 billion people (men, women or children) are struggling for their survival in the global economy. The poor among these billions are struggling for basic needs like food, housing, other basic facilities and services needed for bare survival. The poorest among them face daily life and-death challenges of unsafe housing and other basic needs (Sachs, 2015). Despite the fact that living in house that meets one’s needs is a fundamental human right to everyone, Golubchikov and Badyina (2012) reported that decent and safe housing has becomes a dream for majority of urban residents while governments perceive housing as a social burden, especially in most developing nations’ and specifically their urban areas. But earlier studies opined that governments in some developing nations are persistent in their attempts at solving problem of affordable, adequate and sustainable housing provision (Ibem and Amole, 2010; Sengupta and Tipple, 2007; Sengupta and Sharma, 2009; Ademiluyi and Raji, 2008; Akinnmoladun and Oluwoye, 2007; Obeng-Odoom, 2009; Mohit et al., 2010). Figure 1 shows the global housing affordability gap across major cities of the world.

However, quantity of housing provided by various government does not match the prevailing need of the populace. In the existing housing, the prevailing housing living conditions in many African countries is worrisome, consequential and unacceptable. This situation called for all-inclusive approach by all housing stakeholders i.e. governments, private sectors, communities, local authorities, non-governmental organizations, development partner organizations, international communities etc. (Ubale et al., 2013). This all-inclusive approach is in tandem Global Goals - Sustainable Development Goals (SDGs) signed by 193 countries in September 2015 and to be operational till 2030 towards dignity, prosperity, justice, partnership, planet and people. It is also important to note that SDGs are set of time-bound Goals to benchmark the success of both developing and developed countries in meeting their commitments towards 17 SDGs, with performance measured against 169 integrated and indivisible targets. Of these 17 goals with 169 targets, target 11.1 of goal 11 focuses on ensuring access for all to adequate, safe and affordable housing and basic services and upgrade slums in 2030 with a view to make housing livable and sustainable. This led to what constitute livable and sustainable housing

Concept of livability is difficult to define and evaluate (Wheeler, 2001; Balsas, 2004; Heylen, 2006; Throsby, 2005). Relatively, its actual meaning is a function of time, purpose and place of the assessment on one hand and of assessor value system on the other (Pacione, 2003). Also, it is about immediate and tangible conditions and interventions (i.e. now and here) thus more achievable (Ruth and Franklin 2014). Researches have also associated livability concept to many factors like: life quality, safety, health, services accessibility, living cost, comfort, air quality, transport/mobility, living standards, and social involvement (Howley et al., 2009; Bishop and Syme, 1995). Also, livability has also been associated, linked and emerged together with sustainability (sustainable development) as concept by some researchers (Litman, 2011; Lowe et al., 2013). This is why Litman (2011) remarked that livability is a subgroup of sustainability impacts that directly affect people in a community, such as economic development, affordability, public health, social equity and pollution exposure. It is upon this remark that Lowe et al. (2013) submitted that livability is a
subset of sustainability and that no livability attributes is against sustainability criteria and program.

In social science, livability is a classification of happiness. Researches on happiness could be trace to the field of psychology, sociology, economics and health sciences with aims of bring prosperity characterized by happiness and life satisfaction (Veenhoven, 2004). He compares happiness with quality of life which are external (in term of environment and utility of life) and internal (life-ability of the person and satisfaction). This is in agreement with Wheeler (2001); Balsas (2004); (Throsby, 2005) believe that livability covers urban environment features that make urban area pleasing places to live and that such features are tangible and intangible. It is tangible if the feature is real such as availability of facilities, public infrastructures etc. and intangible such as social networks, native/local identity, sense of place etc.

Moreover and as stated earlier, Bishop and Syme (1995); Howley et al. (2009) have associated livability concept to comfortable living standards, life quality, health, safety sense, services accessibility, living cost, comfort, air quality, transport and mobility, living standards, and social involvement. This is in tandem Heylen (2006) who sees livability as environment from individual perspective and subjective evaluation of the quality of the housing conditions in such environment and Setijanti et al. (2015) who opine that it is living/environmental conditions which produce a combination of external opportunities and quality of life. With this understanding, one can consider (Competition and Commission, 2008) submission as a broad definition of livability which define it as community’s wellbeing and features that make it where individuals want to live at present and in future.

In addition, literature on sustainable livable housing (SLH) is scanty and just evolving, as earlier works on livability focus more on community/neighborhood and cities/urban areas. According to Australia (2012), livable houses are dwellings that ensure all occupants’ quality life at all life stages; easily accessible, navigate inside and around; cost-effective and easy adaptation; and occupants’ changing needs responsive. It is, also, define as a safe, aesthetic, socially cohesive/inclusive, and environmentally sustainable place to be; characterized with various affordable housing that is well connected to economic, environment and social (EES) facilities and services such as employment, public open space, community shops, health services, education, leisure/cultural opportunities, other community services as well as accessible through walkways, cycling infrastructure, convenient public transport (Lowe et al., 2013).

To Shared Solution America online (2015), livable homes are homes that maximize successful independent living for all family members that poses no difficulty for all to perform daily living chores and activities with minimal effort and maximal safety. It is built to operate enjoyably, efficiently and economically. It also entails esthetic and functional universal design make homes usable to all regardless of their preference, age, ability, size etc. at every life stages. These definitions and opinions are more of design/ development focus than housing consumption. However, it is not enough for housing to be livable unless it is also sustainable (Musibau et al. 2016. This is why (Chazal, 2010) argued that an area is not truly livable unless it can be sustained over the long term.

Earlier, some studies were conducted on livability and focusing on public housing (Raji et al., 2012; Djebarni and Al-Abed, 2000; Iyanda

![Figure 1: Housing affordability gap across major cities of the world. (Source: Adapted from Habitat, 2015)](source)
and Mohit, 2015; Mohit and Iyanda, 2015; Mohit and Iyanda, 2014),
neighborhood (Leby and Hashim, 2010; Asiyanbola et al., 2012; Yanmei, 2012),
city/urban environment, (Omuta, 1988; Balsas, 2004;
Chaudhury, 2005; Buys et al., 2013; Saitluanga, 2014; Pandey et al.,
2014; Betanzo, 2011). Similarly, some studies were conducted on
sustainable housing in urban area focusing on public housing (Ibem et
al., 2015; Nicholas and Patrick, 2015; Ibem and Azuh, 2011; Otoutah and
Bobadoye, 2011; Tan, 2011), housing production/provision/provision/
development (Van Wyk and Jimoh, 2015; Jimoh et al., 2014; Nicholas
and Patrick, 2015; Jiboye, 2011a; Jiboye, 2011b). However, none of
these studies focuses on traditional urban areas (TUAs) rather they all
focused on public and planned housing areas and its neighbourhood/
environment. This research tends to bridge the gap by exploring
sustainable livable housing attributes from literature and determine
therefrom important attributes to traditional urban areas residents.

2. Exploration of Sustainable Livable Housing Attributes from Literature

Previous studies revealed many attributes of measuring or achieving
livability and sustainability depending on the focus or focuses study.
Table 1 shows identified sustainable housing attributes based on
various livability, sustainability and housing studies. As stated earlier,
many of these studies has housing as an item in measuring livability and
sustainability of neighborhood/community, city/urban environment ,
public housing estate amongst others. However, none of these studies
focuses on traditional urban areas rather they all focused on public and
planned housing areas and its neighborhood/environment. This research
tends to bridge the gap. In this paper, through a comprehensive
literature review, ninety two (92) constructs were identified with nine
(9) livable housing-related attributes for sustainable livable housing
assessment. An attempt was made to use the relative importance index
(RII) method in identifying what traditional urban areas residents find
important.

3. Materials and Methods

From existing literature and preliminary investigation conducted at
the outset of this study, ninety two (92) constructs were identified for nine
(9) livable housing-related attributes for sustainable livable housing
assessment. A questionnaire was then drawn up and was divided into
three sections. Section A sought to know the background of the
respondents (residents), section B focused on housing characteristics
while section C was focused on the nine (9) livable housing-related
attributes for sustainable livable housing assessment. Also, the target
population for this study are traditional urban area (TUA) residents in
Iwo out of nine (9) major urban areas of: Iwo, Ejigbo, Ede and Ikire
(Osun West); Ilesa and Ille-Ife (Osun East) and Ikirun, Ila-Orangun and
Osogbo (Osun Central) recognized by Osun State Government,
Nigeria. Being a pilot survey to an on-going PhD research work, the
study focus on Osun West Senatorial District of the State. To this end,
Iwo was purposely chosen because it is a major traditional urban area
and headquarters of a federal constituencies and senatorial districts in
the State. Unit of assessment is housing unit while household/residents of a
housing unit represent the sample unit.

Moreover, stratified sampling was used on housing unit types or strata
based on 2006 Housing and Population Census of Nigeria that stratified
housing in Nigeria into: (i) house on separate stand or yard; (ii)
traditional/hut structure made of traditional material; (iii) rooms/let in
houses; (iv) informal/improvised dwelling; (v) flat in block of flats; (vi)
semi-detached house; and (vii) others. It is important to state that four
housing strata/types were taken as housing type typical of traditional
urban setting (i.e. house on separate stand or yard, traditional/hut
structure made of traditional material, rooms/let in houses and informal/improvised dwelling) while the remaining three housing
strata/types were taken as housing units found in modern areas of the
urban areas.

Out of 100 questionnaire administered in collecting data from 100
housing units randomly selected across the housing type strata, 93
were returned and devoid of missing and incoherent values which
represents 93%. The respondents were asked to assess ninety two (92)
constructs of the nine (9) livable housing-related attributes for sustainable livable housing assessment through 5-point Likert (of (1= not
important; 2= less important; 3= neutral; 4= important; 5= very
important).

In addition, data were analyzed with descriptive and inferential
statistics specifically Relative Importance Index (RII) was used to
determine most important livable housing-related attributes for
sustainable livable housing assessment. In the literature, RII approach
has been used on various types of studies (Gunduz et al. 2012; Adegoke 2016; Tanko et al. 2017). Respondents (residents) were
investigated with Likert scale so as to determine the relative
importance index (RII) of the ninety two (92) constructs of the nine

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Proponents</th>
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### Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Code</th>
<th>NI (1)</th>
<th>LI (2)</th>
<th>N (3)</th>
<th>I (4)</th>
<th>MI (5)</th>
<th>Sum</th>
<th>RII</th>
<th>Rank within</th>
<th>Rank</th>
<th>Ranking</th>
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</table>

#### Housing Unit

- Living in Urban Area: HU1 11 34 132 32 65 274 0.589 20th 82% N
- Living in crowded Housing Units: HU2 4 36 63 180 25 308 0.662 14th 66% I
- Housing unit too small in size: HU3 1 20 60 140 135 356 0.766 6th 18% MI
- Housing Unit Accessible by Road: HU4 7 12 39 212 70 340 0.731 10th 39% I
- Bathroom in your housing unit: HU5 1 8 54 136 180 379 0.815 1st 8% MI
- Toilet facility in your housing unit: HU6 2 18 84 96 150 350 0.753 7th 25% MI
- Kitchen in your housing unit: HU7 1 14 39 180 135 369 0.794 3rd 8% MI
- Housing unit connected to electricity main: HU8 3 24 153 64 55 299 0.643 16th 75% I
- Independent water source to your housing unit: HU9 3 16 69 140 120 348 0.748 8th 27% MI
- Living in a share housing unit: HU10 9 38 90 84 70 291 0.626 15th 79% N
- Continuing living in the housing unit: HU11 4 24 42 172 100 342 0.715 9th 36% I
- Quality of your housing unit acceptability: HU12 7 36 105 100 40 288 0.619 19th 80% N
- Parking space: HU13 7 40 87 60 110 304 0.654 13th 69% I
- Poor state of repair: HU14 5 18 21 188 125 357 0.768 5th 17% MI
- Nearby clinic/health facilities: HU15 9 36 75 112 65 297 0.639 17th 78% I
- Housing unit enough for no.of people who stay: HU16 4 20 48 196 70 338 0.727 11th 42% I
- Nearness to family or other supports: HU17 3 10 27 188 145 373 0.802 2nd 4% MI
- Nearness to football field/playground: HU18 4 22 42 212 55 315 0.730 13th 46% I
- Nearness to the shops, laundries, and food courts: HU19 6 8 75 172 75 336 0.723 12th 45% I
- Housing unit suitability for the disable/old person: HU20 1 6 51 212 95 365 0.785 4th 11% MI

#### Safety & Security

- Guards at your place/area (day and night): SS1 2 14 42 220 75 353 0.760 4th 20% MI
- Safe walking at night in your area: SS2 4 10 30 200 120 364 0.783 2nd 12% MI
- Living in noisy area: SS3 8 12 57 172 85 334 0.718 10th 49% I
- Trust your neighbors: SS4 6 20 66 140 100 332 0.714 11th 51% I
- People in your place involving in crime: SS5 5 14 57 152 120 348 0.748 6th 28% MI
- Feeling safe where you are living: SS6 6 8 30 148 180 372 0.800 1st 5% MI
- Guards keeping awake at night: SS7 3 20 34 136 140 353 0.759 4th 21% MI
- Availability of fire hose: SS8 4 30 78 112 100 324 0.697 13th 56% I
- Residents in your area involve in drugs: SS9 8 16 66 144 95 329 0.708 12th 54% I
- Residents in your area involve in petty crimes: SS10 4 24 45 180 85 338 0.727 9th 43% I
- Residents in your area involve in house robbing: SS11 1 16 33 224 85 359 0.772 3rd 15% MI
- Residents in your area involve in bag snatching: SS12 5 30 69 132 85 321 0.690 14th 59% I
- Kidnapping cases ever reported around your place: SS13 3 30 42 136 135 346 0.744 7th 31% MI
- Police posts/patrol near/around your place: SS14 7 26 36 116 160 345 0.742 8th 32% MI

#### Healthy Environment

- Waste/rubbish being taken care frequently: HE1 5 16 42 148 145 356 0.766 2nd 19% MI
- Mosquitoes or flies complaint/disturbance: HE2 11 44 93 84 40 272 0.585 6th 83% N
- Clean air quality: HE3 14 76 81 44 15 230 0.495 8th 90% LI
- Living somewhere which is too dirty: HE4 4 24 36 160 125 349 0.751 3rd 26% MI
- Living somewhere which costly to cool: HE5 12 66 105 36 20 239 0.514 7th 88% LI
- Satisfied with electromagnetic (power lines, masts): HE6 0 14 42 200 110 366 0.787 1st 10% MI
- Satisfied with quality of drinking water supply: HE7 14 32 81 100 55 282 0.606 5th 81% N
- Vehicle, industrial & other pollution/disturbance: HE8 5 48 72 104 70 299 0.643 4th 76% I

#### Educational Choice

- Childcare availability: EC1 11 30 63 96 110 310 0.667 3rd 65% I
- Nearness to child’s pre-/primary/secondary schools: EC2 2 22 87 124 100 335 0.720 1st 47% I
- Child use school bus to go into the school: EC3 4 20 30 116 100 340 0.710 2nd 32% I

#### Transportation Choice

- Children schools transportation problems: TC1 6 28 81 96 110 321 0.690 6th 60% I
- Usage of private transportation: TC2 5 56 114 72 20 267 0.574 8th 84% N
- Having A car in your housing unit: TC3 2 18 36 180 125 361 0.776 3rd 13% MI
- Having more than one cars: TC4 45 84 9 12 0 150 0.323 9th 92% NI
- Public transportation usage: TC5 4 12 60 160 115 351 0.755 5th 24% MI
- Housing unit nearness to motor parks/bus station: TC6 5 30 63 188 25 311 0.669 7th 64% I
- Motorcycle easily comes to your housing unit: TC7 7 14 3 172 175 371 0.798 1st 6% MI
- Spending more money on transportation: TC8 2 12 39 244 35 352 0.757 4th 23% MI
- Taxis easily comes to your housing unit: TC9 4 12 112 212 130 370 0.796 2nd 5% MI
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<th>Attributes</th>
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<td>Nearness to markets</td>
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<td>16</td>
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<td>Access/coverage of internet/broadband</td>
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<td>38</td>
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<td>55</td>
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<td>Availability of drainage system</td>
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<td>32</td>
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<td>156</td>
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<tr>
<td>Neighbors helpful</td>
<td>CN1</td>
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<td>12</td>
<td>66</td>
<td>204</td>
<td>65</td>
<td>348</td>
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<td>30</td>
<td>164</td>
<td>160</td>
<td>369</td>
<td>0.794</td>
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<td>1st</td>
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<td>Trust your neighbours</td>
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<td>54</td>
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<td>30</td>
<td>69</td>
<td>168</td>
<td>25</td>
<td>300</td>
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<td>Facing problems with neighbours</td>
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<td>28</td>
<td>57</td>
<td>200</td>
<td>15</td>
<td>307</td>
<td>0.660</td>
<td>6th</td>
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<td>Community club/association</td>
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<td>Being member of any of the association</td>
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<td>36</td>
<td>75</td>
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<td>Place of work near to your housing unit</td>
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<td>3</td>
<td>26</td>
<td>144</td>
<td>80</td>
<td>45</td>
<td>298</td>
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<td>7th</td>
<td>I</td>
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<td>Affording living near to work</td>
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<td>99</td>
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<td>100</td>
<td>316</td>
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<td>5th</td>
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<td>Housing unit price/rent suite your incomes</td>
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<td>22</td>
<td>63</td>
<td>160</td>
<td>95</td>
<td>342</td>
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<td>34</td>
<td>63</td>
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<td>Home nearness to commercial/industrial zone</td>
<td>ED6</td>
<td>5</td>
<td>32</td>
<td>48</td>
<td>172</td>
<td>65</td>
<td>322</td>
<td>0.692</td>
<td>4th</td>
<td>5th</td>
<td>I</td>
</tr>
<tr>
<td><strong>Psychological Impact</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Happiness with where you are living</td>
<td>PI1</td>
<td>4</td>
<td>18</td>
<td>81</td>
<td>100</td>
<td>140</td>
<td>343</td>
<td>0.738</td>
<td>3rd</td>
<td>3rd</td>
<td>MI</td>
</tr>
<tr>
<td>Stressed with where you are living</td>
<td>PI2</td>
<td>6</td>
<td>42</td>
<td>96</td>
<td>44</td>
<td>115</td>
<td>303</td>
<td>0.652</td>
<td>9th</td>
<td>9th</td>
<td>I</td>
</tr>
<tr>
<td>Place is affecting your child’s behavior</td>
<td>PI3</td>
<td>3</td>
<td>48</td>
<td>90</td>
<td>76</td>
<td>85</td>
<td>302</td>
<td>0.649</td>
<td>10th</td>
<td>7th</td>
<td>I</td>
</tr>
<tr>
<td>Ashamed of inviting friends</td>
<td>PI4</td>
<td>4</td>
<td>38</td>
<td>54</td>
<td>124</td>
<td>105</td>
<td>325</td>
<td>0.670</td>
<td>6th</td>
<td>5th</td>
<td>I</td>
</tr>
<tr>
<td>Tensed thinking of your house condition</td>
<td>PI5</td>
<td>0</td>
<td>24</td>
<td>69</td>
<td>140</td>
<td>115</td>
<td>348</td>
<td>0.748</td>
<td>2nd</td>
<td>30th</td>
<td>MI</td>
</tr>
<tr>
<td>Child(s) spend most time outside the house</td>
<td>PI6</td>
<td>3</td>
<td>44</td>
<td>39</td>
<td>172</td>
<td>60</td>
<td>318</td>
<td>0.684</td>
<td>8th</td>
<td>61st</td>
<td>I</td>
</tr>
<tr>
<td>House size affecting child’s growth &amp; well-being</td>
<td>PI7</td>
<td>17</td>
<td>50</td>
<td>99</td>
<td>60</td>
<td>15</td>
<td>241</td>
<td>0.518</td>
<td>13th</td>
<td>87th</td>
<td>I</td>
</tr>
<tr>
<td>Feeling tense &amp; cannot breath because of house size</td>
<td>PI8</td>
<td>4</td>
<td>36</td>
<td>45</td>
<td>172</td>
<td>65</td>
<td>322</td>
<td>0.692</td>
<td>7th</td>
<td>58th</td>
<td>I</td>
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<tr>
<td>Worried over possibility of house robbery</td>
<td>PI9</td>
<td>4</td>
<td>10</td>
<td>48</td>
<td>168</td>
<td>130</td>
<td>360</td>
<td>0.774</td>
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<td>14th</td>
<td>MI</td>
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<tr>
<td>Feeling jittery because of noises and pollution</td>
<td>PI10</td>
<td>15</td>
<td>62</td>
<td>114</td>
<td>28</td>
<td>10</td>
<td>229</td>
<td>0.492</td>
<td>15th</td>
<td>91st</td>
<td>I</td>
</tr>
<tr>
<td>Any changes on your child’s attitude as an outcome of the place you are staying</td>
<td>PI11</td>
<td>6</td>
<td>14</td>
<td>63</td>
<td>144</td>
<td>115</td>
<td>342</td>
<td>0.735</td>
<td>4th</td>
<td>38th</td>
<td>I</td>
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<tr>
<td>Feeling depressed when you heard about the cases of crimes at your place</td>
<td>PI12</td>
<td>7</td>
<td>18</td>
<td>45</td>
<td>168</td>
<td>100</td>
<td>338</td>
<td>0.727</td>
<td>5th</td>
<td>44th</td>
<td>I</td>
</tr>
<tr>
<td>Finding it difficult to live in that kind of house but you have no other choice</td>
<td>PI13</td>
<td>9</td>
<td>46</td>
<td>120</td>
<td>60</td>
<td>30</td>
<td>265</td>
<td>0.570</td>
<td>11th</td>
<td>85th</td>
<td>N</td>
</tr>
<tr>
<td>Worry about your family because of the unsafe house environment</td>
<td>PI14</td>
<td>6</td>
<td>54</td>
<td>120</td>
<td>64</td>
<td>20</td>
<td>264</td>
<td>0.568</td>
<td>12th</td>
<td>86th</td>
<td>N</td>
</tr>
<tr>
<td>Feeling indecisive &amp; think whether to go back home or stay outside all the time</td>
<td>PI15</td>
<td>19</td>
<td>54</td>
<td>99</td>
<td>44</td>
<td>15</td>
<td>231</td>
<td>0.497</td>
<td>14th</td>
<td>89th</td>
<td>I</td>
</tr>
<tr>
<td><strong>Overall satisfaction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Attributes Overall satisfaction</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Code</td>
<td>VD (1)</td>
<td>D (2)</td>
<td>N (3)</td>
<td>S (4)</td>
<td>VS (5)</td>
<td>Sum</td>
<td>RII</td>
<td>Rank</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Overall satisfaction</td>
<td>OSHU</td>
<td>30</td>
<td>64</td>
<td>84</td>
<td>12</td>
<td>0</td>
<td>190</td>
<td>0.469</td>
<td>D</td>
<td></td>
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</tr>
</tbody>
</table>

*Where: NI is not important; LI is less important; N is neutral; I is important; and MI is most important. VD is very dissatisfied; D is dissatisfied, N is neutral, S is satisfied; and VS is very satisfied.*
(9) livable housing-related attributes for sustainable livable housing assessment. The RII was investigated using:

\[ RII = \frac{\sum W}{A \times N} \]

Whereas:
W represents weight given to each factor by the residents (i.e. 1=not important to 5=most important).
A represents highest weight
N represents total number of residents responded.

And a decision rule was adopted in determining the ranges for most important (MI) to not important (NI) using:

\[ RII \text{ Decision Rule} = \frac{(\text{Max} \text{ RII} - \text{Min} \text{ RII})}{A} \]

Please refer to Table 2.

4. Research Findings, Results and Discussion

Tables 2 depicts residents’ ranking of the sustainable livable housing attributes within and among the grouping. The 1st and 2nd most important attributes are nearness to shopping complex (RII=0.838) and nearness to markets nearness to markets (RII=0.817) under public amenities-related attributes. Bathroom within housing unit (RII=0.815) and nearness to family or other supports (RII=0.802) under housing unit-related attributes ranked 3rd and 4th. Feeling safe where you are living under safety & security-related attributes was ranked 5th. Figure 2 showcases pictorial clustered view of the important, neutral, less important and not important attributed.

As evidenced from Table 3, this study revealed six (6) most important SLH attributes groups which include: public amenities-related; housing unit-related; safety and security-related; transportation choice-related; community/neighbourhood-related and healthy environment-related groups. Out of nine (9) SLH attributes groups, educational choice-related attributes, economic development-related attributes and psychology impact-related attributes groups did not fall under the ten (10) most important sustainable livable housing attributes to traditional urban residents.

5. Conclusions

The study has identified ninety two (92) attributes for sustainable livable housing assessment from the literature. It further classified the sustainable livable housing attributes into nine (9) sustainable livable housing-related attributes groups. Out of these nine (9) livable housing-related attributes groups, one is housing unit-related, one is economic development-related, four groups are facilities and services-related (healthy environment, educational choice, transportation choice and public amenities) and three are socio-psychological-related (safety and security, Community/neighborhood, and psychology impact). Of these ninety two (92) attributes from nine (9) livable housing-related attributes groups, the study has also identified seventy eight (78) attributes, from the same nine (9) sustainable livable housing-related attributes groups, that traditional urban areas residents find important.

Figure 2: RII and ranking sustainable livable housing attributes
In TUAs context, nearness to shopping complex and nearness to markets (public amenities-related group), bathroom within housing unit, kitchen within housing unit and nearness to football field/ play ground (housing unit-related group), motorcycle easily comes to your housing unit and taxi easily comes to your housing unit from transportation choice-related group; like your neighbors (community/ neighborhood-related group), satisfied with electromagnetic like power lines, masts, etc. (healthy environment-related group), feeling safe where you are living (safety and security-related attributes) are ten (10) most important sustainable livable housing attributes.

Table 3: Top ten (10) most important sustainable livable housing attributes to traditional urban areas residents.

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Code</th>
<th>Attributes</th>
<th>RII</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nearness to shopping complex</td>
<td>PA5</td>
<td>Public amenities-related</td>
<td>0.839</td>
<td>1st</td>
</tr>
<tr>
<td>Nearness to markets</td>
<td>PA1</td>
<td>Public amenities-related</td>
<td>0.817</td>
<td>2nd</td>
</tr>
<tr>
<td>Bathroom in your housing unit</td>
<td>HU5</td>
<td>Housing unit-related</td>
<td>0.815</td>
<td>3rd</td>
</tr>
<tr>
<td>Nearness to family or other supports</td>
<td>HU17</td>
<td>Housing unit-related</td>
<td>0.802</td>
<td>4th</td>
</tr>
<tr>
<td>Feeling safe where you are living</td>
<td>SS6</td>
<td>Safety and security-related</td>
<td>0.800</td>
<td>5th</td>
</tr>
<tr>
<td>Motorcycle easily comes to your housing unit</td>
<td>TC7</td>
<td>Transportation choice-related</td>
<td>0.798</td>
<td>6th</td>
</tr>
<tr>
<td>Taxis easily comes to your housing unit</td>
<td>TC9</td>
<td>Transportation choice-related</td>
<td>0.796</td>
<td>7th</td>
</tr>
<tr>
<td>Kitchen in your housing unit</td>
<td>HU7</td>
<td>Housing unit-related</td>
<td>0.794</td>
<td>8th</td>
</tr>
<tr>
<td>Like your neighbors</td>
<td>CN3</td>
<td>Community/ neighborhood-related</td>
<td>0.794</td>
<td>9th</td>
</tr>
<tr>
<td>Satisfied with electromagnetic (power lines, masts)</td>
<td>HE6</td>
<td>Healthy environment-related</td>
<td>0.787</td>
<td>10th</td>
</tr>
</tbody>
</table>

(35 most important and 43 important) for sustainable livable assessment of their housing.

(35 most important and 43 important) for sustainable livable assessment of their housing.

This study is a product of pilot survey of an on-going PhD research on Sustainable livable housing for traditional urban areas. The authors wish to thank the anonymous reviewers of the paper for their constructive comments, valuable guidance and advice.

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References:


Li, C., Sun, L. and Jones, P. J. (2012). Liveability of high-rise housing estates: a resident-centered high-rise residential environment evaluation in Tianjin, China. 48th ISOCARP Congress 2012.


