

TOWARDS SUSTAINABLE HOUSING ESTATE IN YANGON, MYANMAR

Miss Aye Mya MarLar Win
Department of Architecture, Mandalay Technological University
Mandalay, Myanmar
marlarwin81@gmail.com

Abstract

Housing is place in which to fulfill the fundamental purpose of human society and live a content life. It provides a necessary fundamental sense of security. It also gives a sense of belonging to a certain community. Housing space is the result of both physical and psychological activities that are continuously performed in everyday life. But the relocated inhabitants have been experiencing unsatisfying living conditions such as insufficient space, unavailability of fresh air, and lack of recreation space and open space due to the arrangement of primary design plan.

In Yangon, there are a few weaknesses in zoning planning. There is no control in floor area index, plot area ratio. Most of the housing estates in Yangon city are weak in terms of the creation of pleasant natural environment.

The paper studies the sustainable housing aspects of Yangon such as plot size, residential density, and analysis on land use, community facilities and space depth provide. The study is an attempt to develop general design principles that are practical and useful in the design process drawing on existing knowledge and theories of human behavior and social interaction. Our architecture is based on the concept of integrated architecture, which is architecture that is respectful of nature and which also creates a pleasant and comfortable environment for its occupants.

1.1 Housing related with sustainability

Sustainable Housing For Myanmar

- Mostly of housing estates in Myanmar didn't create satisfying living conditions. So housing estates must be considered the unique social, cultural and natural character of place. Sufficient space, availability of fresh air, recreation space and open space must be considered for estate residents.
- By creating of space in plot size to become usable space for inhabitants will get natural ventilation, air flow and daylight. So user comfort, harmonize the building with its surrounding.
- Efforts are also made to new housing developments in ways that to complete social requirements and to give more pleasant natural environment for estate residents.

1.2 Historical Background of Yangon City

Yangon city was designed for a population of 36,000. But the city has outgrown this figure by several times. Its population at present is 4.5 million.

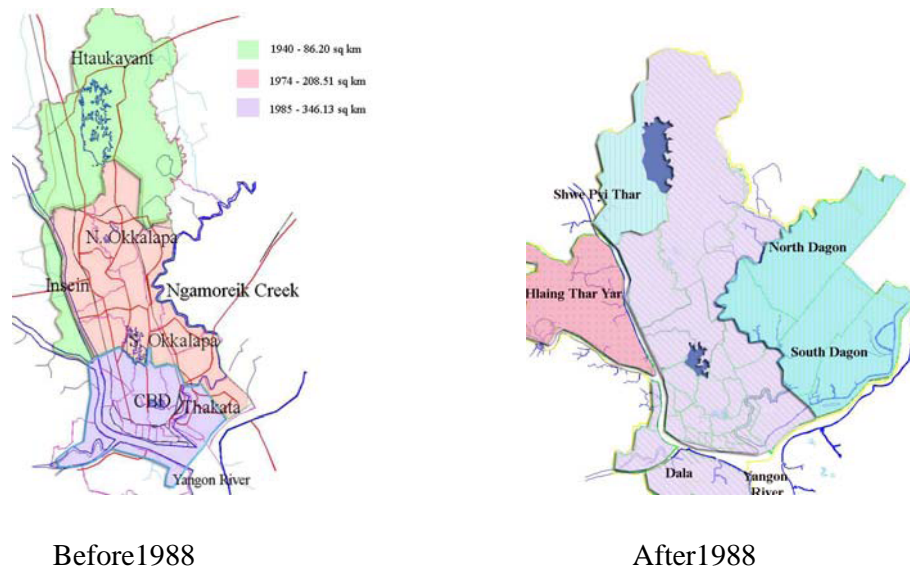


Fig.1 Area Developments of Yangon City

1.3 The News Estate Developments Projects in New Towns of Yangon City

The types of housing and development planning are quite differed in new towns areas and those in the inner urban areas because of highly different land values. The developments include commercial facilities, recreational facilities, community facilities as well as religious facilities. All the housing development projects in new town are in joint cooperation with private company and development.

2. Comparative Analysis On Three Housing Estates

2.1 Area Analysis of Three Housing Estate

1. Nawaday Garden Housing Estate

Developer	Chin Su (Myanmar) Co.Ltd
Location	Hlaing Tharyar township, Yangon It is on the Yangon Patheingyi Highway
Founded in	1994
Current population	6430 people (1286 families)
Area	approximately 328.8 acres
Residential building type	2 storey single family house
Facilities and amenities	Shop house, shopping centre, community centre, swimming pool, tennis court, fitness centre, football playground, middle school, dhama hall, 24 hour security system, landscaped park
Estate management	It is run by House Owner Association (HOA) of Nawaday



Fig.2 Master Plan of Nawaday Garden Housing Estate

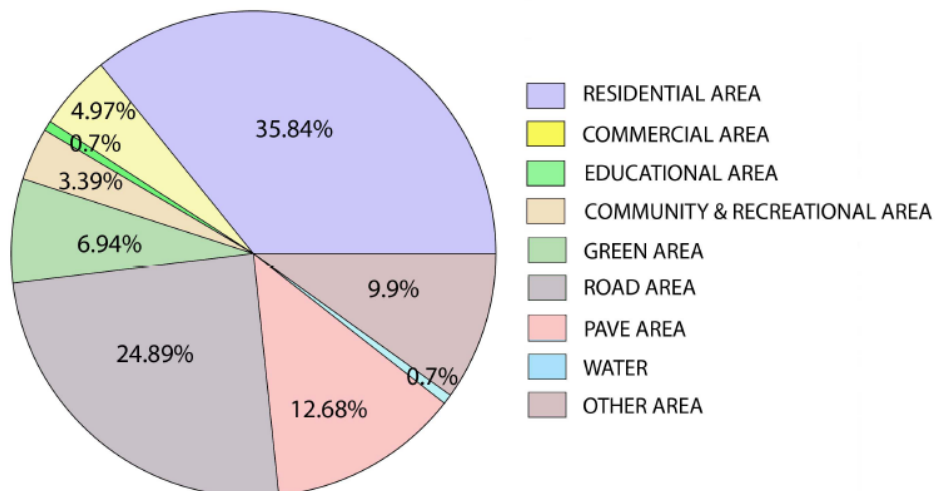


Fig.3 Area Analysis of Nawaday Garden Housing Estate

Table.1 Area Analysis of Nawaday Garden Housing Estate

Residential area	5134084.52 sq ft (117.9 acres)	35.84%
Commercial area (Shopping Mall + Shop Houses)	711770.4 sq ft (16.34 acres)	4.97%
Educational area (School)	100188 sq ft (2.3 acres)	0.7%
Community &Recreational area (Dhama hall + Community Center)	(10454.4 + 474804) sq ft (0.24 + 10.9) =11.14 acres	3.39%
Green area	993784.51 sq ft (22.8 acres)	6.94%
Road area	3566056.10 sq ft (81.9 acres)	24.89%
Pave area	1816769.95 sq ft (41.7 acres)	12.68%
Water area	98998.68 sq ft (2.3 acres)	0.69%
Other area	1413568.885 sq ft (32.45 acres)	9.9%

Total area – 14323475.57 sq ft (328.8 acres)

2. FMI City Housing Estate

Developer

FMI Garden Development Ltd.

Location

Hlaing Tharyar township, Yangon
It is on the Yangon Patheingyi Highway and
only 8-miles from Yangon

Founded in

1994

Current population

4882 people (977 families)

Area

approximately 500 acres

Residential building type

2 storey single family house

4 storey walk up apartment

Facilities and amenities

Bank, super market, recreation centre,
swimming pool, tennis court, billiard
room, putting green, clinic, 24 hour
security system, landscaped park,
express bus service, market, PABX
telephone system

Estate management

It is run by three departments; estate
management, project management,
marketing management



Figure.4 Master Plan of FMI City

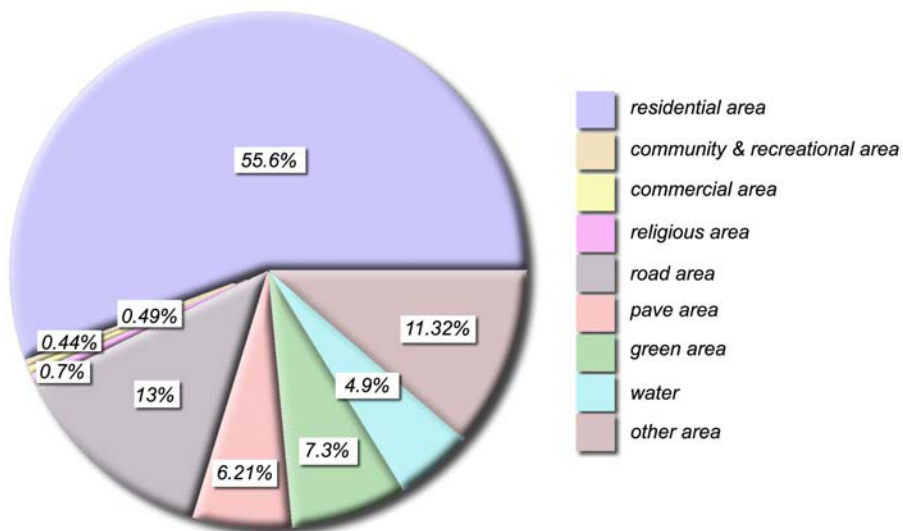


Fig.5 Area Analysis of FMI City Housing Estate

Table.2 Area Analysis of FMI City Housing Estate

Residential area	9556964.64 sq ft (219.4 acres)	55.6%
Community &Recreational area (Community Center)	75627.83 sq ft 1.7 acres	0.44%
Commercial area (Market +Shopping Center +Bank)	83958.63 sq ft (1.37+0.4+0.2)=1.97acres	0.49%
Religious	122372 sq ft (2.8 acres)	0.7%
Road area	2234609.57 sq ft (51.3 acres)	13%
Pave area	1067336.63 sq ft (24.5 acres)	6.21%
Green area	692643.19 sq ft (15.9 acres)	7.3%
Water area	843698.51 sq ft (19.4 acres)	4.9%
Other area	2502856.69 sq ft (57.5 acres)	11.32%

Total area - 17180067.69 sq ft (394.4 acres)

3. Dagon Yeik Mon Housing Estate

Developer	Olympic Co.Ltd
Location	North DagonTownship, Yangon It is on the No (2) Road Highway.
Founded in	2004
Area	approximately 358.18842 acres
Residential building type	2 storey single family house
Facilities and amenities	Shop house, shopping centre, community centre, fitness centre, pre-school, park, hospital, football playground, and 24 hour security system

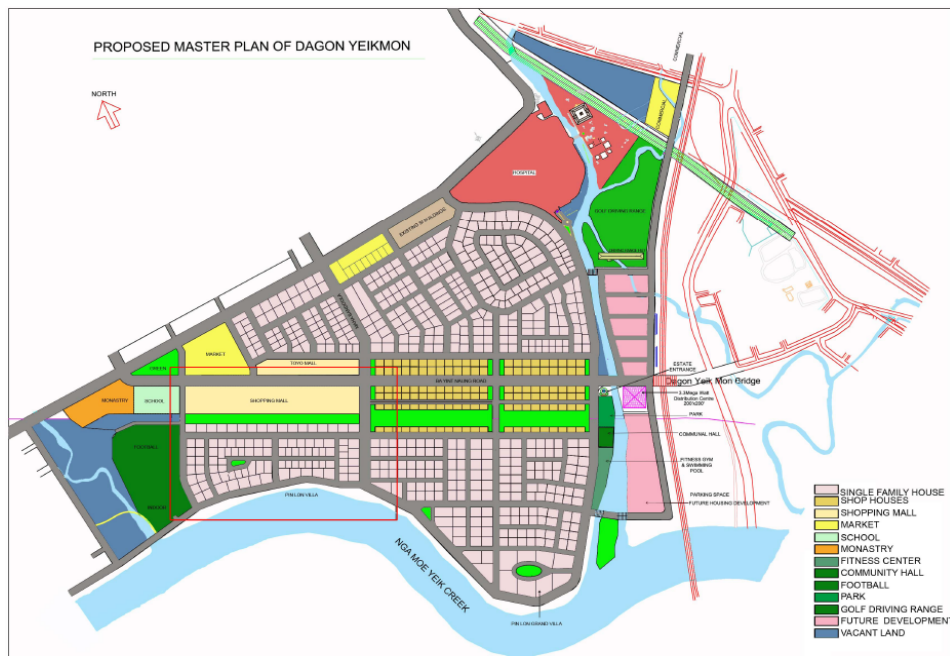


Fig.6 Master Plan of Dagon Yeik Mon Housing Estate

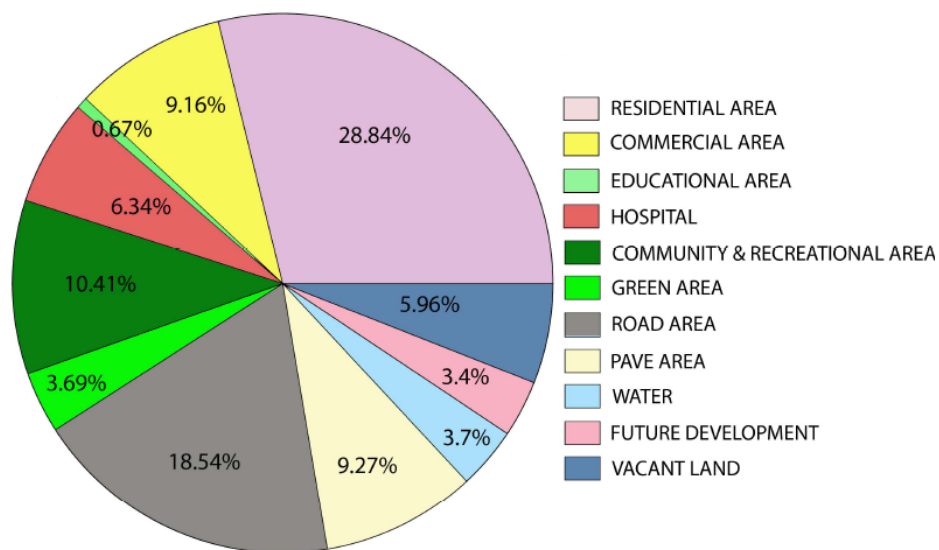


Fig.7 Area Analysis of Dagon Yeik Mon Housing Estate

Table.3 Area Analysis of Dagon Yeik Mon Housing Estate

Residential area (Single Family Houses + Terrace Housing)	(4380754.74+117821.2)sq-ft (100.57+2.7) =103.27acres	(28.08+0.76) 28.84%
Commercial area (Shopping Mall+ Toyo Mall + Shop Houses+ Market + Commercial)	(395250+134877.2+586780.7 +201269.52+111848.57)sq-ft (9.07+3.1+13.47+4.62+2.57) = 32.83acres	(2.53+0.86+ 3.76+1.29+ 0.72) 9.16%
Educational area (Pre-School)	104550 sq-ft 2.4 acres	0.67%
Health	989361.28 sq-ft 22.71 acres	6.34%
Community& Recreational area (Monastery+ Park+ Football+ Fitness Center& Swimming Pool+ Community Center+ Golf + Sport Ground)	(149451.57+39689.47+ 482732.3+57727.48+ 26479.15+551101.68+ 319811.7) sq-ft (3.43+0.91+11.08+1.33+0.61 +12.65+7.3) = 37.31 acres	(0.96+0.25+ 3.09+0.37+ 0.17+3.53+ 2.04) 10.41%
Green area	576494.56 sq-ft 13.23 acres	3.69%
Road area	2893499.72 sq-ft 66.43 acres	18.54%
Pave area	1446749.86 sq-ft 33.21 acres	9.27%
Water area	577083.15 sq-ft 13.25 acres	3.7%
Future Development	531487.98 sq-ft 12.2 acres	3.4%
Vacant Land	930209.4093 sq-ft 21.35 acres	5.96%

Total area - (15602687.57 sq-ft) 358.18842 acres

2.1.1 Plot size

	Nawaday Garden Housing Estate	FMI City Housing Estate	Dagon Yeik Mon Housing Estate
Net dwelling density	10.9 dwelling unit per acre	8.4 dwelling units per acre	7 dwelling units per acre

From standard

For multi-family dwelling, total land area is derived from its component parts:

1. area covered by buildings,
2. outdoor living space,
3. area for services, laundry drying, walks and set backs,
4. off-street residential parking areas,

These together constitute the net residential land area.

Recommended lot sizes for one- and two- family houses will result in maximum densities:

Detached one-family houses – 7 units per net acre of residential land
Semidetached houses – 12 units per net acre of residential land

2.1.2 Residential Density

	Nawaday Garden Housing Estate	FMI City Housing Estate	Dagon Yeik Mon Housing Estate
Residential Density	20 people per acre	24 people per acre	-
Current population	6430 people (1286 families)	4882 people (977 families)	-

From standard

Area of half mile radius = 502 acres. (According to fundamental urban theory)

Approx: neighborhood population = 7000 people. (According to fundamental urban theory)

Approx: residential density for one neighborhood should be 14 people per acres.

Neighborhood Size

- Local case studies - within half mile radius
- Literature survey - 0.75 to 1 mile square (6000 to 8000 people)
- Fundamental urban theory - within half mile (7000 people)
- Neighborhood size should not exceed half mile radius.
- Approximate neighborhood population should be within 6000 to 8000 people.
- FMI and Nawaday are within half mile radius.

Finding

Net dwelling density of local housing estate is generally higher than 7 units per acre.

Residential densities of existing housing estates are generally higher than 14 people per acre.

In local case studies, all facilities and amenities of housing estate are within half mile radius.

2.2 Comparative Analysis of Land Uses

2.2.1 Residential area

	Nawaday Garden Housing Estate	FMI City Housing Estate	Dagon Yeik Mon Housing Estate
Residential area	35.84% of the land area.	55.6% of the land area.	28.84% of the land area

From standard

Maximum percent of site for residential use – 35% (Source: Community Builders Handbook)

2.2.2 Social-Cultural and Services Facilities (Community Facilities)

Community &Recreational area

	Nawaday Garden Housing Estate	FMI City Housing Estate	Dagon Yeik Mon Housing Estate
Community &Recreational area	9.06% of the land area.	1.63% of the land area.	16.71% of the land area. (excluded golf area)

From standard

Community space - Should accommodate social, cultural, educational, and physical activities of particular interest to the community, multipurpose within a radius of ½ to 1½miles; accessible by walking, and provided that the total area is no less than 15 percent of the land area.

2.2.3 Open space

	Nawaday Garden Housing Estate	FMI City Housing Estate	Dagon Yeik Mon Housing Estate
Open space	7.63% of the land area.	12.2% of the land area.	7.4% of the land area.

From standard

A minimum of 10% of the total site area will be required for open space. Roadside margins and other small portions of ground will not be included when making calculations. Open space as much as 30 percent of the land area to remain in its natural state, while housing the same number of facilities as conventional development

2.2.4 Road area

	Nawaday Garden Housing Estate	FMI City Housing Estate	Dagon Yeik Mon Housing Estate
Road area	24.89% of the land area.	13% of the land area.	18.54% of the land area

From standard

For economical considerations, circulation area should not exceed than 20% of the total land. Foot path should have better pavement than motor ways. (Source: Community Builders Handbook)

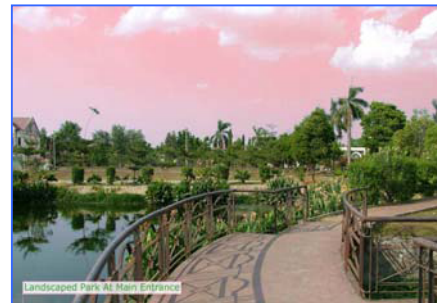


Fig.8 Entrance of Nawaday Housing Estate

Street Standards
Recommendations of Street Standards for Traffic Safety

Design of residential streets			Design of feeder or collector streets	
Single-family		Multifamily		
Street width	50 ft	60 ft	Street width	60 ft
Pavement width	26 ft	32 ft	Pavement width	36 ft
curbs	Straight curb	Same		Straight curb
Sidewalks: Width	4 ft minimum		Sidewalks : Width Setback	4 ft minimum 3 ft minimum 7 ft minimum with trees
Setback	3 ft minimum 7 ft minimum with tree	Same	Horizontal alignment	Same as for local residential streets
Horizontal alignment	200 ft minimum sight distance	Same	Vertical alignment	Same as for local residential streets
Vertical alignment	6-8% maximum grade desirable	Same	Pavement surface	Same as for local residential streets (25 mi/h maximum speed.)
Cul-de-sac	400-500 ft maximum length	Same	Design of intersection(Sight distance)	No building or other sight obstruction within sight triangle
Turnarounds	40 ft minimum curb radius without parking 50ft minimum curb radius with parking	Same	Vertical alignment	Flat section preferred from 50 to 100 ft each way from intersection, but in no case over 3-5% grade: 6% maximum between 100 and 150ft of intersection

Pavement surface	Nonskid with strength to carry traffic load	Same	
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Source: Chiara, J.D., Panero, J. and Zelnik, M. 1995. "Time-Saver Standards for Housing and Residential Development."

2.2.5 Street pattern and width

	Nawaday Garden Housing Estate	FMI City Housing Estate	Dagon Yeik Mon Housing Estate
Street pattern	rectangular or grid street Loop Street	rectangular or grid street curvilinear street cul-de-sac street	rectangular or Grid Street Loop Street cul-de-sac street
Vehicle Road width	Main road 100 ft Secondary road 80 ft Tertiary road 60 ft 40 ft	Main road 50 ft Secondary road 22ft Tertiary road 11 ft	Main road 100 ft Secondary road 80 ft Tertiary road 60 ft 40 ft
Pedestrian Pave width	Main road 6 ft Other road 3 ft	4 ft	Main road 6 ft Other road 3 ft

-Curvilinear street can create more interesting view because of changing vista. Cul-de-sac can give more privacy to residential lots. The disadvantage is more distance must pass through to access facilities.

-Rectangular street can achieve more visual harmony and visual balance. It can also give direct view and direct access from one place to another.

Finding

Residential areas of local housing estates are generally greater than 35% of the land area.

FMI city, Community & Recreational area is very few percent because of no football playground and elementary school. In local case studies, no consideration for public library is found and should be located in or near community centre.

In local case studies, open space within 7% and 12% of the land area. (Roadside margins and other small portions of ground will not be included when making calculations. Open space should be created more than existing.

(eg. Nawaday and Dagon Yeik Mon Housing Estate)

Road area of Nawaday housing estate is greater than 20% of the land area.

2.3 Analysis of Community Facilities

2.3.1 Recreation center

Facility	Location and Distance	No; served	Description	Planning Consideration	Acres per 1000 population
Recreation center	¼-½ mile	Up to 5000	A multi-purpose building. Usually includes a gym, swimming pool, and game rooms. Meeting rooms and other multi-purpose areas.	This facility may be part of a school or located in a park. It may generate noise and should thus be somewhat separated from other quieter facilities. Ease of parking is desirable.	1

Source: Chiara, J.D., Panero, J. and Zelnik, M. 1995. "Time-Saver Standards for Housing and Residential Development."

Nawaday Garden Housing Estate

Number served - 6430 people (1286 families)

Recreation center - within ½ mile

(support complex) - multipurpose building includes a fitness center, swimming pool, tennis court, park, football playground
 - located at near the school
 - 10.9 acres

Its recreational facilities are located at the centre of the site.

It is more convenient for estate residents because they can access within half mile radius equally.

FMI City Housing Estate

Number served - 4882 people (977 families)

Recreation center - within ½ mile

- Recreation centre with swimming pool, tennis court, billiard room, and putting green
 - located within ½ mile, but far from the other block
 - 1.97 acres

Locating near main gate can access easily for other people but more walking distance for housing residents.

Dagon Yeik Mon Housing Estate

Recreation center - within ½ mile

- Recreation centre with a fitness center, swimming pool, and park
 - located at near the main gate
 - 13.93 acres (include football area)

Locating near main gate can access easily for other people but more walking distance for housing residents. Community center and playground are isolated.

2.3.2 Religious center

Facility	Location and Distance	No; served	Description	Planning Consideration	Acres per 1000 population
Religious center	¼-½ mile	Up to 5000	A place of worship and often a social center for the congregation.	Should be easily accessible, on foot if possible, and located in a quiet area with sufficient space for landscaping and off-street parking.	

Source: Chiara, J.D., Panero, J. and Zelnik, M. 1995. "Time-Saver Standards for Housing and Residential Development."

Nawaday Garden Housing Estate

Number served - 6430 people (1286 families)

Religious center - within ½ mile
 - a social center for the congregation
 Dhamma hall give a good vista for the estates as well as reflect the Myanmar architectural character dominantly
 - located at near the school
 - 0.24 acres

FMI City Housing Estate

Number served - 4882 people (977 families)

Religious center - within ½ mile
 - a social center for the congregation
 Monasteries give a good vista for the estates as well as reflect the Myanmar architectural character dominantly
 - located at end of the housing
 - Monastery should be located peaceful and quite area
 - 2.8 acres

Dagon Yeik Mon Housing Estate

Religious center - within ½ mile
 - a social center for the congregation
 Monasteries give a good vista for the estates as well as reflect the Myanmar architectural character dominantly
 - located at end of the housing
 - Monastery should be located peaceful and quite area
 - 3.43 acres

Myanmar Cultural Activities

Most of people in our country are Buddhist and essential religious requirements should be pagoda, monastery and dhamma hall.

2.3.3 Elementary school

Facility	Location and Distance	No; served	Description	Planning Consideration
Elementary school	Central, ¼-½ mile	Up to 5000	Usually the major community facility providing the center of activity for children and mothers.	2-4 acres for larger schools would be appropriate. Allowance 5 to 6 acres more if the neighborhood playground is to be included. Should be accessible by footpath from dwelling units without crossing streets and near center of residential area near or adjacent to other neighborhood facilities.

Source: Chiara, J.D., Panero, J. and Zelnik, M. 1995. "Time-Saver Standards for Housing and Residential Development."

Nawaday Garden Housing Estate

Number served - 6430 people (1286 families)

Elementary school - Central, within ½ mile

- is considered one of the basis organizational elements of the neighborhood
- beside the collector road
- located at near the recreational complex
- 2.3 acres

In Nawaday housing estate, its middle school is at the centre of site and it is more convenient for children to go to school.

FMI City Housing Estate

Number served - 4882 people (977 families)

Elementary school - not found in site area

- isn't considered one of the basis organizational elements of the neighborhood

FMI has middle school but it is located outside the site. Children must cross the main road to go to school. It can cause hazard to children.

Dagon Yeik Mon Housing Estate

Elementary school - within ½ mile

- is considered one of the basis organizational elements of the neighborhood
- beside the collector road
- located at community zone, but more workable distance for the children
- 2.4 acres

Educational Facilities

- The essential requirement for one neighborhood is a primary school.
- The primary school should be within safe walking distance.
- The maximum distance to access this facilities should not exceed half mile.
- Playground should be considered in school side for the children.

2.3.4 Neighborhood Shopping Center Size

Population served	Floor area required (sales area)	Customer parking area 2 to 1 ratio	Circulation service and planting areas, 25%	Total square feet	Square feet per family (gross)	Walking Distance
1600 families, 5000 persons	18ft ² per family = 28,800 ft ²	57,600ft ²	36,400 ft ²	172,800 (4acres)	100	½ mile

Source: Chiara, J.D., Panero, J. and Zelnik, M. 1995. "Time-Saver Standards for Housing and Residential Development.

Nawaday Garden Housing Estate

Number served - 6430 people (1286 families)

Shopping Center - within ½ mile

- near main gate
- 0.74 acres
- Without Circulation service, planting and Customer parking

FMI City Housing Estate

Number served - 4882 people (977 families)

Shopping Center - within ½ mile

- near main gate
- 0.74 acres

Dagon Yeik Mon Housing Estate

Shopping Center - within ½ mile

- near main gate
- 9.07acres
- With Circulation service, planting and Customer parking



Fig.9 In FMI City, Padatharpin Market Fig.10 Shop house of Nawaday Garden

2.3.5 Medical Facilities

FMI City, clinic located in site area.

Hospital located in Dagon Yeik Mon Housing Estate for estate residents and other people.

Finding

There are two types in locating community facilities in local housing estates: near main gate and centre of site. Locating near main gate can access easily for other people but more walking distance for housing residents (eg. FMI). Locating centre of site can achieve shorter and equal walking distance for housing residents (eg. Nawaday). The three housing estates are complete in recreational facilities in community area or sport complex but not consider for residential block to have children play area, landscaped park and garden.

The most people are Buddhist in our country, so essential requirements are Pagoda, Monastery and Dhamma Hall.

In local case studies, school was located beside the collector road so many dangerous for the children. In local case studies, no consideration for public library is found and should be located in or near community shopping centre.

Myanmar cultural activities, most people buy the vegetables and meat in the market. So wet market can be found in the housing.

3. Studies on Plot Sizes

Local study,

Total floor area – 2100 sq-ft, from Nawaday garden city (without garage)

Total floor area – 2584 sq-ft, from Dagon Yeik Mon Housing Estate
(with garage)

Local study,

Total lot area – (40X60) sq-ft = 2400 sq-ft, from Nawaday garden city
(without garage)

Total lot area – (60x80) sq-ft = 4800 sq-ft, from FMI city (with garage)

Total lot area – (80x80) sq-ft = 6400 sq-ft, and Dagon Yeik Mon
(with garage)

From standard

Total lot area – (60x100) sq-ft = 6000 sq-ft (including outdoor living, service, walks and setback)

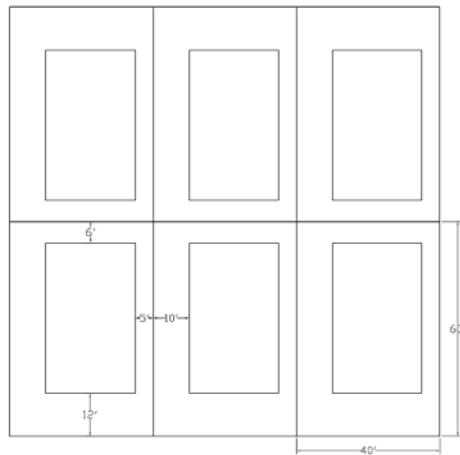
From standard, between building and fence wall distance is no less than 5m because of adequate light and air.

Ground-level outdoor space should, if possible, be between 400 and 800 ft²; 400 ft² is a minimum requirement.

3.1 Analysis of Plot size

Plot Size of Nawaday Garden City

Plot size – 40ft x 60 ft = 2400 sq-ft



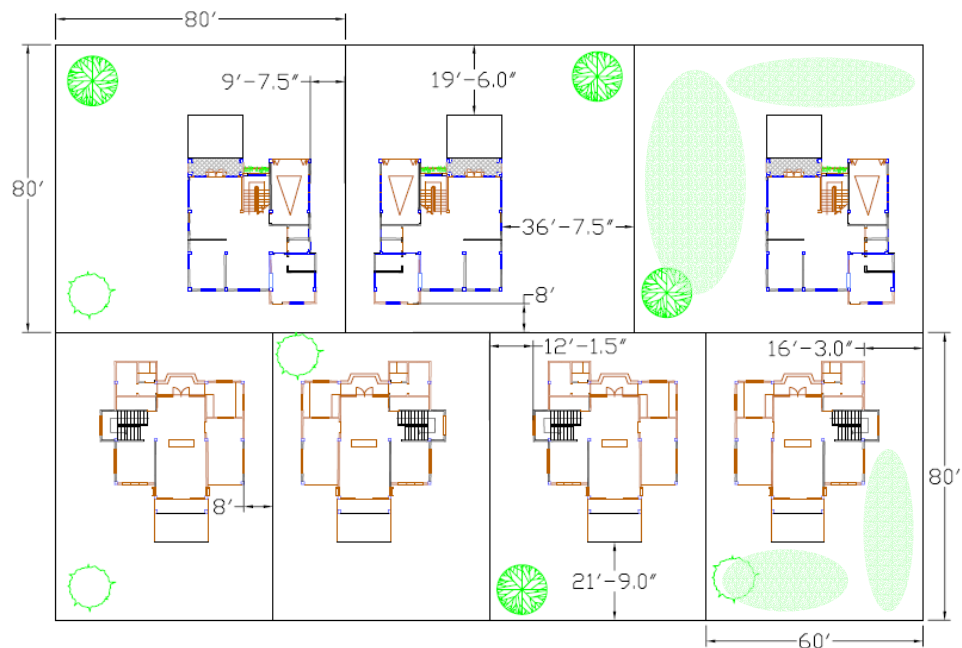
- 5 ft - this space is unusable space
 - may become the pile garbage
 - close to the fence, so weak of air movement
 - close to the adjacent plot
- 10ft - can use outdoor space (or) landscape planting
- 12ft - can use outdoor space in evening or at night because view and breezes can be got

Car garage hasn't in this plot size. It is lack (outdoor space for family) if garage contain.

Plot Size of Dagon Yeik Mon Housing Estate

Plot Size – (60ftx80ft) = 4800 sq-ft

– (80ftx80ft) = 6400 sq-ft



This space can be use

- as outdoor living to get wind for the hot summer children play area
- area for services, laundry drying, walks and set backs
- recreation area (eg. sitting, talking, playing in evening and at night)

From standard

Residential lots of 50 or 60 ft in width should not greatly exceed 130 ft in depth. Practical building sites requires lots at least 50 ft wide to provide adequate side yards for light, air, driveways, and to avoid crowding.

3.2 Myanmar Family Size

In Myanmar's case, base on Statistical Yearbook, it is taken as 5 persons per dwelling unit.

People living in middle class housing, family size by housing living is found from 4 to 6 household numbers mostly. (Khin Lin Nwe, Ma. Jan, 2007. Architectural design criteria for middle class housing in Yangon. Ph.D(Thesis).Mandalay Technological University).

Plot Size in Yangon

Started plan of plot size in Yangon

CBD – (25 ft x 40 ft), (25 ft x 50 ft), (25 ft x 60 ft)

Other Zone – (100 ft x 100 ft), (½ acre)

Now plan of plot size in Yangon (40 ft x 60 ft), (60 ft x 60 ft), (80 ft x 80 ft), (100 ft x 100 ft)

3.3 Analysis of average floor area

Floor areas for 5 persons of single family

Shrine – 75 sq-ft (as Myanmar Cultural Activities)

Living room – 320 sq-ft

Dining room – 300 sq-ft

Kitchen – 160 sq-ft

(3)Bed room – 432 sq-ft

Bath & WC – 60sq-ft

One car garage – 209 sq-ft

Total – 1556 sq-ft

Source: Chiara, J.D., Panero, J. and Zelnik, M. 1995. "Time-Saver Standards for Housing and Residential Development."

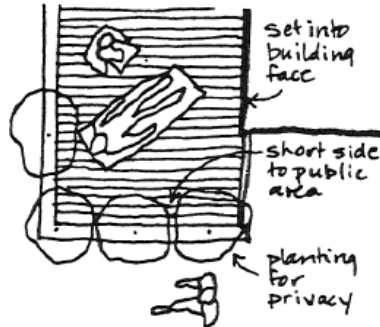
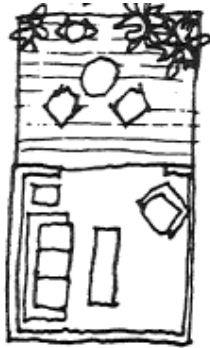
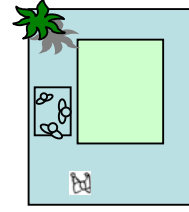
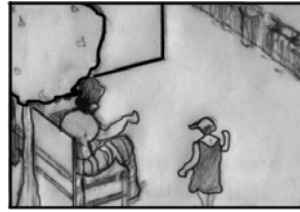
One car space (min) need to consider in Housing.

3.4 Myanmar Cultural Activities

Myanmar people have been lived in the precinct for a long time. After, hut to apartment scheme and move to slums and squatters and by law and regulations, plot size defined. Nowadays, people need to more than space for the standard of living high. People want to desire to live in wide space with recreation area.

Uses of outdoors space

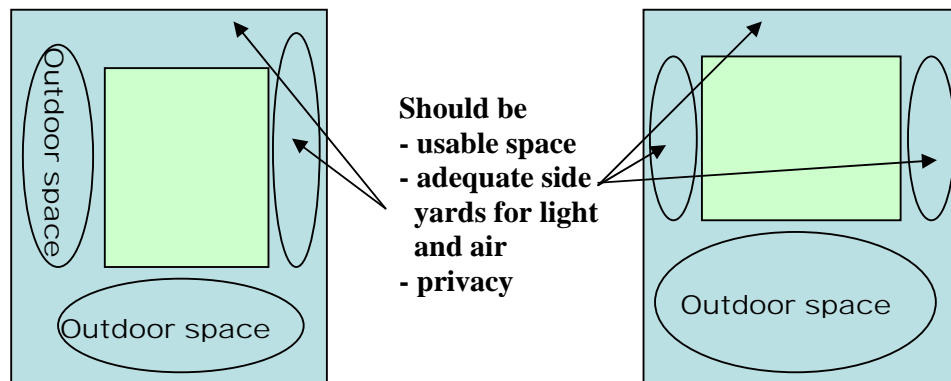
- Full advantage of outdoor living areas should be taken, especially where the climate permits it for more than a few months of the year. Orients the private outdoor space to receive sun at least part of the day.
- In developments where all households are likely to be families with children the off-grade private open space might overlook the central court or children's play area.
- Used to private open space that held ceremonies.



Living

Family

3.5 Recommendation of Plot Size



By creating the space in plot size to get usable space

- create outdoor space
- get lighting and ventilation
- create human comfort
- create more enjoyable lifestyle with pleasant natural environment
- achieve sustainable housing without fail traditional roots
- harmonize the building with its surrounding
- arrange the block as necessary to get wind
- area for services, laundry drying, walks and set backs
- use natural light and air so free energies

Space Development

Plot size should be within (60ft x 80ft) and (80ft x 80ft).

Conclusion

Users get comfort and convenient by considering human behaviors and social interaction for estate residents. Estate residents can get more comfortable and fresh air by creating of open space in the plot size and in the housing estate. In this paper, efforts have been made on the analysis of local housing estates .It is also attempted to analyze on urban theory and literature survey. From comparative analysis, the most possible factors can get for future housing estate.

REFERENCES

Book-

- [1]. Chiara, J.D., Panero, J. and Zelnik, M. 1995. "Time-Saver Standards for Housing and Residential Development."
- [2]. Khin Lin Nwe, Ma. Jan, 2007. Architectural design criteria for middle class housing in Yangon. Ph.D(Thesis).Mandalay Technological University.
- [3]. Moe The Phyu, Ma. Jan, 2006. Analysis on housing for low-income community in Yangon. M.Arch (Thesis).Yangon Technological University.