



INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact Factor: 6.078

(Volume 7, Issue 2 - V7I2-1404)

Available online at: <https://www.ijariit.com>

Assessing provision of social amenity sites in peri-urban Bangalore

Shanthala V.

shanthala.v@bmsca.org

BMS College of Architecture, Bengaluru, Karnataka

Dr. Mamatha P. Raj

director@bmsca.org

BMS College of Architecture, Bengaluru, Karnataka

ABSTRACT

The study examines the provision of sites for public semi-public use in residential districts which are emerging as city extensions in the peri urban. The dynamic nature of the peri-urban is incorporated in the methodology of the study where some portions of land is parcelled for urban uses while some parts retain the rural fabric. The existing provision is evaluated with respect to URDPFI Guidelines to assess the level of provision. The number of plots and the area of the plots are considered as criteria to assess the provision. A thematic analysis is conducted for various categories of plots identified. This study examines the adequacy of provision in the context of the method adopted by the local authorities for transformation of agricultural land into urban residential land parcels. The complexities of identifying land for public semi-public use in the peri-urban context is discussed.

Keywords: Public Semi-Public Use; Housing Cluster; Neighbourhood; Amenity Sites

1. INTRODUCTION

Residential extensions are one of the important types of urban land use which intrudes into the peri-urban territory. Provision of planned serviced land in urban peripheries has been very limited (TCPO, 2007) in most Indian cities. In this context, allocating land for public purpose, especially for social amenities is a challenge (Mathews, Pai, Sebastian, & Chakraborty, July 2018). Amenities are important components of a residential district. Amenities are defined as location specific goods or services (Gottlieb, August 1994) which benefit the residents. From an economic perspective, location-specific amenities (Knapp & Graves, 1989) strongly influence the land and labour markets which further affect the population densities. This study investigates the nature of land allocation for social amenities in peri-urban Bangalore and assess the level of provision with respect to regulations currently in force.

The New Urban Agenda (United Nations, Habitat III, October 2016) emphasizes adequate provision of social infrastructure which include amenities for health, education in an inclusive manner. The urban amenities contribute to the quality of life and experiences (Natalie, January 2015) within the urban fabric. Providing amenities at appropriate levels in suitable locations and in response to the socio-cultural context of the settlement is crucial. The provision and location of these social amenities also contribute to vibrance and vitality, safety, security, equity aspects of the settlement. Prioritizing pedestrian movement and weaving positive connections and relations between various facilities through green spaces, squares, streets create identities to residential districts (Manchester City Council, March 2017). These amenities provide opportunities for the community to meet and interact and thus enhance the social health of the settlement.

Local facilities visited on daily basis should be located within 5-15 minutes walking distance i.e., within 300m-800m (Urban and Regional Development Plans Formulation and Implementation Guidelines, January 2015). Accommodating connectivity and accessibility (Brookfield, October 2016) through direct routes, multiple routes to amenity destinations encourage walkability. Sustainable travel modes through connection to public transport networks, walking, cycling are strategies to connect amenity sites to various parts of the settlement. The amenity sites transform as nodes attracting primary and ancillary activities. The location of these nodes with respect to street hierarchy define the blocks for communities to operate. These nodes further improve wayfinding and orientation within the settlement. New residential developments may demand diverse responses from the amenity sites and

hence adaptable to the dynamic nature of the evolving settlement in the peri-urban territory. Inclusive nature of these amenity sites is important for people from varied social, cultural background, age, gender (The City of Red Deer, October 2013) to benefit from these social infrastructure components.

To understand and interpret the amenities, the context is considered as the neighbourhood or the community. The neighbourhood is perceived as a spatial and social construct (Jenks & Dempsey, March 2007). Both these constructs are influenced by the definition of common services within. Communities involve social arrangements beyond the home requiring interdependence of members and boundaries (Jenks & Dempsey, March 2007). Hence it is imperative to understand amenities through their spatial interpretation within the context of the settlement.

Guidelines for Amenity Provision In Various Contexts

The neighbourhood is perceived as a building block of the urban fabric and an appropriate scale to incorporate (Jenks & Dempsey, March 2007) relevant urban policy and planning practices. Various urban administrative bodies have developed guidelines and design standards to be incorporated at the scale of the neighbourhood with respect to the nature of allocation of land for social amenity sites.

Recommendations of the Planning Standards of City of Red Deer (Third largest city in Alberta province, Canada)

The planning standards suggest integrated cluster of amenities such as library, day care, activity centre, school, play areas would assist in facilitating the users to access more than one facility by reaching the node. This would support in cohesive provision, co-ordination and management of these facilities. Further, incorporating amenities along with commercial uses, parks and gathering spaces would facilitate usage of multiple facilities. The transition of these integrated nodes with the residential need to be negotiated through suitable road networks or pedestrian lanes which behave as buffers. The transition may also be achieved through high activity nodes to mixed-use high-density zones to low density residential zones. One or more such community amenity site(s) of size approximately 5250 sqm need to be incorporated in the neighbourhood plan. This may include community uses, day care and adult care, place of worship. Residential use in combination with these community-based uses is permitted. The site may be subdivided also.

Hong Kong planning standards and guidelines for amenities

Hong Kong planning standards and guidelines (Planning Department, The Government of the Hong Kong Special Administrative Region, March 2020) is analysed to compare the standards suggested by URDPFI. The type of facility, threshold population and the areas suggested by the guidelines are enumerated in Table-1.

Various amenities to be provided are referred under various levels in hierarchy of planning units such as local, district, territorial, regional. Social amenities concerning health, education and community facilities are considered for this study at local and district level only since these amenities have an implication on the immediate residential district. The amenity size and the population thresholds considered are enumerated in Table 1. The considerations for these amenity sites in the context of the settlement are also listed.

Table 1. Hong Kong planning standards and guidelines for provision of amenities - Education, Health and Community facilities at local and district level

Sl. No	Amenity Description	Hong Kong planning standards and Guidelines. Recommendations for Numbers and Area			Other considerations as per Guidelines
1	Education Facility	Size of Facility	Area (in sqm)	Threshold Population	Kindergartens need to be accessible without crossing high traffic roads without controlled pedestrian crossing
	Kindergarten	500 half-day & 500 whole-day	Not specified	1000 (Age 3-5 years)	
	Local Facility	6-classroom			Primary and Secondary schools may be provided in clusters.
	Primary school (The standard allows for various sizes of Primary school facility)	1 whole-day classroom for 22.5 persons			
		30-classroom	6200	765 (Age 6-11 years) <i>Approx 16700* Population</i>	Schools shall be free standing with vehicular access but in proximity with community facilities, public open spaces, libraries, community centres, sports facility.
		24-classroom	4700	612 (Age 6-11 years) <i>Approx 13400* Population</i>	
Local Facility	18-classroom	3950	459 (Age 6-11 years) <i>Approx 10000* Population</i>	Location on the type of street is important to avoid traffic congestion	
		1 whole-day classroom for 40 persons			

	Secondary School	30-classroom	6950	1200 (Age 12-17 years) Approx 22600* Population	
	District Facility				
2	Health Centre	Primary health services-	2220	One centre for 100000 persons	Easy accessibility also by public transport, central location, away from noise, pollution, may be in proximity with community facilities.
	District Facility	general health and family health services			
3	Community Halls	1260sqm floor area including a multipurpose hall for 450 people.			Easy accessibility, central location, preferably integrated with other facilities which transform as inclusive nodes for communities
	Local Facility	Provided based on assessment of need- population characteristics and availability of similar such facilities.			
4	Childcare centres	1 for 250 people; Net operational floor area is 530sqm excluding toilets, circulation area, baby care room			Easy accessibility on ground level, preferred proximity to open space or playground, away from noise, air pollution, hazardous sites.
	Local Facility				

In addition to recommended amenity sites, the standards also suggest 10% additional reservation to be applied to accommodate flexibility. Hong Kong planning standards also specify certain other local level community amenities such as study rooms, Integrated Children and Youth Services Centres which may be provided based on local needs.

URDPFI Guidelines for Social Infrastructure

The Urban and Regional Development Plan Formulation and Implementation (URDPFI) guidelines provide a framework to evolve Masterplans and Regional plans for the settlements in the country. It also provides service level benchmarks with respect to various aspects of social and physical infrastructure provision.

The hierarchy in provision of social infrastructure is considered at various levels of planning units as enumerated in Table-2 as per URDPFI Guidelines.

Table 2. Hierarchy of planning units and threshold population according to URDPFI (Urban and Regional Development Plan Formulation and Implementation) Guidelines

S No.	Planning Unit	Threshold population
1	Housing Cluster	5000
2	Neighbourhood	5000-15000
3	Community	1 Lakh
4	District	5 Lakh
5	Zonal	10 Lakh
6	Sub-city centre	25-50 Lakh
7	City	50 Lakh +

The type of amenities and sizes of amenity sites as suggested by the URDPFI guidelines at Housing cluster level and Neighbourhood level are listed in Table 3. The allocation of sites at these two levels has a larger implication in defining the nature of provision in the residential settlement. The amenities for education, health and community facilities, religious places are considered for the study since these comprise amenity provision at Housing cluster level and Neighbourhood level.

Table 3. URDPFI (Urban and Regional Development Plan Formulation and Implementation) Guidelines for provision of amenity sites - Education, Health, Community Facilities at Housing Cluster Level and Neighbourhood Level. Housing Cluster Level (Population 5000)

Description of Amenity	No of Amenity sites	Areas as per URDPFI Guidelines (in Sqm)
Pre-Primary 2	2	800
Primary school (I to V)	1	4000

Aanganwari - Housing area/ cluster	1	200-300
Community Room	1	750
Religious Facility	1	400
Neighbourhood Level (Population 5000-15000)		
Description of Amenity	No of Amenity sites	Areas as per URDPFI Guidelines (in Sqm)
Senior Secondary School (VI to XII)	2	18000
Dispensary	1	800-1200
Community hall, mangalkaryayala, barat ghar/ library	1	2000

Comparing the minimum provision specified in Hong Kong Planning Standards and URDPFI Guidelines, the minimum expected standards is at a higher level with respect to URDPFI Guidelines. In terms of both criteria i.e., no of sites, size of sites, the URDPFI Guidelines suggest a higher level of provision. Hence assessing the level of provision in the study area with the URDPFI Guidelines provides an appropriate benchmark for evaluation. Threshold population for most socio-cultural and educational facilities is based on characteristics of the population and not merely dependent on population numbers. Considering the homogeneity or heterogeneity of the social groups which inhabit the settlement, the provision needs to be assessed.

In the context of certain apex level facilities catering to a larger region beyond the settlement, the guidelines recommend consideration of an additional 25% population. In the context of peri-urban region, the population in surrounding villages may also depend on some of these basic amenities within these urbanized zones and hence consideration of 25% additional population is relevant in this context.

Also, in a peri-urban condition, the new communities locate within the existing rural fabric. Hence the population type is predominantly heterogenous which would demand greater provision of social infrastructure to address the diverse needs of the population inhabiting.

The guidelines strongly recommend walkability to amenity sites as one the primary conditions while providing for local level facilities. The preferred distance of 300-800m is considered optimum within 5-15 minutes of walking distance. This would facilitate pedestrianization and lesser dependence on vehicles and generate walkable neighbourhoods.

2. MATERIALS AND METHODS

The study evaluates the level of provision of social amenity sites in peri-urban Bangalore. A detailed survey of amenity sites is carried out in the identified study area and the provision is compared with the recommended levels as per URDPFI guidelines.

Study Area

The study area of Arishinakunte village is identified in the peri-urban region of Bangalore where the transformation is predominantly in the form of emerging residential extensions. Arishinakunte village is in the North-Western periphery of Bangalore city. Arishinakunte is identified as Census Town according to Census 2011 which implies that the characteristics of the settlement is urban in terms of population, density, and livelihood pattern. It is administered by the village panchayat, the administrative body of rural settlements. This aspect of the identified study area depicts a dynamic transforming fabric in the peri-urban region.

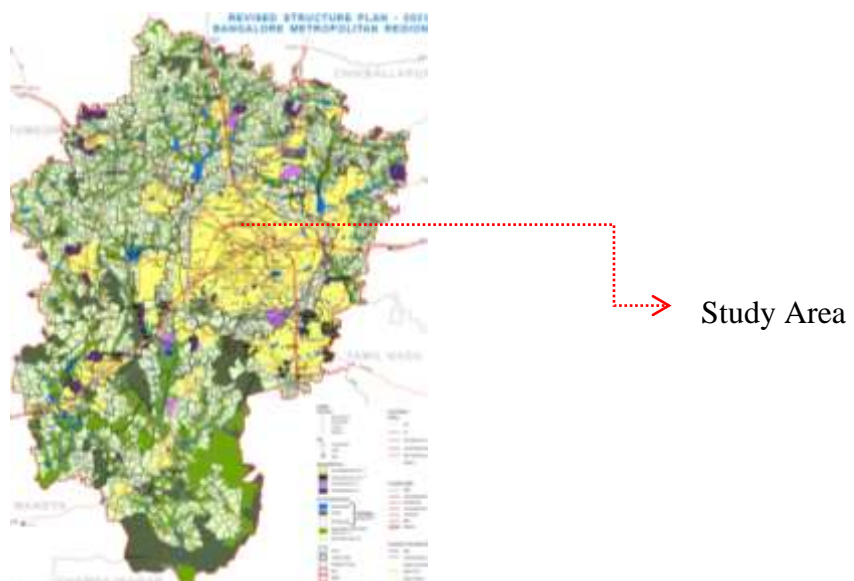


Figure 1. Location of study area in the context of Bangalore Metropolitan Region

Source: Land Utilisation Map of BMRDA Structure Plan 2031

Arishinakunte is located beyond the limits of Bangalore Metropolitan Area (BMA) but shares boundary with the BMA as shown in Figure 1. BMRDA is the Regional Planning Authority which guides the transformation in the Bangalore Metropolitan Region (BMR) through the Structure Plan for the horizon year 2031. The BMRDA has identified 11 Local Planning Authorities within the Bangalore Metropolitan Region (BMR) to regulate urban growth. The Structure plan identifies clusters and nodes which are urbanisable in the Bangalore Metropolitan Region. Arishinakunte is part of one such cluster within the limits of Nelamangala Planning Authority which is the Local Planning Authority. The Nelamangala Planning Authority has a Masterplan for the horizon year 2031 which regulates the urban transformation within its limits.

Arshinakunte village limit encompasses an extent of 5.4 Sqkm (540 Hectares) with a total Population of 10,567 people according to 2011 Census. The National Highway 4 and an arterial road connecting Bangalore to Nelamangala town divide the study area into three sectors as shown in Figure 2.

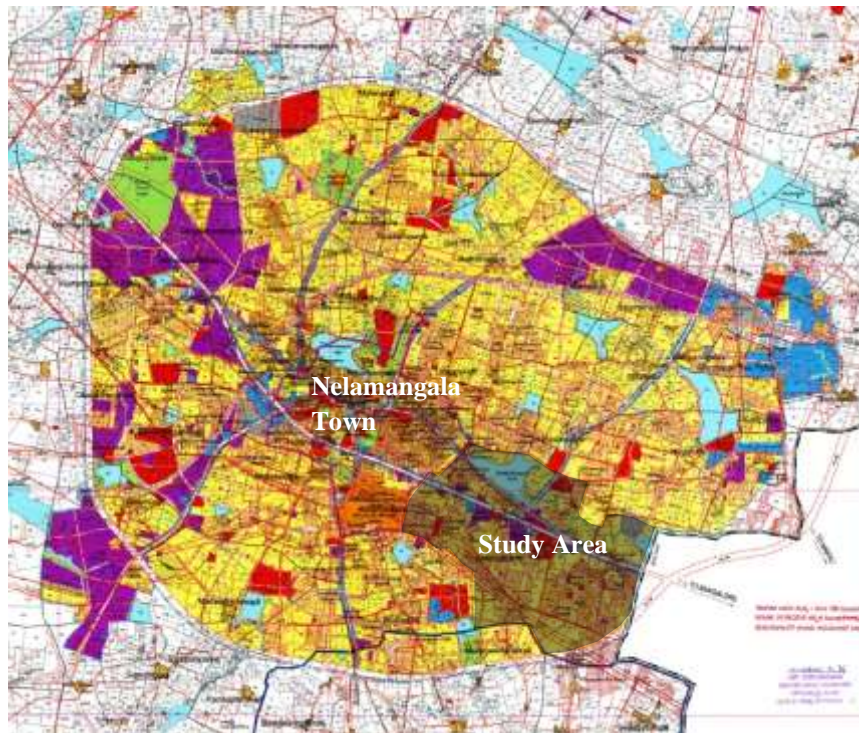


Figure 2. Location of Study area outside Bangalore Development Authority limit and within Nelamangala Planning Authority limits

Background of public semi-public sites in the study area

This peri-urban settlement is transforming from rural agricultural tracts to urban residential land parcels through formation of private layouts. The public semi-public sites are allocated as 5% percent area of every layout approved by the planning authority. These sites are handed over to the local authorities as part of layout approval procedure. The amenity sites are defined and delineated by this process through the formation of layouts. Though, certain parts of the study area are parceled as layouts along with public, semi-public sites, some portions are unparcelled of which some parts are still under cultivation.

A detailed inventory is prepared of all the public semi-public sites within the identified study area. This is carried out by identifying all the public semi-public plots in the Masterplan of Nelamangala Planning Authority. Detailed survey of study area is carried out to identify the sites already accommodating the amenities. All these sites are part of the inventory prepared. The provision in accordance with the Masterplan and the existing conditions on site is compared with the minimum provisions outlined by URDPFI Guidelines to assess the adequacy of public semi-public sites. Hence the sites identified are:

- Sites allocated for public semi-public use according to the Masterplan 2031 of NPA which includes-
 - Sites assigned for public semi-public use through layout formation process and currently vacant.
 - sites assigned for public semi-public use in the Masterplan, which have been identified independent of the layouts formed and are currently used as amenity sites.
- Sites which are not allocated for public-semi-public use in the Masterplan 2031 but currently accommodate civic amenities.

The provision of amenity sites is assessed at the housing cluster level and the neighbourhood level in the hierarchy of planning units of an urban centre as identified by the URDPFI guidelines. These allocations in a residential extension define the basic levels of provision for the settlement to function efficiently. The provision of public semi-public sites for higher level planning units is not considered for evaluation in this study.

It was observed during the field visits that certain sites allocated for public semi-public use in the Masterplan have commercial and residential uses. Hence these non-conforming uses are not included in the total number of sites. Further, since the study involved assessment at the housing cluster level and neighbourhood level, certain higher order facilities (such as training centre, engineering college) provided within the study area were not considered since these facilities are not the primary requirements at the housing cluster level and neighbourhood level.

The other important category of amenity provision at these identified levels of planning units includes commercial uses such as convenience shopping, local shopping centre, bank, ATM. The method of allocation of sites for these commercial activities is specified as 3% of the layout size as per zoning regulations of NPA. The commercial sites are not defined and delineated in the Masterplan or the layout approval plan. Hence the commercial component of amenity provision is not part of the study. Parks and open play areas are not included in the study since these are green spaces of the settlement which are not part of public-semi-public space provision according to the Masterplan. Hence commercial components of amenities along with parks and open spaces are not considered to assess the level of provision of amenity sites.

3. METHODOLOGY

The prevailing condition of amenity site provision in the study area is evaluated with respect to URDPFI Guidelines. Amenity sites for education, community facilities, religious places, health in the lower two levels of planning hierarchy i.e., the Housing cluster level and Neighbourhood level are considered.

Population projection for study area in accordance with BMRDA Structure Plan 2031

The amenity provision is assessed based on the projected population. The Structure plan 2031 of BMRDA has made population projections for the BMR, projecting an average density of 9825 people per sq km within the urbanisable areas. This density is considered for the study to assess amenity provision.

The attributes of the study area considered to assess amenity site provision

The transport networks and percentage land transformed into residential land parcels are important attributes of the study area which define amenity provision and access to the same.

The National Highway and the arterial road which intercept the study area divides the study area into three sectors as shown in Figure 3. The Masterplan also defines certain road networks within the settlement. Since walkability is an important parameter to assess provision, these important transport networks offer impedance to walkability. Hence based on the transport networks defined in the Masterplan, the study area is divided into quadrants as shown in Figure 3.

The transformation from rural to urban patterns is taking place as a continuous process. The entire study area is not parceled as residential layouts. Public semi-public sites are not identified in unparcelled portions of land and hence cannot be considered to assess provision. Hence the quadrants defined and identified by the road networks are categorized based on the extent of land parceled within these quadrants as percentage of total land in each quadrant. Parcelled and unparcelled land is assessed through the Master plan of NPA and satellite images. This was verified by a detailed site survey to prepare the inventory of amenity sites.



Figure 3. Identification of quadrants based on the transport networks and extent of parceled land.

Identifying area categories to assess provision

Considering the minimum area for various amenity sites indicated in the URDPFI guidelines and considering the sizes of amenity plots within the study area, the sites are categorized. The area categories are depicted in Table 4. The amenities which correspond to the area categories and the applicable site limits specified in URDPFI guidelines are noted. Provision for amenities is assessed by considering the sites which are currently in use (as amenity sites) and vacant sites allocated as amenity sites.

Table 4. Area Categories identified for amenity sites as per URDPFI (Urban and Regional Development Plan Formulation and Implementation) Guidelines for Education, Health, Community Facilities at Housing Cluster Level and Neighbourhood Level.

Housing Cluster Level (Population 5000)			
Description of Amenity	No of Amenity sites	Areas as per URDPFI Guidelines (in Sqm)	Area Category
Pre-Primary 2	2	800	500-1000 Sqm
Primary school (I to V)	1	4000	2000-4500 Sqm

Aanganwari - Housing area/ cluster	1	200-300	<500 Sqm
Community Room	1	750	500-1000 Sqm
Religious Facility	1	400	<500 Sqm
Neighbourhood Level (Population 5000-15000)			
Description of Amenity	No of Amenity sites	Areas as per URDPFI Guidelines (in Sqm)	Area Category
Senior Secondary School (VI to XII)	2	18000	>4500
Dispensary	1	800-1200	1000-2000 Sqm
Community hall, mangalkaryayala, barat ghar/ library	1	2000	1000-2000 Sqm

Equivalent provision

The size of amenity sites is an important criterion in assessing the level of provision. For instance, the study area has many places of worship, but the size of sites is nominal. Also, with regard to education facilities, the study area presently has schools but the sizes of plots in many cases are much smaller than the recommended guidelines. In such situations, though the amenity is present, it does not function as effective amenity for the population considered. Hence the amenity sites are represented as equivalents of the sizes recommended in the guidelines. For instance, A religious facility which is 200sqm when compared to 400sqm according to the guidelines is considered as 0.5 equivalent provision.

Similarly, all the sites are given the associated equivalent provision values considering the recommendations of the URDPFI guidelines. The provision is assessed across the study area and compared with the guidelines for adequacy of provision with respect to the projected population.

Discrete Provision

The number of plots is also important which defines whether the sites are limited in number and hence concentrated in some portions of the settlement or is highly fragmented as smaller plots. Hence the number of plots allocated in various area categories is considered as discrete provision since they refer to distinct sites allocated in various parts of the study area irrespective of their size.

4. DATA ANALYSIS

Parameters to assess provision

The data of existing sites in the study area exhibit large dissimilarities across quadrants and when compared to the guidelines of URDPFI. Hence thematic method of analysis is adopted to analyse the prevailing process. The themes identified are assessing provision with respect to area of site i.e., equivalent provision and assessing provision with respect to number of sites i.e., discrete provision.

Considering the networks which segregate parts of the study area and the percentage of parceled land, the quadrants are grouped to assess the provision. The current provision is examined in quadrants where over 75% of land extent is parceled that is quadrants 1-4 and quadrant 10.

The provision is assessed by projecting population within these quadrants and assessing required amenities for only parceled portions of the study area. This is because the allocation of public semi-public sites in unparcelled parts is not defined since the layout plans are not prepared and approved for these areas.

Table 5. Equivalent site provision in the study area within various quadrants and comparison with the URDPFI Guidelines

Description of Quadrants	Area categories of Public Semi-Public plots (Area in sqm)				
	<500	500-1000	1000-2000	2000-4500	>4500
<i>Percentage of land parcellled 75%-100%</i>					
QUADRANT 1-4	5.86	5.90	3.92	0.98	0.00
URDPFI 1-4	7.26	10.88	2.42	3.63	2.42
QUADRANT 10	5.36	1.29	1.05	0.00	0.00
URDPFI 1000-2000	1.78	2.68	0.59	0.89	0.59
<i>Percentage of land parcellled 40%-75%</i>					
QUADRANT 5-7	5.44	3.23	1.59	0.00	1.16
URDPFI 5-7	3.63	5.44	1.21	1.81	1.21
QUADRANT 12	1.45	0.73	1.16	2.66	2.11
URDPFI 12	1.40	2.10	0.47	0.70	0.47
<i>Percentage of land parcellled <40%</i>					
QUADRANT 8,9	0.63	0.86	0.00	0.00	0.00
URDPFI 8,9	0.61	0.91	0.20	0.38	0.10
QUADRANT 11,13, 14	2.02	0.00	0.00	0.00	0.00
URDPFI 11,13, 14	0.56	0.84	0.19	0.28	0.19

Analysis of Quadrant 1-4

The graph in Figure 4 indicates the provision of amenity plots in quadrants 1-4. The discrete number of plots in the existing fabric and the equivalent number of plots arrived through the guidelines is compared with the number of plot provision as per URDPFI Guidelines.

The discrete number of plots in small plot category i.e., less than 500 sqm is considerably high when compared to the equivalent number of plots and the specification in the URDPFI guidelines. This indicates that the provision in the study area is highly fragmented. Smaller fragmented plots will not be effective in accommodating the required amenities even though they account for the overall provision.

Considering 500-1000 sqm category of plots, inadequacy of about 50% is noted with respect to the provision on site and the recommended guidelines. Considering the variation between the equivalent plots and discrete number of plots, though the numbers of plots are less, the plot sizes are larger. The limited number of sites have an implication on spatial distribution of these sites and hence access to the same.

With 1000-2000sqm category, in terms of discrete plots, the provision shows inadequacy. In terms of equivalent number of plots, the provision is higher by which it is inferred that the plot sizes are bigger. In case of these plots also, spatial distribution of plots determines the access. The 2000-4500 sqm category also shows inadequacy. With the existing provision, and with reference to the bar graph in Figure 4, it is observed that the number and the size do not conform to guidelines. The larger plot size i.e., the plots greater than 4500 sqm area are not identified and hence inadequacy in provision is evident.

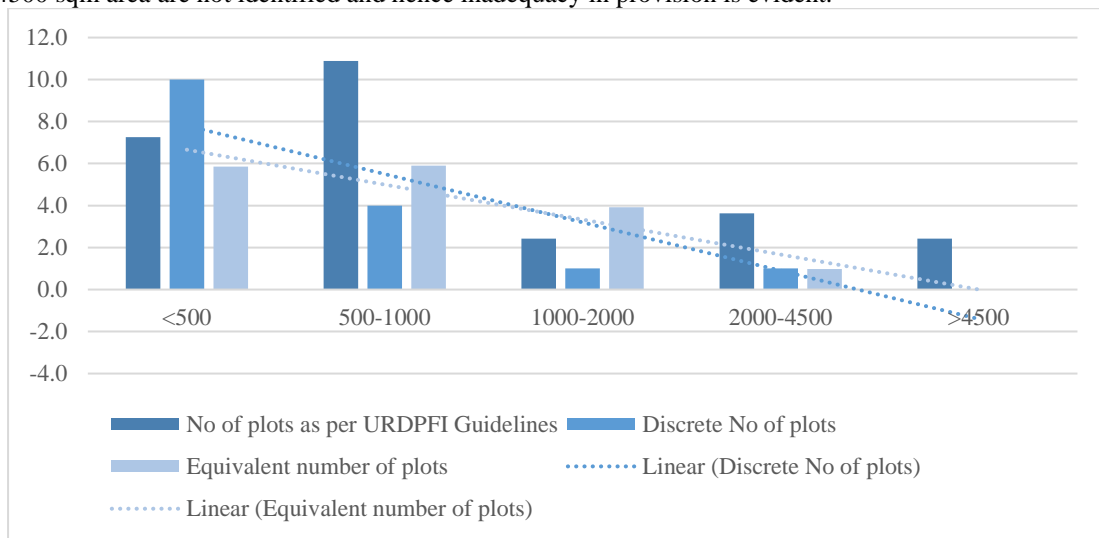


Figure 4. Provision of amenity sites in the study area (for Quadrants 1-4). Comparison of Discrete and Equivalent sites with the URDPFI Guidelines.

Analysis of Quadrant 10

The provision is analysed through Figure 5 which depicts that there is variation in provision across all the identified categories. The provision in site exceeds minimum provision levels in the smaller plot categories. The lesser number of equivalent plots compared to discrete plots in this category shows that the provision is highly fragmented in the form of smaller plots. In the 500-1000 sqm category, the existing provision is significantly less than the requisite provision as per guidelines, but the plot sizes are marginally bigger than the recommendations of the guidelines. The 1000-2000 sqm category shows marginally higher provision with the plot sizes conforming to the guidelines. The larger plots in 2000-4500 sqm and plots greater than 4500 sqm are not provided.

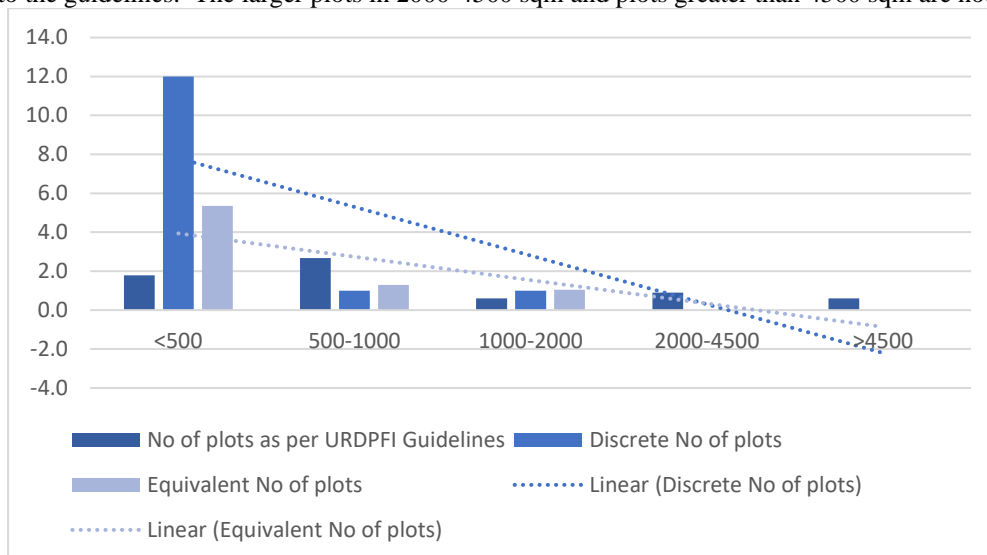


Figure 5. Comparison of provision of amenity sites in study area (for Quadrants 1-4) with the URDPFI Guidelines with respect to number of plots parameter

5. DISCUSSION

The analysis of provision of amenity plots in the study area indicate that the provision does not comply by the Guidelines of URDPFI. It is observed that the provision is higher with respect to smaller plots. This may be attributed to the process of defining public semi-public plots through layout formation process. The size of amenity plots is percentage area of the layouts formed. In the context of smaller layouts being formed, the amenity plots are predominantly of smaller size. Further, the Zoning Regulations do not specify minimum plot area for the amenity sites. Hence the provision of amenity sites is the resultant of peri-urban transformation process. Further consideration for allocating appropriately sized plots with respect to the type of amenity is ignored.

The inadequacy is significantly observed with respect to the larger plots. Since the quadrants of study are 70% to 100% parcelled, most of the land is allocated for other urban uses and hence it would be impossible to assign larger plots after the urban fabric is laid. It would also be a challenge to mobilize land for large amenity sites after transformation of rural fabric to urban fabric. The land values escalate as a consequence of transformation. The local authorities will need to invest larger resources to achieve minimum levels of provision. This high cost in securing land for public purpose will affect the overall service provision in the settlement.

With reference to Table 4, the amenities which are in the large site category are educational facilities- primary school, secondary school. Depriving convenient access to educational facilities is detrimental to the well-being of the community.

The URDPFI Guidelines provide a benchmark to assess provision, nevertheless, certain other factors such as social characteristics of the population, aspects of walkability with respect to the settlement structure are important in deciding the provision. The urban blocks generated in the settlement the interception of natural spaces and traffic impedances within the context of the residential neighbourhood need to be accounted in planning for provision.

Most residential extensions in peri-urban are laid amidst existing rural settlements. Hence the social composition of the peri-urban is predominantly heterogenous and is in constant transition (Allen, April 2003). This would demand public facilities appropriate to the needs of the communities. The rural communities continue to inhabit these spaces and, in most situations, continue to pursue their traditional livelihood activities related to farming, milk production, poultry etc. This would demand certain community facilities such as dairy, agriculture supporting infrastructure and other facilities relevant to the economic activities of the communities. Providing this infrastructure is very important to sustain these economic activities which in turn support the communities and cities by providing access to food and other resources and hence generating more sustainable systems. Depriving and ignoring such facilities and considering only urban communities in planning social infrastructure would displace the aboriginal communities or deprive them of livelihood options.

Also, the provision of amenity sites should be in excess considering increasing densities over a period due to increasing urbanization pressure. The demand on amenities would further increase in the context of enhancing accessibility to larger population, greater public awareness, improving quality of urban life (Hong Kong Planning, Standards and Guidelines). Higher standards of education, improvement in living standards will also demand better provision of amenities.

6. CONCLUSION

In the context of prevailing method of land allocation for public semi-public use in peri-urban Bangalore, it is realized that the provision is inadequate when compared to the guidelines of URDPFI. The method of identifying amenity sites ignores the requirement of various sizes of plots required by communities for different uses. The street networks also define the type of amenities which can be located on them. The prevailing method of allocating amenity sites ignores the transport network hierarchy of the settlement fabric. Further due to absence of microlevel plan, a comprehensive evaluation of relation between amenity plots of different layouts is also lacking. Every layout emerging is conceived as an independent entity with no consideration for the contextual situation.

Enabling walkability to these amenities from different parts of the neighbourhood by considering the availability of adequate facilities, street network pattern, the impedance offered by traffic are important to generate safe, livable environments. Diversity of social groups and their necessities for certain basic amenities at the housing cluster level and neighbourhood level need to be realized and plots suitably allocated. The amenity plots generate public spaces for the communities and hence engaging the local communities in identifying and developing these social infrastructure components would result in more relevant provision. Civic participation in evolving these amenities would make communities responsible and take pride in these facilities which are important for healthy neighbourhoods.

Hence the current method of land allocation for public semi-public uses do not suffice the basic needs of communities at the housing cluster level and neighbourhood level which in turn define livability within the settlement. Further this method of allocation does not account for various factors enumerated which are primary for such spaces to effectively function. It is imperative to refine and redefine the method of allocation of public semi-public sites in residential neighbourhoods in urban extensions which are part of the peri-urban realm.

7. REFERENCES

- [1] Knapp, T. A., & Graves, P. E. (1989). On the role of amenities in models of migration and regional development. *Journal of Regional Science*, 71-87.
- [2] Stülpnagel, R. V., Brand, D., & Seemann, A.-K. (September 2019). Your neighbourhood is not a circle, and you are not its centre. *Journal of Environmental Psychology*, 1-5.

- [3] Allen, A. (April 2003). Environmental planning and management of the peri-urban interface: perspectives on an emerging field. *Environment & Urbanization*, Vol 15 No 1; 135-147.
- [4] Brookfield, K. (October 2016). Residents' preferences for walkable. *Journal of Urban Design*, Vol. 22, no. 1, 44–58.
- [5] Brookfield, K. (2018). Resident's Preferences for Walkable Neighbourhoods. *Journal of Urban Design*, VOL. 22, NO.1, 44-58.
- [6] Gottlieb, P. D. (August 1994). Amenities as an Economic Development Tool: Is there Enough Evidence? SAGE; *Social Science Collections*, 270-285.
- [7] Jenks, M., & Dempsey, N. (March 2007). Defining the neighbourhood: Challenges for empirical research. *Town Planning Review (TPR)*, 153-177.
- [8] Manchester City Council. (March 2017). *Manchester Residential Quality Guidance*. Manchester: Manchester City Council.
- [9] Mathews, R., Pai, M., Sebastian, T., & Chakraborty, S. (July 2018, June 2020 8). STATE-LED ALTERNATIVE MECHANISMS TO ACQUIRE, PLAN, AND SERVICE LAND FOR URBANISATION IN INDIA. Retrieved from wrirosscities.org: World Resources Institute; <http://wrirosscities.org/our-work/research>
- [10] Natalie, A. (January 2015). Understanding the Importance of Urban Amenities: A Case Study from Auckland. *Buildings*, 85-99.
- [11] Planning Department, The Government of the Hong Kong Special Administrative Region. (March 2020). *Hong Kong Planning Standards and Guidelines, Chapter 3, Community Facilities*.
- [12] TCPO. (2007). *Model Guidelines for Urban Land Policy (Draft)*. Policy Guidelines. Town and Country Planning Organisation, Ministry of Urban Development, Government of India.
- [13] The City of Red Deer. (October 2013). *Neighbourhood Planning & Design Standards*. City Council.
- [14] Town and Country Planning Organisation. (January 2015). *Urban and Regional Development Plans Formulation and Implementation Guidelines*. Ministry of Urban Development, Government of India.
- [15] Town and Country Planning Organisation. (January 2015). *Urban and Regional Development Plans Formulation and Implementation Guidelines*. Ministry of Urban Development, Government of India.
- [16] United Nations, Habitat III. (October 2016). *The New Urban Agenda*. United Nations.