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Research Article

The Spatial Distribution of the Basic Education Schools in Lattakia City (Syria)

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Abstract

The main aim of the study is to detect the spatial degree of inequality and adequacies in the provision of first and second stage of basic education schools between different wards of Lattakia city, with respect to the population they serve. Secondary data were used for this study sourced from the inventory of the Educational Direction and the Direction of Statistic of Lattakia. Statistical techniques were employed to analyze data such as Mean deviation, Locational Quotient, Lorenz Curve and Ratio Schools/pop. The findings of the study indicated that the population and number of schools are not equidistributed. This revealed the existing of gaps in access to this facility between wards with some wards experiencing glut and concentration while other suffering lack and have no adequate access to this facility: for both F.S. and S.S. schools, L.Q. value varies from 0 to 2.6, and from 1.94 to 0.6 for S.S; Ratio population/schools varies from 1:2971.7 to 1:16776, and from 1:50329 to 1:5057. Lorenz Curve indicate that about 50 % of schools are enjoined by about 50 % for F.S. schools and 60% for S.S. schools. The study concluded that there was a need for intervention of planners and government in the provision of basic schools in deficient wards to enhance human development.

Keywords: Spatial distribution, Inequality, first and second stages, basic education schools, Locational Qutient, Lorenz curve, Ratio, Lattakia

1. Background

Since independence, the Syrian succeeded governments adopted in all constitutions the gratuity and obligation of education at the primary stage. They assured in every national planning to provide budget and educational facility such as schools all around rural and urban area according to criteria, although an accelerated rate of population growth and urbanization. Thus, mains cities (headquarter of governorate) enjoyed educational facility from primary to secondary schools, whereas small rural settlements frequently have only primary schools because of the small size of village and the large distance between them, especially in the Eastern region.

In the light of demographic and social changes process of the 1990s and 2000s, the national directives focused on education, as an effective tool to develop human resources, a major factor to lead to an economic and human resources development, and a tool enabling human resources to integrate labor market, while until 1994, the low level of educational structure of population hamper the positive investment of human resources, as more than 60% are analphabet or primary licensed, and 80% of the poor belong to this category in 2004. (Rapport of Syrian commission of population, 2011).

For reaching the objective, the government adopted the Basic Education according to the law No. 32 in 2002. The law defines Primary education as First stage, and the Preparatory education (lower secondary education) as Second stage, thus extending the age category to (6-14 years old). The education curriculums have been modified in favor of more foreign languages and informatic skills.

But, Human and economic development doesn't depend only on quality. It depends also on the equality and adequacy of spatial distribution location of schools and access to educational facilities, when until now, spatial inequality is an important feature of majority of developing countries, and accessibility to basic education has been identified as a major indicator of human capital formation.

This study aims at exploring whether the educational facilities are evenly and equally or arbitrary distributed to the urban people in Lattakia, one of the most Syrian cities reputed for its progressive society. The study aims to assess the relationship that exists between spatial distribution of schools and population distribution in Lattakia city by different

wards. This paper analyses the distribution of First Stage (F.S.) schools and Second Stage (S.S.) schools to establish the spatial degree of in- equality and concentration in the provision of basics educational facility.

this is necessary because data on the location of educational facilities are primordial to enable government and city planners to establish a coherent policy and determine how best to meet the education-related needs of the population, and this will be a quantifiable index of human development. The present study sets out to provide the required information of the existing conditions of educational facility in Lattakia to help in planning for adequate planning.

2. Theoretical Frame Work (Literature Review)

The dictionary of human geography-johnston (dictionary) defines "geography of education" as a scientific discipline consisting of "the study of spatial variations in the provision, uptake and output of educational facilities and resources" as cited in (Kučerová & Kučera, 2012): they add " Considering the issue of inequality, geographers examines the territorial difference in schools facilities across regional or local level". According to Alzeer,(2005) : "The fact that geography matters in relation to educational provision applies in a number of different ways. For example, it is unequally distributed across space." However, what unites geographers is the issue of spatialities of the provision of educational facility. In other word, the distribution of schools facilities, and even more its unequal distribution across space". According to *Rawls principle of justice as quoted* by Malczewski and Jackson (2000),"educational services should be organized in a way remotely situated that maximizes individual within a school district" The equity concept can also be operationalized by minimizing variability of access to educational services. Variability can be measured in terms of the standard deviations or variance of residence to place of educational services". He add that "the more schools, the closer each potential user is to the one serving him or her".

In a review of literature and studies focusing on the equality of spatial distribution of educational facilities through the relationship between population number and schools, many studies can be mentioned about developing countries as there is a dearth of works and studies about Syria.

In a study carried out in Bida City, Nigeria M. Haruna, D. & M. Bala, Banki, (2012), analyzed the distribution of primary and secondary schools. The result revealed that the distribution of primary and secondary schools are not guided by population distribution in the wards (L.Q. varied between 0 - 6.8 for primary schools and 0-27.2 for secondary schools). This implies that some areas in Bida city are deficient in basic education facilities and quiet a number of the inhabitant have no adequate access to these facilities. Gini Coefficient indicates relatively some degree of inequality (Gini Coefficient with a value of 0.57).

In Saudi Arabia, studies have shown an inequality of spatial distribution of schools facilities. Alzeer, (2005) have examined the efficiency of the spatial distribution of secondary public schools in Riadh city. The result indicates the shortage of public secondary schools in the north of the city and overcrowding in the majority of primary school (the capacity have exceeded the optimum by 19.05% to 141.46% for girls schools and 24 to 90 in boys schools). Alsagri & Aldugairi, (2013) have examined the spatial characteristic of public high schools for girls in Buraidah city. The study revealed that schools are unevenly distributed across the 70 districts consisting the city; for all the city there are 44 schools distributed over only 30 districts (3 districts with 3 schools, 8 districts with 2 schools, and 19 districts with only one schools), where the remains 40 districts still without schools, although representing 57% of districts and 62% of the city area. Ratio schools/10000 people, shows that there are 8 districts having below standard, 7 wards having their just ratio, and 10 wards having more than standard.

The same was found in Iraq. Juneitt, (2015) have examined the efficiency of the spatial distribution of primary schools in Alazizia city according to planning criteria such as different ratios. The study revealed the existing of spacing between schools among wards, shortage in number of schools, and so, crowding in class (33-20 pupils/class) and ratio of pupil/schools superficies equal to 4.3 m² against 16.6 m².

This present study is therefore designed to analyze the spatial distribution of schools facilities in Lattakia city, hoping to add value to literature and planning actors.

3. The Study Area

Lattakia city is the study area. It is the capital of Lattakia governorate. This is located to the north-western Syria on the eastern Mediterranean coast, bordered Turkey to the north. It is situated within latitude 35º 29´ and 35º 35´ North and longitude 35º 43´ and 35º 49´ E. It has a land area of 2970 km², representing 1.3% of Syrian territory. The Syrian Costal Mountains comprise about 65%, and culminated over 1555 m, covered with a variety of Mediterranean vegetation, and agricultural land with citrus fruits, olives, and tree fruits.

The governorate shares boundaries with the coastal governorate of Tartus in the south, Hama in the central Syria in the east, and Idlib in the north-east (Fig.1). The governorate is divided into 4 districts, inhabited by (999417) people according to early projected population census of 2012. Thus the density of population stood at about 365 P/km², representing the most densely populated governorate after Damascus.

Lattakia city is lie by the coast and located 348 km north-west of Damascus. The city occupies a promontory in mid distance of the coast. The sit has been inhabited since the 2end millennium BCE, in the era of the kingdom of Ugarit, to be refunded in the 4th century BCE under the rule of Seleucid succeeded by the Romains, comprising the totality of promontory. The city land area continued to reduce until the start of XX to about 1.6 km². It is today 58 km² surpassing the promontory to the suburb area of the small village around. This was a result of an accelerating urbanization process that started during the French mandate (1920-1946) and continued for decades. Accordingly, the city became the main port of Syria, and had provided in infrastructures and equipments services: administrative, economic, educational, etc.

The city ranks first in population size in the Costal region and fifth on the national level, after Aleppo, Damascus, Homs and Hama, with population of 383000 in the census figure of 2004 and projected population of 439834 people in early 2012 with density of 7700 people/ km², to comprise about 45% of population of the governorate, and 85 % of its urban, while rural is distributed within hundreds of small and large villages all around the governorate, (Wazzan, 2016).

Lattakia city consists of 15 wards, and they are as follow: *Shekh-Dhaher, Oueneh, Slaybeh,Tabyat, Qalaat, Raml-Jnobi, Jamet-Tishreen, Thawra, Baeth,7 Nissan, Tishreen, Daatour, Bisnada, Jmhoryeh, Dmsarkho,* (Fig. 2). There is a large space inside the city occupied by industrial, touristic, agricultural, port and university area.

Fig. (1). Map of the governorate of Lattakia showing the study area
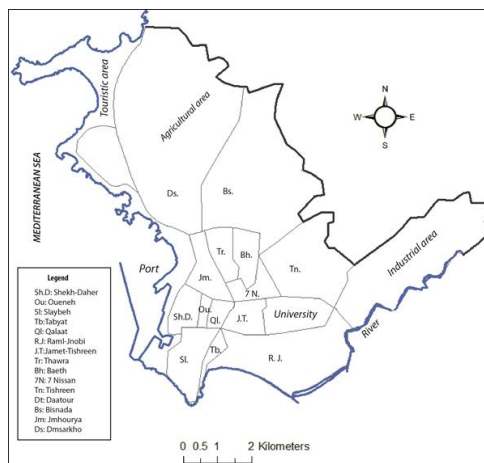

Fig.(2). Map of Lattakia city showing the existing wards

4. Methodology

Data for this work is secondary. It was gathered (collected) from various sources. Information on the number of educational facilities centers, First and Second stage schools, (F.s. and S.s.) and its spatial distribution was based on the name of schools and their addresses according to different wards were obtained from the records of the Education Direction in Lattakia governorate, while a schema borders of wards was obtained from the municipality. The population for early 2012 was obtained from the Statistical Office Center of Lattakia, projected from census figure of 2004, with the governorate urban population rate of 1.7%. This date (2012) seems the last to be taken as credible. Because until this date, the Syrian crisis, declared in march 2011, did not yet cause a significant demographic change due to people evacuation inside and outside the country, which accentuated in the middle of this year, especially from internals governorates to coastal, in relative stability. Data were also obtained from relevant literature and archives sources in both lattakia and Syria country. Data were arranged in table and used to describe trends, and figures and maps elaborated.

To measure the degree of spatial in-equality distribution of schools, the work employed some technic of spatial statistic. The statistical technique used are:

Location Quotient (LQ): this analysis was carried out to show the extent of spatial inequality and the degree of concentration of schools distribution in the wards. LQ was computed by dividing the ratio of number of primary schools in each ward to total in all wards by the ratio of the population of each ward to the total population of all the wards. It is computed using the formula:

$$L \, Q \, (X,A) = \frac{\frac{No.of\ commodity\ X\ in\ A}{No.of\ commoity\ X\ in\ the\ city}}{population\ of\ ward\ A\ /\ population of\ the\ city}$$

The locational quotient of each ward is expected to be 1.0. Locational Quotient with value less than 1.0 signify that the ward is marginally disadvantaged in the location of the facility concerned, while LQ of value more than 1.0 signify that the ward is marginally advantaged in the location of the facility concerned. The farther the value of LQ is from 1.0, the higher the degree of undue deprivation bestowed on the ward in terms of location of the facility.

Lorenz curve: it is a tool widely used in geography to measure inequality. It is a graph showing the proportion of overall variable assumed by the bottom x% of the population. It is used in this study to represent schools distribution where it shows for the bottom x% of population, what percentage y% of the total schools they have. The percentage of population is plotted on the x-axis, the percentage of schools on the y-axis. A perfectly equal schools distribution is where the bottom N% of population would always have N% of the schools.

Mean Deviation: is a measure of dispersion. It is an average of absolute differences (differences expressed without plus or minus sign) between each value in a set of values, and the average of all values of that set. It is computed by this formula: $M\,D = \frac{\sum(xi - x)}{n}$

where x is the mean, xi is each value, *n* is number of items.

Ratios and percentages were also used to describe the proportion of a variable to another in 2012 (such as the ratio of number of schools to people by ward).

5. Results and Discussion

5.1   Number and means of First and Second Stage schools:

Data in table 1., shows the distribution of First and Second stage schools in Lattakia city. It reveals that the total number of the schools both F. and S. reach 104 in all the city: (58 F. S. schools, and 46 S.S.), with a majority of public schools (90% for both), all distributed on the 15 wards of the city. The means by ward is 6.9. First Stage schools are distributed on 14 wards except for 1 (Oueneh), which has no F.S. school whereas Jomhorya and Damsarkho have the most number 7. The mean is 3.7 F. schools/ward. Second Stage schools are distributed overall the 15 wards with a mean of 3.1 school/ward: the less ward is also Oueneh and Raml Jnobi with only 1 and the most are both Slybeh and Jomhoryeh with 7 S. schools. The mean deviation the number of schools by wards shows more dispersion and inequality for F.S. schools (1.9) than S.S. schools (1.3).

Table 1: Distribution of number of First and Second Stages schools in Lattakia city by wards (2012)

Ward	Public school (F.s.)	Private school (F.s.)	Total (Xi)	(Xi-X)	Public school (S.s.)	Private school (S.s.)	Total (Xi)	(Xi-X)
Shek.D.	3	1	4	0.1	2	1	3	0.1
Oueneh	0	0	0	3.9	1	0	1	2.1
Slybeh	6	2	8	4.1	6	1	7	3.9
Tabyat	8	0	8	4.1	3	0	3	0.1
Qalaat	2	0	2	1.9	2	0	2	1.1
R.Jnobi	3	0	3	0.9	1	0	1	2.1
J-Tishreen	3	0	3	0.9	2	0	2	1.1
Thawra	2	0	2	1.9	2	0	2	1.1
Baeth	3	0	3	0.9	4	0	4	0.9
7 Nissan	2	0	2	1.9	3	0	3	0.1
Tishreen	2	0	2	1.9	2	0	2	1.1
Daatour	4	0	4	0.1	3	0	3	0.1
Bisnada	2	0	2	1.9	2	0	2	1.1
Jmhorya	6	1	7	3.1	6	1	7	3.9
Dmsarkho	5	2	7	3.1	2	1	3	0.1
Total	**52**	**6**	**58**	**28.9**	**41**	**4**	**45**	**18.9**
Mean (X)	-	-	**3.9**	**-**	-	-	**3.1**	**-**
Mean Deviation	-	-	**-**	**1.9**	-	-	**-**	**1.3**

5.2   Location Quotient of First and Second Stage schools:

As shown in table 2 below. At the level of all the city, the LQ value for each F.S. and S.S. schools is close (1.05 – 1.08) respectively, which means advantaged. However, at the level of wards the LQ value varies for each F.S. and S.S. schools, (figures 3 and 4).

Table 2: Location Quotient (LQ) of First and Second Stage of basic schools in Lattakia City 2012

Ward	2012 early pop. projection	Total F.S.	LQ	Total S.S.	LQ	Grand total
Shek-D.	28522	4	1.06	3	1.03	7
Oueneh	14815	0	0	1	0.65	1
Slaybeh	54148	8	1.11	7	1.26	15
Tabyat	33545	8	1.80	3	0.87	11
Qalaat	19733	2	0.76	2	0.99	4
R.Jnobi	50329	3	0.45	1	0.19	4
Jamet Tishreen	23374	3	0.97	2	0.83	5
Thawra	32104	2	0.45	2	0.60	4
Baeth	29387	3	0.75	4	1.33	7
7 Nissan	32563	2	0.45	3	0.90	5
Tishreen	18284	2	0.82	2	1.07	4
Daatour	27458	4	1.09	3	1.60	7
Bisnada	10114	2	1.5	2	1.94	4
Jmhorya	42130	7	1.25	7	1.63	14
Dmsarkho	20802	7	2.54	3	1.41	10
Akeibeh*	1143	-	-	-	-	-
Hreishieh**	987	-	-	-	-	-
Total	**439834**	**58**	**1.05**	**45**	**1.08**	

Source: researcher. * and ** are located in border of the industrial area and don't have the criteria of 10000 population to be served in schools.

For F.S. schools the LQ value varies between (2.5) in Damsarkho, having the most concentration of F. S. schools, and

(0) in Oueneh in completely lack. Only (7) of the existing (15) wards, (46.6%) are marginally advantaged in the distribution of F.S. schools and have LQ of more than 1.0. these are : Dmsarkho (2.5), Tabyat (1.8), Bisnada (1.5), Jomhorya (1.3), Daatour, Slaybeh and Shekh-Daher, each having (1.1). one of wards have their faire share of F. S. schools of 1.0. this is : Jamet -Tishreen. The remaining (6) wards (40%) are marginally disadvantaged in term of distribution of F. S. Schools, and have locational quotients of less than a fair share of 1.0., these are: Tishreen and Baeth (0.8), Raml- Jnobi, Thawra, 7 Nissan (0.5), Oueneh (0).

For S. S. schools, LQ value varies between (2.0) in Bisnada, and (0.2) in Raml-Jnobi. Only 8 of the existing 15 wards are marginally advantaged in the distribution of S. S., and have locational quotients of more than 1.0. these are: Bisnada (2.0), Jmhoryeh and Daatour (1.6), Dmsarkho (1.4), Sleybeh and Baeth (1.3), Tishreen and Shekh-Daher (1.1). Only one ward, Qalat, has just its fair share with LQ value of (1.0). The remaining 6 wards are marginally disadvantaged and have LQ value of less than 1.0. these are: 7 Nissan and Tabyat (0.9), Jamet-Tishreen (0.8), Oueneh (0.7), Thawra (0.6), and the most disadvantaged is Raml Jnobi (0.2).
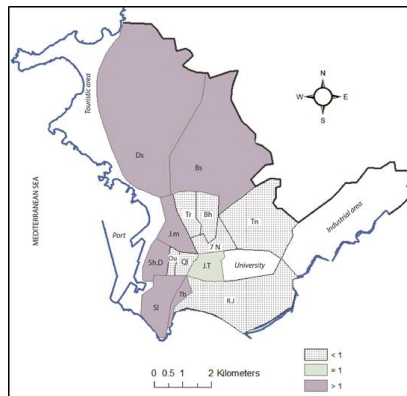

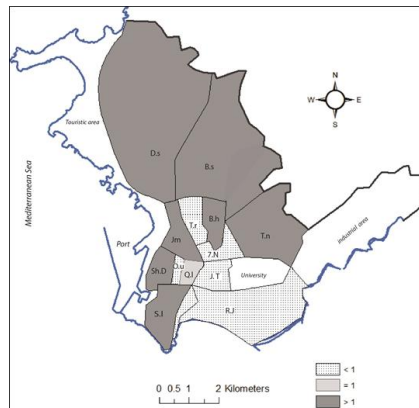**Figure 3:** LQ values for First Stages schools in Lattakia city

Figure 4: LQ values for Second Stage schools in Lattakia city

5.3   Relation population/schools using Lorenz Curve:

Table 3 and figure 5 below show the relation between population and schools. The shape of Lorenz curve indicate that 50% of F.S. schools are enjoyed by about 50% of population, and 50% of S.S. schools are enjoyed by 60% of population.

Table. 3. Lorenz Curve of population and number of schools

| Ward	Pop.	%	% cumulative	F.S. School	%	% cumulative	S.S. Schools	%	% cumulative
Shekh.D.	28522	6.5	6.5	4	6.9	6.9	3	6.7	6.7
Oueneh	14815	3.4	9.9	0	0	6.9	1	2.2	8.9
Slaybeh	54148	12.3	22.2	8	13.8	20.7	7	15.6	24.5
Tabyat	33545	7.6	29.8	8	13.8	34.5	3	6.7	31.2
Qalaat	19733	4.5	34.3	2	3.7	38.2	2	4.4	35.6
R.Jnobi	50329	11.4	45.7	3	5.2	43.4	1	2.2	37.8
Jamet Tishreen	23374	5.3	51	3	5.2	48.6	2	4.4	42.2
Thawra	32104	7.3	58.3	2	3.7	52.9	2	4.4	46.6
Baeth	29387	6.7	65	3	5.2	57.5	4	8.9	55.5
7 Nissan	32563	7.4	72.4	2	3.7	61.2	3	6.7	62.2
Tishreen	18284	4.2	76.6	2	3.7	64.9	2	4.4	66.6
Daatour	27458	6.2	82.8	4	6.9	71.8	3	6.7	73.3
Bisnada	10114	2.3	85.1	2	3.7	75.5	2	4.4	77.7
Jmhourya	42130	9.7	94.8	7	12.2	87.8	7	15.6	93.3
Dmsarkho	20802	4.7	99.5	7	12.2	100	3	6.7	100
Akeibeh	1143	0.3	99.8	0	0	-	0	0	-
Hreshieh	987	0.2	100	0	0	-	0	0	-
Total	439834	100	-	58	100	-	46	100	-
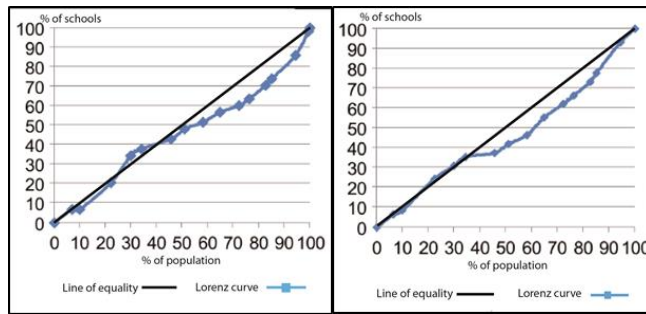
Figure (5) : The shape of Lorenz Curve for F. S. and S.S. schools

5.4   Ratio of schools to population by wards

The Ratio schools/population (1: 10000) is a standard recommended to reveal if city or ward are advantaged when lower, or disadvantaged when higher. The table 4 reveals that the city is advantaged with ratio schools/population for each F.S. and S.S. schools (1:7583, 1: 9744). But this ratio varies between wards, (table 4, figure 6).

Table 4: Ratio F.S. and S.S. schools/population in Lattakia city 2012

Ward	2012 projected pop.	Number of F.S. schools	Ratio to population	Number of S.S. schools	Ratio to population
Shekh-D.	28522	4	7130	3	9507
Oueneh	14815	0	0	1	14815
Slaybeh	54148	8	6768	7	7735
Tabyat	33545	8	4193	3	11181.6
Qalaat	19733	2	9866.5	2	9866.5
R.Jnobi	50329	3	16776	1	50329
Jamet-T.	23374	3	7791	2	11687
Thawra	32104	2	16052	2	16052

Ward	2012 projected pop.	Number of F.S. schools	Ratio to population	Number of S.S. schools	Ratio to population
Baeth	29387	3	9792.7	4	7344.5
7 Nissan	32563	2	16281.5	3	10854.3
Tishreen	18284	2	9142	2	9142
Daatour	27458	4	6864.5	3	9152.7
Bisnada	10114	2	5057	2	5057
Jmhorya	42130	7	6018.6	7	6018.6
Dmsarkho	20802	7	2971.7	3	6934
Akeibeh	1143	-	-	-	-
Hreishieh	987	-	-	-	-
Total	439834	58	7583	45	9744

For the First Stage schools, the ratio reveals that 3 wards are disadvantaged with ratio higher than (1:10000). These are Raml Jnobi, Thawra, and 7 Nissan, having all a close ratio (1:16776), (1:16052), (1:16281.5), and representing 26% of city's inhabitants. The 12 advantaged wards with ratio lower than (1:10000) are varied between Dmsarkho, the most advantaged (1:2971.7), Qalaat (1:9866.5), Baeth (1:9792.7) and Tishreen (1:9142). The remains wards are Tabyat (1:4193), Bisnada (1:5057), Jmhorya (1:6018.6), Daatour (1:6864.5), and Jamet Tishreen (1:7791).

For the Second Stage schools, the ratio reveals that 6 wards are disadvantaged with ratio higher than (1:10000). These are Raml Jnobi, the most disadvantaged (1:50329), followed by Thawra (1:16052), Oueneh (1:14815), Jamet Tishreen (1:11687), Tabyat (1: 11181.6), 7 Nissan (1:10854.3), representing 46.6% of city's inhabitants. The 9 advantaged wards varies between Bisnada (1:5057) the most advantaged, followed by Jmhorye (1:6018.6), Dmsarkho (1:6934), Baeth (1:7344.5), Slaybeh (1:7735), Tishreen (1:9142), Daatour (1:9152), Shekh-D. (1:9507), Qalaat (1:9866.5).
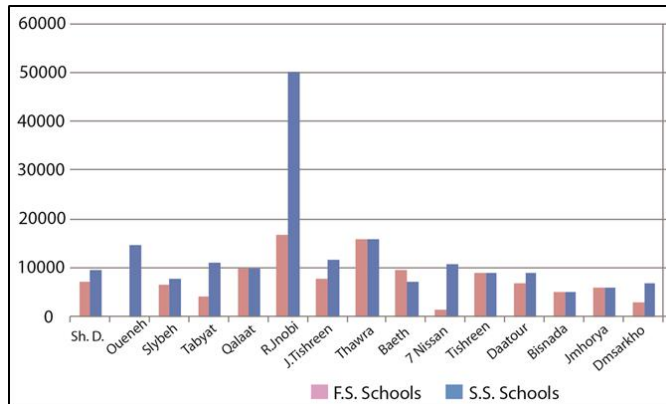

Figure 6: Ratio of schools to population in Lattakia city

6.   Conclusion and Recommendations

This study unveiled the existing of the problem of inequality and adequacy of the spatial distribution between different wards of Lattakia city, where some of wards are very advantaged at the neglect of others very disadvantaged and deficient. In these wards suffering lack we can investigate about the rates of overcrowding or school dropout and the effects on the quality of education that weaken the human and economic development of the urban society, not only in these wards but also in all the city. To resolve this problem, the provision of schools should be made more equitable throughout the city with effective population – related planning policies. There is an urgent need for intervention of the service of city planners and government to take the necessary to provide lands in order to construct more schools or expanding the capacity of the existing ones, and encourage the small private schools.

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