

SERVICE STANDARDS FOR EGYPTIAN NEW COMMUNITIES (TOWARDS LOCAL GUIDELINES)

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1) ABSTRACT

As a result of the adoption of new communities policy, many new communities are planned and being established in Egypt. In the absence of service supply standards, planners depend upon their own conceptualization of service supply rates. Their particular experience and continuous improvisation have led to the application of their own views for each new community, depending on their own studies and professional experience. This could be seen as the right approach for achieving the supply standards found to satisfy local demand for services, relative to the particular socio-cultural and economic characteristics of the society intended to inhabit the communities. Moreover, it has been noted throughout the last decades that, service supply standards for new communities have differed from those available in the existing communities because of the economic pressures during this period.

However, indicators for the service standards must exist. This will provide for flexible standards that will allow the selection of the suitable standard for each society. The importance of this issue becomes clearer if the economics of establishing such services is taken into considerations. Since, it greatly affects the amount of investment needed for developing these services, within their settlements. Moreover, such indicators will provide the basis for maintaining social justice between the divers communities of the society with regard to national commitment for service supply. In other words, the national commitment for delivery of specific standard of services to each citizen, is a tool for achieving social balance, and ensures the achievement of a particular standard of living.

2) THE PROBLEM

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The absence of local Egyptian standards for services which consider the planner's tool; It is essential to formulate a range of service standards to be used by planners in Charge of service supplies sector within the planning team. These standards will serve as directive indicators for putting forward the specific service standard for the community under planning, considering the particular characteristic of such community . This argument is further, reinforced by the fact that most of the developed countries have gone through the experience of developing service standards for their communities over the years. The above-illustrated experiences of the developed countries provide such service standards. Accordingly, A number of Egyptian new communities must be selected for the case study in order to examine service areas (standards which used in the planning of these communities). It is essential to find a system of measure (parameter scale) for the currently diverse service standards. This scale can be induced by the use of computer analysis and programs.

2-1: Main criteria for selecting new communities

It seems appropriate to put some criteria for the selection of case study new communities, which must be used in this application study. The selected communities must have master plans, detailed plan, accompanied by reports for the plan that explain the planning ideas and all details of service standards, and the spatial patterns of service distribution .

The criteria are: -

- 1 - Select a group of communities which are distributed within the territories of Egypt in order to cover the location, environmental, community influences.
- 2 - The communities are of diverse population size in order to include the effects of town size on service standards.
- 3 - The selected communities must also be of diverse densities to include the effects of changing density on the service standards
- 4 - The selected communities must comprise most types of service spatial patterns.

Regarding these limitations, 18 new communities have been selected for the study application.

2-2: The selected communities

For over thirty years ago the policy of constructing new communities had started. A large number of new communities had been planned (specially near Cairo and around it) . Now they are a fact, since the major part of them is constructed or in the final stages of construction .

On the basis of the selection criteria, about 18 new communities are selected, they can be classified relative to their location into three groups as follows: -

2-2-1: First group: Greater Cairo region: -

- 1) The **ten satellite communities** around Cairo along the new ring road with population equal to 200,000 person for each one (Tagammoh "5" is selected as an example of these communities).

- 2) **6 October city:** About 30 km from Cairo on Cairo/Alex. road, planned for 350,000 inhabitants.
- 3) **Ext of 15 May:** An extension for the 15 May new city in the south of Cairo for 60,000 inhabitants .
- 4) **El-Amal :** In the southeast part of Cairo on the Kattameia road, for population about 250,000 inhabitants.
- 5) **10 Ramadan:** In the north east of Cairo, nearly about 55 km. on Cairo/Esmaelia road and about 30 km from Belbasse city, for 500,000 inhabitants
- 6) **El-Sherok :** In the north east of Cairo between Cairo/Suez road and Cairo/Esmaelia road and about 37 km from Cairo. The city was planned for population about 320,000 inhabitants .
- 7) **Bader city:** About 46 km from Cairo on the east along Cairo/Suez road for 278,000 inhabitants .
- 8) **El-Ebour city:** In the north of Cairo along Cairo/Belbasse road for 475,000 inhabitants.

2-2-2: Second group: North of Egypt: -

- 1) **New Alamein :** On the northern west of Egypt along Alexandria/Matroh road and near to the old Alamein city . The new city was planned for 65,000 inhabitants .
- 2) **New Ameria (Bourg El-Arab):** On the north coast of Egypt and on the west of Alexandria. The city was planned for 500,000 inhabitants .
- 3) **El-Nobaria:** On the Cairo/Alexandria desert road, about 80-km south of Alexandria, it was planned for 140,000 inhabitants.
- 4) **New demiatte:** In the north of Egypt near to Demiatte city, the new city was planned for 270,000 inhabitants.
- 5) **Quantra shark:** In the east of the existing city on the east side of Suez Canal and about 147 km from Cairo. The city was planned for 27,000 inhabitants
- 6) **Shatta:** In the east of Demiatte city along Demiatte/Port said road. It was planned for 30,000 inhabitants .
- 7) **Sadat city:** In the midway between Cairo and Alexandria but near to Cairo, it is about 93 km in the north of Cairo. The city was planned for 500,000 inhabitants .

2-2-3: Third group: south Egypt: -

- 1) **New Quena :** This city represents an extension of the existing Quena city but in the north direction to cover all the existing city requirements . This extension was planned for 108,000 inhabitants .
- 2) **New Menia:** It is found in the East Side of Nile river in the other side of the existing Menia city, it was planned for 120,000 inhabitants.
- 3) **New Assiut:** It is a satellite town to the main Assiut town, it is about 12 km far from the mother city, and it is planned for 131,000 inhabitants

Table (1) shows main data for these cities

Table (1) Egyptian new community's data (case study selection

S	THE CITY	(A)	(B)	(C)	(D)	(E)	(F)
		Population	Urban area	Residential density person\acre	Total service areas "acres"	Service area (percentage)	share per Person Sq.m.
1	QUANTRA SHARK	27,000	267	101	46.88	17.5%	7.29
2	SHATTA	30,000	217	138	47.83	22.0%	6.7
3	EXT. OF 15 MAY	60,000	515	116	165.1	32.0%	11.56
4	EL ALAMEIN	65,000	866	75	243.1	28.0%	15.7
5	NEW QUENA	108,000	1350	80	503.4	37.2%	16.38
6	EL MENIA	120,000	1398	85	307.4	21.9%	10.76
7	NEW ASSIUT	131,000	1791	73	496	27.6%	15.9
8	EL NOBARIA	140,000	1525	92	395.6	25.9%	12.78
9	TAGMOH (5)	200,000	1984	100	592.7	29.8%	12.4
10	EL AMAL	250,000	2984	83	766	25.6%	12.86
11	NEW DEMIATTE	270,000	3060	88	1045.7	34.2%	17.37
12	BADER	277,800	2755	100	635.7	23.0%	9.6
13	SHEROK	320,000	3530	90	1091.3	30.9%	14.4
14	6 OCTOBER	350,000	4900	71	1434	29.2%	17.21
15	EL-EBOUR	475,000	2630	180	749.7	28.5%	6.63
16	10 RAMADAN	500,000	10768	46	1813.6	16.8%	15.2
17	EL SADAT	500,000	5405	92	987.5	18.3%	8.29
18	NEW AMERIA	500,000	9805	50	2550.6	26.0%	21.42

Source: Compiled by the author from the specified reports of the new communities

4 : DATA ANALYSIS

4-1 : The S.I.R. Model (services intermediate range)

Analyzing the service areas, which was used in the selected new communities. It is observed that there are clear variations between these standards, for the same type of services. This is mainly due to the lack of local Egyptian standards. Therefore, it is essential to find some ranges for local standards, or indicators and guidelines for their values. These service standard indicators can be considered as ranges which consists of minimum and maximum values in order to reflect some forms of flexibility to match diverse cases, (environmental, socio-economic factors, etc.).

The idea of the service Intermediate range model (S.I.R) depends on finding the best regression curve for the supplied data by mathematical calculations. Hence this curve can be assumed as a mathematics representation of these data. Accordingly, getting the equation of this curve, it is possible to find the two critical points of the curve, which "mathematically" represent the maximum and the minimum points of the curve. The distance between these two points can be considered as the best range for all the given data, as shown in figure (1). Using of computer program (Ener Graphics software, copy right1988 concludes this can) as the following process: -

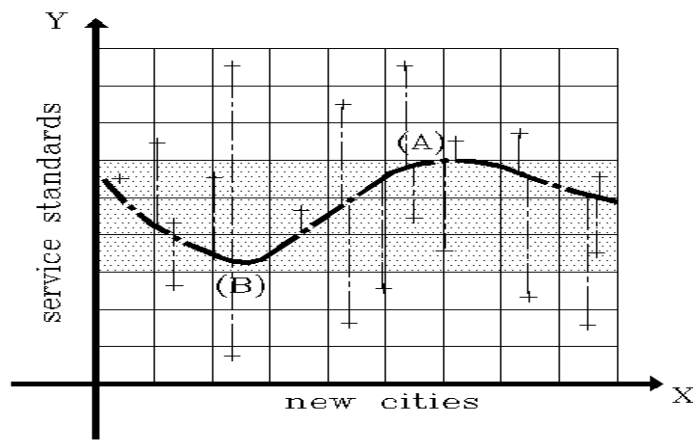


Figure (1): The intermediate range idea

- ◆ Collecting all service standards, which were used in the new communities in forms of ratios and areas / person for every kind of services, for the different levels of planning (N.H. level, community level, city level and cumulative level)
- ◆ Using computer analysis for all the data collected by entering these data of every kind of services to the computer program Ener graphics which accepts the data in two ordinates (x, y). This program is prepared to get the best regression curves for any group of various data and also gives the equations of these curves . (I.e. this program selects the best-fit lines or curves as required which path in the middle of a group of various points in x, y diagrams).
- ◆ By using the output curve equation for the data of any kind of services it can find the maximum point of this curve and also the minimum point, which the curve path. Mathematically these points are the critical points of the curve . The following figures (1&2) show this process and the point "A" is the maximum point and "B" is the minimum point. This way , the difference of these two points A , B should be considered as the middle range for these data . So, it is essential to determine the accurate values of these points to obtain the required range and this can be done as the following process.

4-2: S.I.R. model process (methodology & framework)

Using the **Ener** graphics program, it was possible to illustrate the best-fit line trend for the diverse data, (which is the simple case of the program application). It provides the best-fit line and its equation (second-degree equation) in the following form:

$$Y = a + a_1 X + a_2 X^2$$

Where: [a , a₁ , a₂ are the equation coefficients]

[X is the proposed city density]
 [Y is the standard values]

To attain more accuracy for the best-fit curve, the program must be asked to use the equation of third degree, which is:

$$Y = a + a_1 X + a_2 X^2 + a_3 X^3$$

Where: [a, a₁, a₂, a₃ are the equation coefficients]

[X is the proposed city density]
 [Y is the standard values]

Mathematically, to find the critical points for the curve concluded. the equation curve must be differentiated. Then, the concluded equation must be equalized to zero to obtain the two equations values. this is done as follows :-

$$\therefore Y = a + a_1 X + a_2 X^2 + a_3 X^3$$

(this equation is the output of computer program)

$$\therefore \frac{dy}{dx} = a_1 + 2a_2 X + 3a_3 X^2$$

$$\therefore \text{At critical point } \frac{dy}{dx} = 0$$

$$\therefore a_1 + 2a_2 X + 3a_3 X^2 = 0$$

which is an equation of second degree, it can be solved to find the two values of X by using the mathematical general law .

$$X_1, X_2 = \frac{-b \pm \sqrt{b^2 - 4AC}}{2A}$$

while :- A is the coefficient of X² = a₃
 b is the coefficient of X = a₂
 C is the absolute value = a₁

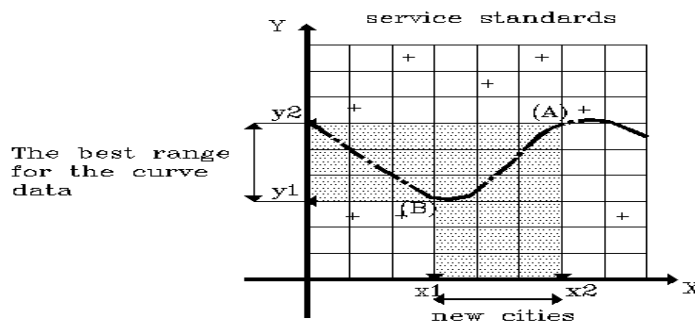
$$\therefore X_1, X_2 = \frac{-a_2}{2a_3} \pm \sqrt{\left(\frac{a_2}{a_3}\right)^2 - 4a_3 a_1}$$

Then after getting the two values of X¹, X² which is represented as two points in the horizontal X axis(as shown in figure-2-).It is possible to get the two other corresponding values in the vertical Y axis accurately, by using the deduced values of X₁, X₂ in the curve equation which is given earlier by the computer program as follows :-

$$Y = a + a_1 X_1 + a_2 X_1^2 + a_3 X_1^3 \longrightarrow \text{point A}$$

$$Y = a + a_1 X_2 + a_2 X_2^2 + a_3 X_2^3 \longrightarrow \text{point B}$$

Thus, the accurate values of the minimum and maximum points on the best regression curve are obtained. They represent the intermediate range of all proposed standards to be the primary guide of the local Egyptian standards . By repeating this calculations with the computer program “Ener graphics”, the intermediate ranges of all the required standards for all planning levels are concluded. Figure (2) shows the diagrammatic representation for critical points and their corresponding values (X_1, X_2) , (Y_1, Y_2) .The above system can be used as a mathematical system to calculate the intermediate ranges of all the required service areas . This method is called (**service intermediate range model S.I.R.**).



Figure(2): Diagrammatic representation for the critical points and their corresponding values

4-3 Service intermediate range model applications)

By analyzing the collected data of service areas for the selected new communities. It is noted that these areas, are calculated relative to the proposed classification of service intermediate range model .

Therefore the following part shows (by the use of service intermediate range model), the similarities or differences between the standards of services for the new communities. The results of S.I.R. model application for all city levels are as follows :-

4-3-1 the community level services

According to the collected data of community level, which was illustrated and arranged, relative to population gross density. Using the computer program Harvard graphics, the diagrammatic presentation is displayed for linear relations of these standard data, and its trend, relative to the increase of density. In these diagrams the new communities are arranged relative to their community densities in the horizontal (x) axis and the standards in the vertical

(y) axis. The standards, which analyzed are calculated in terms of square meter per person for types of services ,as in the following :

1. Person share of total community services .
2. Percentage of total community services to the total community area .
3. Person share of community education services.
4. " " " religious services.
5. " " " commercial services.
6. " " " health services.
7. " " " social services.
8. " " " cultural services.
9. " " " recreation services.
10. " " " administrative services.
11. " " " public services.
12. percentage for every type of services to the total community services.

4-3-2 the city level services

The city level services mean the types of services made available at the city center together like hospitals, parks and sport facilities.....etc. S.I.R. model process was applied according to the collected data for Egyptian new communities of the city level.

4-3-3 Cumulative services for city

The cumulative city level means the collective sum of all the service standards for all the levels of the city. It is calculated by the division of, total services (sum of , N.H services + community services + city level services) by total population of the city, in order to deduce the share per person for this level.

5) INDICATORS FOR LOCAL EGYPTIAN SERVICE STANDARDS (S.I.R. MODEL DEDUCTIONS)

Indicators for local Egyptian service standards can be deduced as a result of S.I.R. model application. The application process on the service standards(applied by the professional planners for the new communities in Egypt) was calculated using the method explained above to deduce the intermediate ranges of service supply indicators as shown in table (2) &(3). All the results are summarized in two tables , the first one (table 2) is for intermediate ranges of the total service areas for the different levels of service supply for the city. The second (table 3) is for the intermediate ranges of service elements

Table (2) : Total service areas (percentage)

PLANNING LEVEL	SERVICE AREA	SHARE PER PERSON	AVERAGE
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	(percentage)	sq.m.	
N.H. LEVEL	15%	4.0	N.H. area = 50 - 60acres
	18%	5.0 sq.m.	N.H. pop = 7000-8400 pop
COMMUNITY LEVEL	5.1%	3.1	AREA = 275 - 430 acres
	7.80%	5.0 sq.m.	POP. = 32000 -43000
CITY LEVEL	9.6%	3.7	
	13.20%	6.0 sq.m.	
TOTAL SERVICES (CUMULATIVE)	21.5%	11.7	
	29%	15.2 sq.m.	

Table (3) : The intermediate range of service standards indicators

	SERVICE ELEMENTS	N.H. LEVEL		COMMUNITY LEVEL		CITY LEVEL	CUMULATIVE LEVEL
		Service area (percentage)	Sq. m. per person	Service area (percentage)	Sq. m. per person	Sq. m. per person	Sq. m. per person
1	EDUCATION	42% - 53%	1.89 - 2.38	21% - 34%	0.42 - 1.05	0.44 - 0.58	3.4 - 4.0
2	RELIGIOUS	4% - 6%	0.18 - 0.27	3.8% - 7.2%	0.11 - 0.21	0.08 - 0.2	0.38 - 0.69
3	COMMERCIAL	11% - 21%	0.49 - 0.95	10% - 16%	0.47 - 0.98	0.54 - 0.73	1.55 - 1.7
4	HEALTH	-	-	3.5% - 7.8%	0.12 - 0.18	0.21 - 0.37	0.37 - 0.45
5	SOCIAL	-	-	4.6% - 10.2%	0.12% - 0.31%	0.05 - 0.09	0.22 - 0.59
6	CULTURAL	-	-	3.7% - 6.2%	0.18 - 0.23	0.08 - 0.22	0.23 - 0.37
7	RECREATION	28% - 35%	1.26 - 1.57	23% - 30.8%	0.88 - 2.1	2.2 - 3.2	4.4 - 5.4
8	ADMINISTRATIVE	-	-	3.8% - 5.8%	0.03 - 0.13	0.07 - 0.16	0.17 - 0.31
9	PUBLIC	3% - 4%	0.14 - 0.18	9.6% - 17.5%	0.18 - 0.55	0.35 - 1.15	0.45 - 2.30
	TOTAL SERVICES	15% - 18%	4.0 - 5.0	5.1% - 7.8%	3.1 - 5.0	3.7 - 6.0	11.7 - 15.2

Note : Table hatched areas mean Big gaps, which will need further research

5-1 Neighborhood Level

The main component in the neighborhood level is the education services (which consists of the principle school and the kindergarten) Education services represent about 50% of the all neighborhood services followed by the recreation services (about 30% of total neighborhood service areas) . The remaining services, which constitute 20% of the total, are devoted for religious commercial and public services . It is noted also that, the difference between the minimum and maximum values of intermediate ranges reflects small gaps. This means that

the service standards of neighborhood are nearly had definite values, particularly for the educational services.

5-2 Community level

At the community level , the main service component is recreation, followed by education, which is contrary to neighborhood level. The education and recreation services represent about 50% of the total community services, while all remaining services represent the other 50% . Some types of services have not stability in values, since their intermediate ranges reflect wide gaps, they are :

- Person share of education services.
- The percentage of health service to total community services.
- The percentage of social service to total community services.
- The person share of recreation, administrative and public services.

While the other types of services can relatively be considered stable, since the gaps of their intermediate ranges have small values .

5-3 City level

The main service component at this level is still recreation, followed by cultural, in the second rank, and the commercial services in the third ranks. There are also , some types of services, which reflect wide gap values in their intermediate ranges in terms of person share for :-

- Religious services
- Cultural services
- Administrative services
- Public services

Other types of services reflect small gap values in their intermediate ranges, which mean more stable standards .

5-4 City cumulative level

As for the city cumulative level , the recreation services continues to attain the first rank of total city services, followed by the education services as the second rank, and commercial services as a third rank. Most of the service components at the city cumulative level are relatively stable, (with small gap values), while two other types of services reflect a wide gap, they are :

- Social services
- Public services

6) CONCLUSIONS (LOCAL SERVICE STANDARDS)

- 1) Tables 2 & 3 show the results of application of the intermediate range model (S.I.R.), which can be considered indicators for local standards. These indicators will serve as directive indicators for putting forward the specific service standards for new communities under planning, considering their particular characteristic.
- 2) The intermediate ranges represent indicators of the local Egyptian standards. They have minimum and maximum values in order to be flexible when applied by professionals in the field of planning for service supply .
- 3) The intermediate ranges presented in table (2)shows that, as general the standards of social administrative and public services still show a wide gap of their intermediate ranges, which mean that these types of services are still relatively indefinite, as used by professionals in charge of service supply.
- 4) The other types of services (Education , Religious , Commercial , Health and Recreation) have relatively acceptable difference in values of intermediate range, which shows more stable indicators. They could be considered in their final stages of being local standards.
- 5) The recreation services represent the highest value component of services for the most planning levels followed by education services in the second rank, and the cultural or commercial in the third rank .

Recommendations:

- National financed project for performing Local Egyptian standards .
- Local authorities and decision-makers must be informed.
- Local Egyptian standards must be integrated with urban planning laws .

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