DEPARTMENT OF URBAN AND
REGIONAL PLANNING, BUET

Spatial Distribution of Public Facilities in the Districts of Bangladesh

Course No.- PLAN-434
Course Title: Regional Planning Studio

Submitted by-

Group: 2

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Level-4/Term-1

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Analysis of Spatial Distribution of Public Facilities in the 64 Districts of Bangladesh

Public Facilities	
1. Primary School	▪ Government Primary School ▪ Registered Primary School ▪ Private (Non- Registered) Primary School
2. Secondary School	▪ Government Secondary School ▪ Non-government Secondary School
3. College	▪ Government College ▪ Non-government College ▪ Joint School and College
4. Private Hospital and Clinic	
5. Government Health Complex	
6. Growth Center	
7. Rural Market (Hat/Bazar)	

Data Collection: District Statistics Report, BBS 2011

Analysis of Spatial Distribution of Public Facilities in the 64 Districts of Bangladesh

Method	**Rationale**
Location Quotient Method	Identify the districts which are deficient and sufficient in terms of public facilities
Weighted Index Method	Formal regionalization based on LQ value
Gini Index Method	Identify the inequality of spatial distribution of facilities
Pearson Correlation Test	Correlation test between public facilities and population

Location Quotient Method

$$L.Q. = (n_i / p) / (N_i / P)$$

Where,

n_i = number of facility i in a given district

p = population of the district

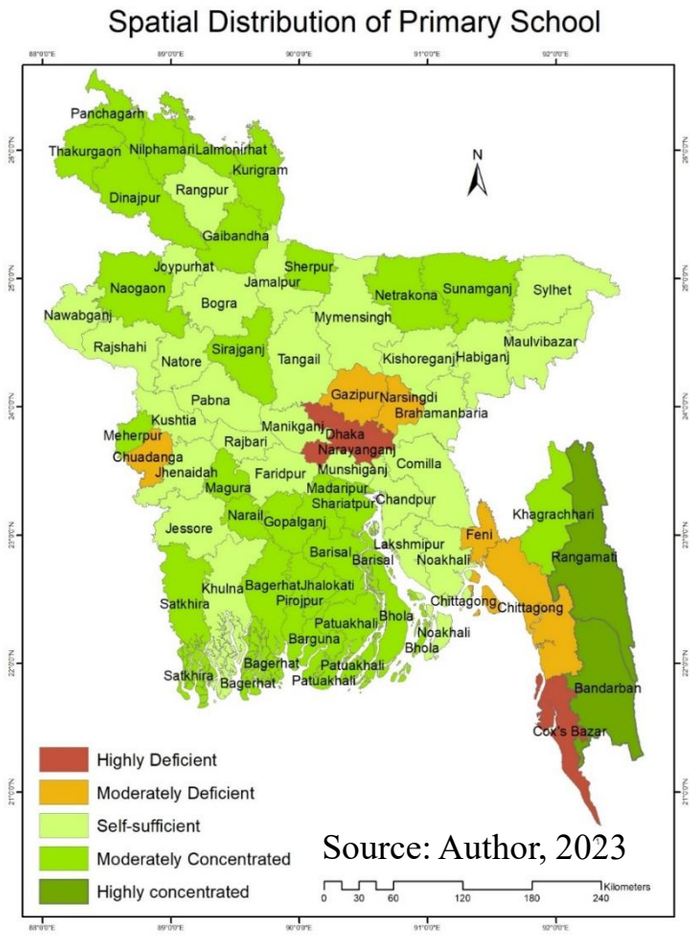
N_i = number of facility i in Bangladesh

P = total population of Bangladesh

LQ Value Range	Rank
0-0.49	Highly Deficient
0.49-0.85	Moderately Deficient
0.85-1.2	Self Sufficient
1.2-2	Moderately Concentrated
Above 2	Highly Concentrated

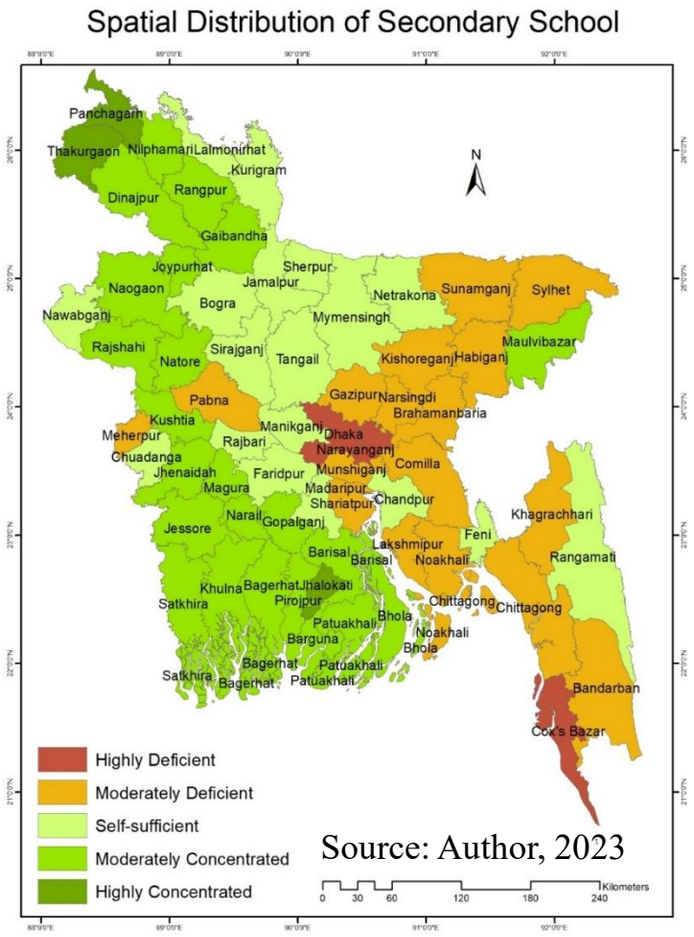
Amin & Tamima, 2008

Spatial Distribution of Educational Facilities in the Districts



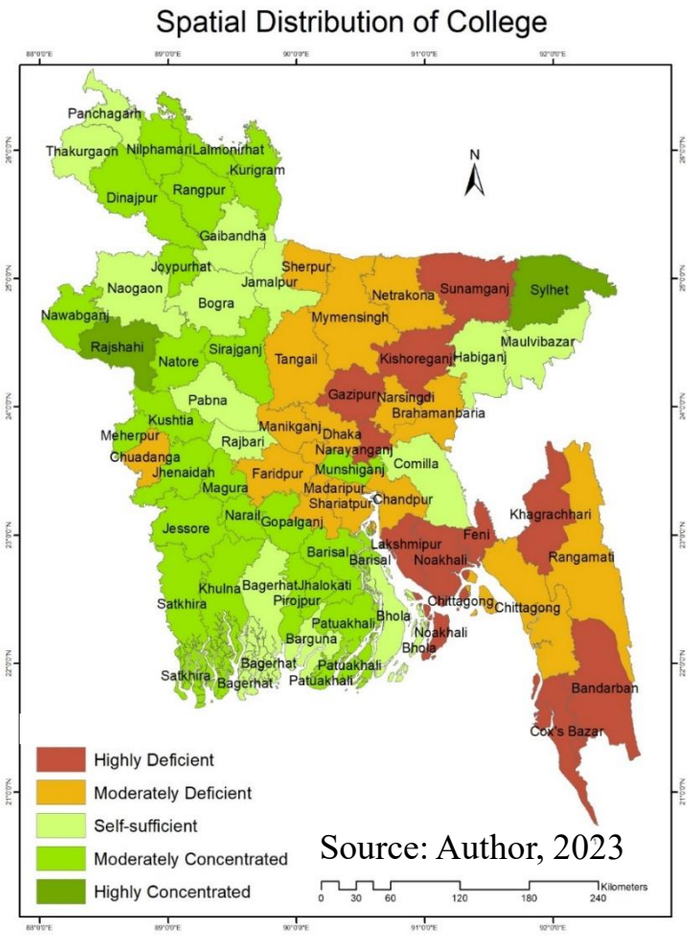
Highly Deficient:

Dhaka, Narayanganj, Cox's Bazar



Highly Deficient:

Dhaka, Narayanganj, Cox's Bazar

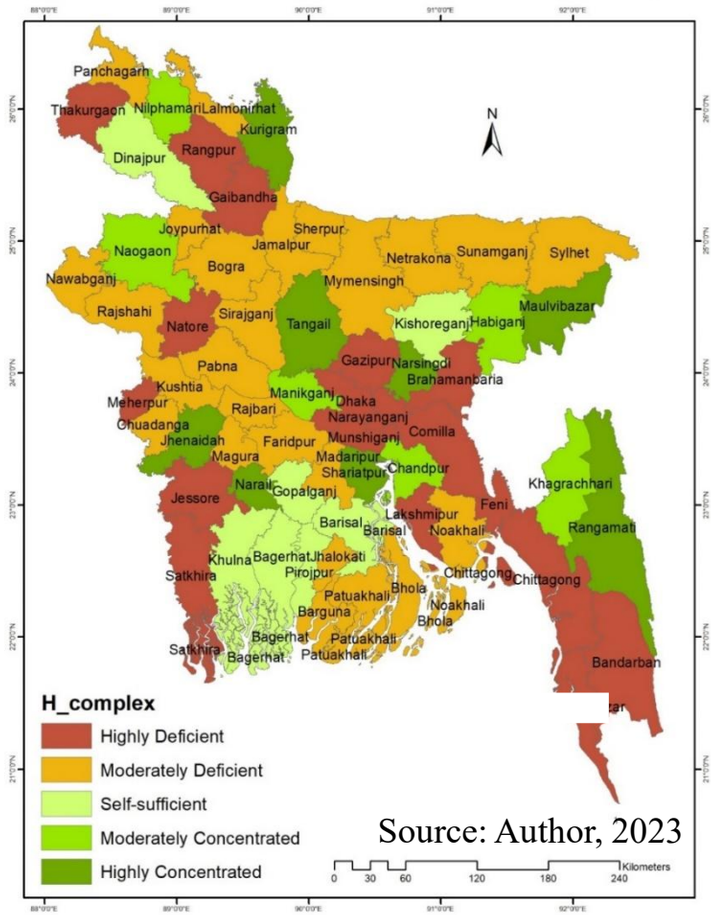


Highly Deficient:

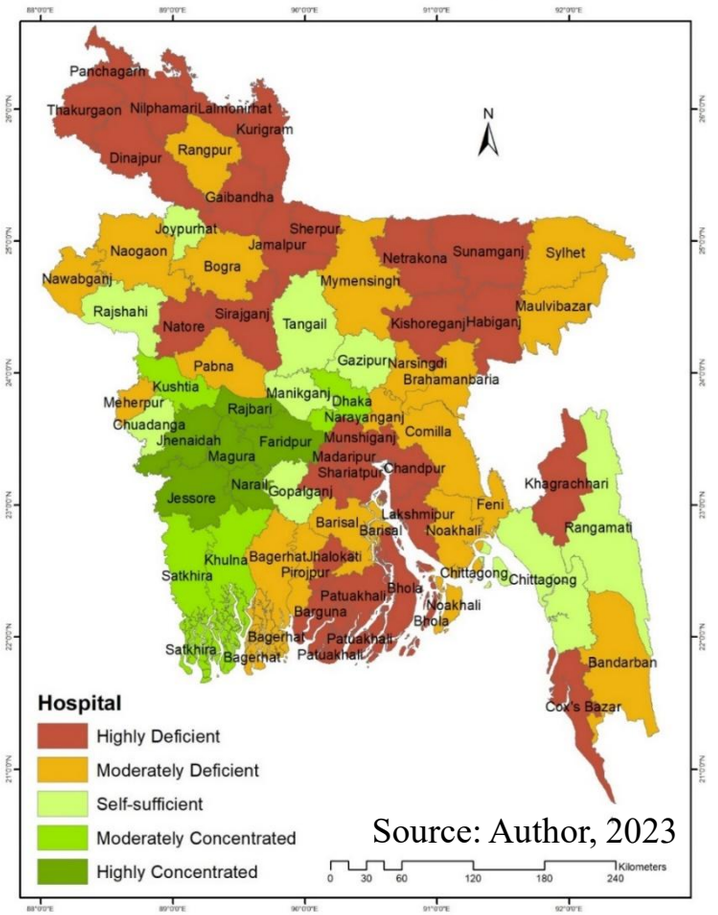
Narayanganj, Cox's Bazar, Bandarban, Khagrachhari, Feni, Noakhali, Lakshmipur, Gazipur, Kishoreganj, Sunamganj

Spatial Distribution of Health Facilities in the Districts

Spatial Distribution of Government Health Complex



Spatial Distribution of Private Hospital and Clinic

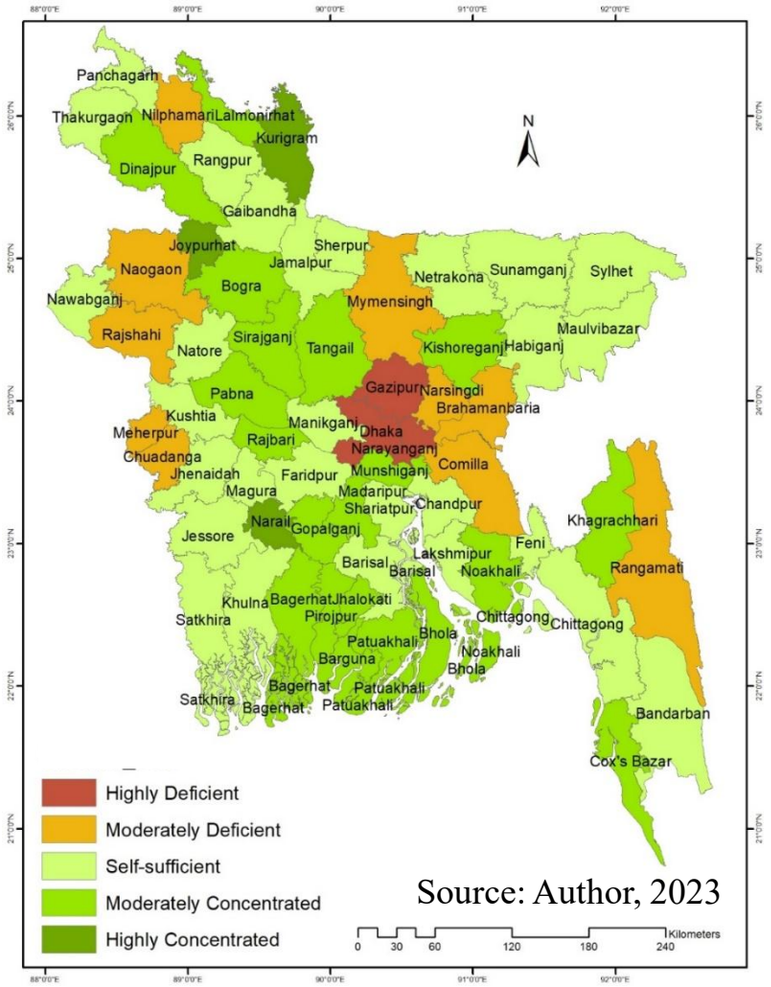


Highly Deficient: Dhaka, Narayanganj, Munshiganj, Gazipur, Cumilla, Cox's Bazar, Bandarban, Feni, Lakshmipur, Brahamanbaria, Meherpur, Natore, Gaibandha, Rangpur, Thakurgaon, Jessore, Satkhita

Highly Deficient: Munshiganj, Madaripur, Shariatpur, Chandpur, Lahshmipur, Natore, Gaibandha, Khagrachhari, Cox's Bazar, Bhola, Patuakhali, Barguna, Kishoreganj, Sunamganj, Habiganj, Netrokona, Sirajganj, Jamalpur, Sherpur, Kurigram, Dinajpur, Panchagar

Spatial Distribution of Community Facilities in the Districts

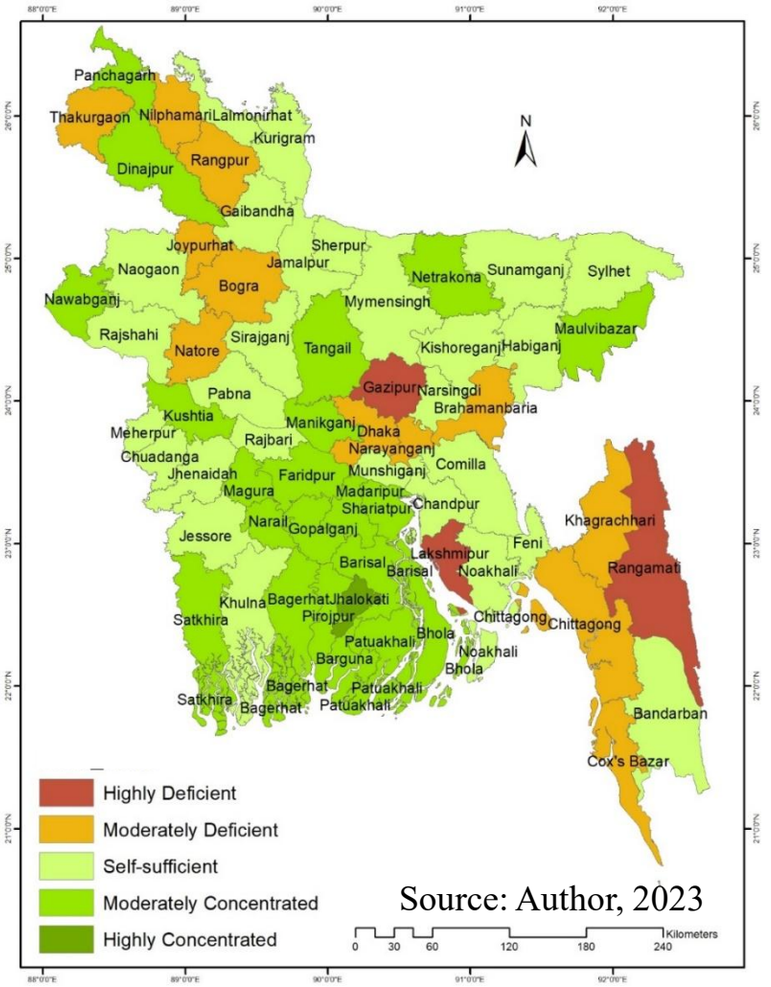
Spatial Distribution of Growth Center



Highly Deficient:

Dhaka, Narayanganj, Gazipur

Spatial Distribution of Rural Market



Highly Deficient:

Gazipur, Lakshmipur, Rangamati

Formal Regionalization of the Districts based on Spatial Distribution of Public Facilities

Weighted Index Method

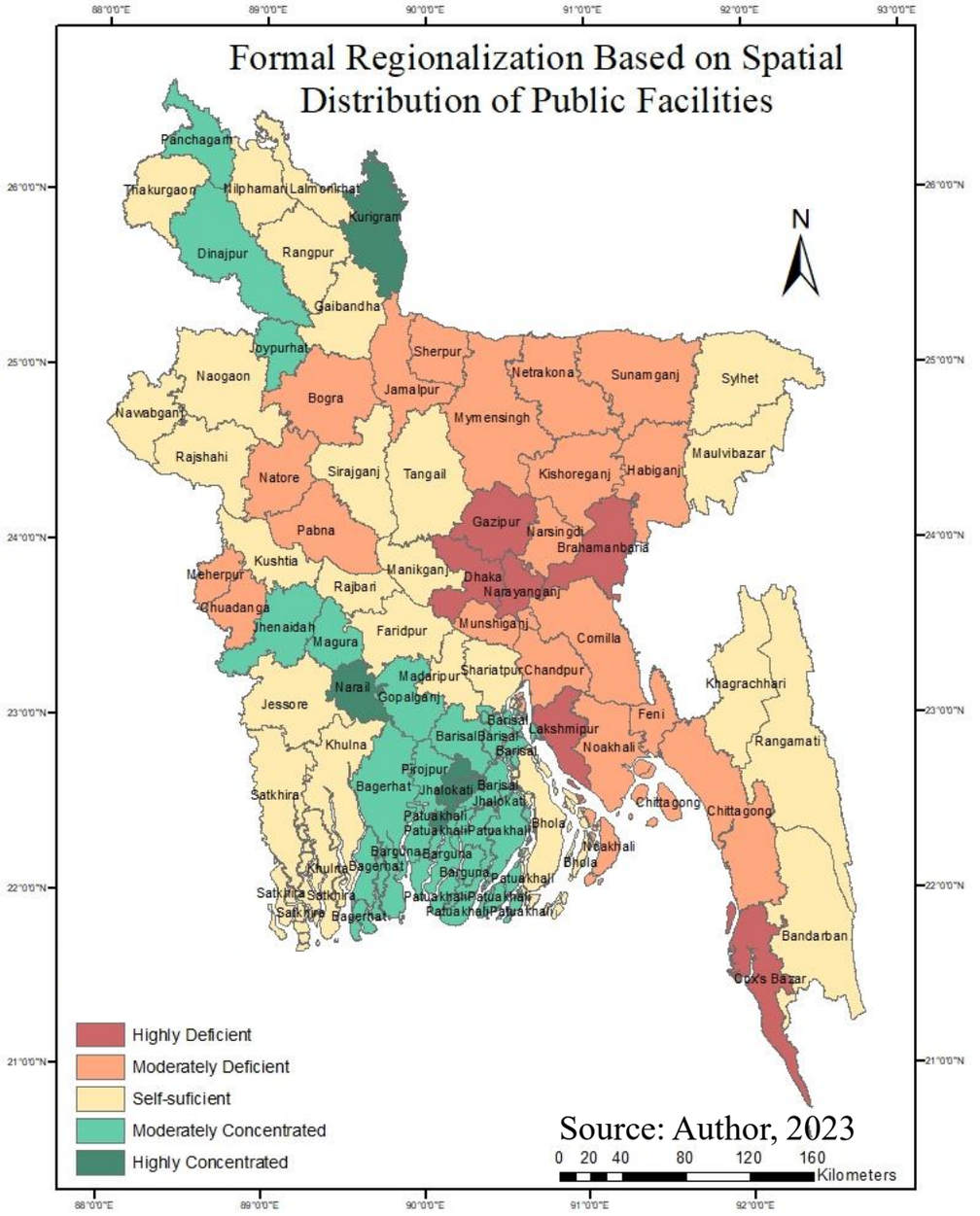
x_{1-7}= Location Quotient Value of Public Facilities (Primary school, Secondary School, College, Private hospital/ Clinic, Upazila Health Complex, Growth Center, Rural Market)

$$W_n = \frac{\text{Mean of } X_n}{\text{Standard deviation of } X_n} \qquad \text{Where, n= 1,2,3,....7}$$

$$W = \frac{X_{1*}w_1 + X_{2*}w_2 + X_{3*}w_3 + X_{4*}w_4 + X_{5*}w_5 + X_{6*}w_6 + X_{7*}w_7 +}{w_1 + w_2 + w_3 + w_4 + w_5 + w_6 + w_7}$$

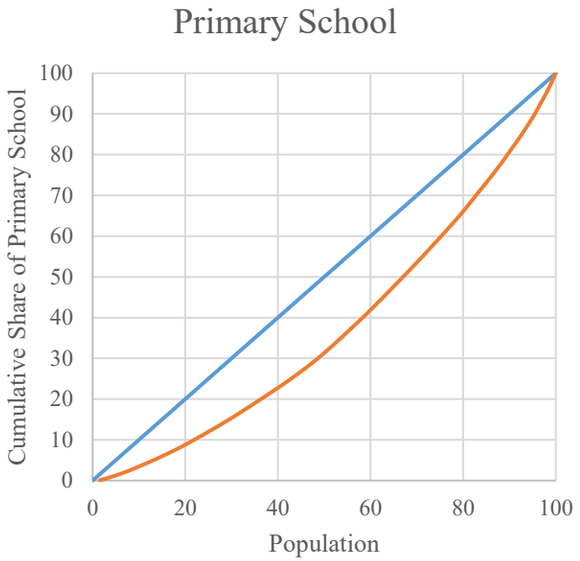
$$X = \frac{\text{Highest Value} - \text{Lowest value}}{\text{Number o Class Required}}$$

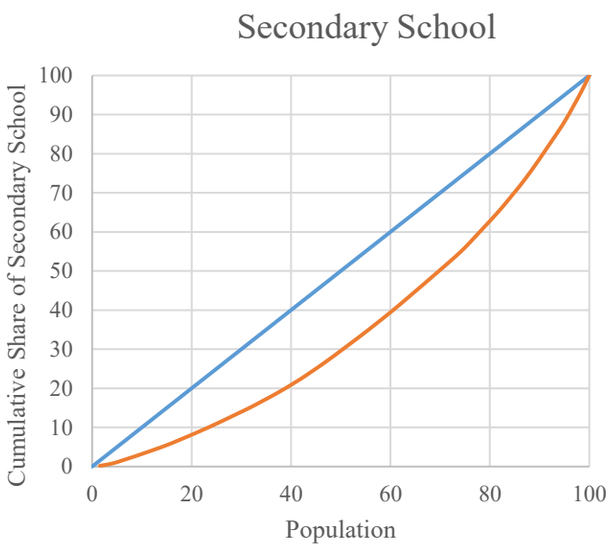
Islam et al., 2018

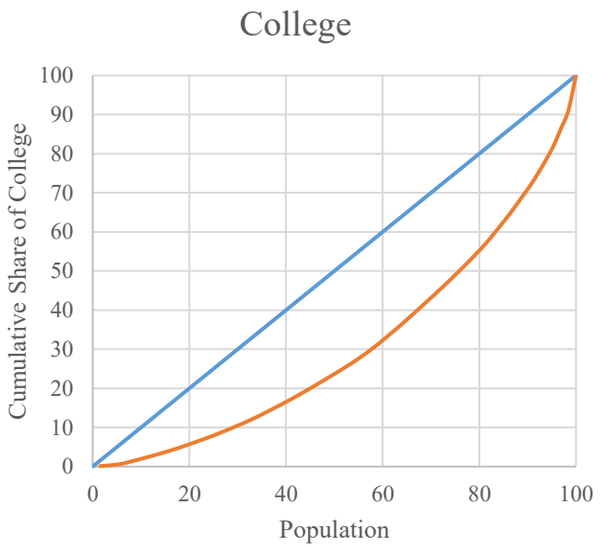


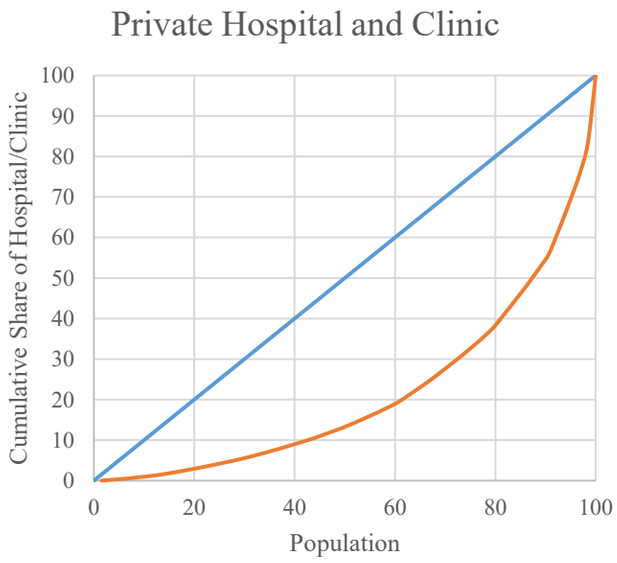
Gini Index of Public Facilities in terms of Spatial Distribution

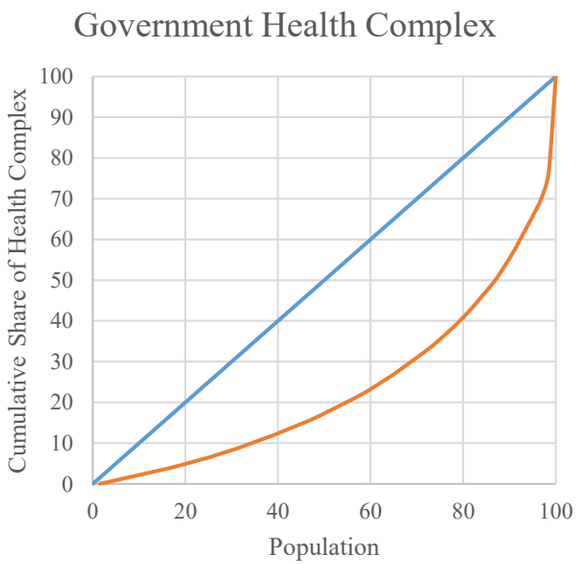
Facilities	Gini Index
Primary School	0.26
Secondary School	0.29
College	0.39
Private Hospital/Clinic	0.57
Govt. Health Complex	0.53
Growth Center	0.29
Rural	0.30

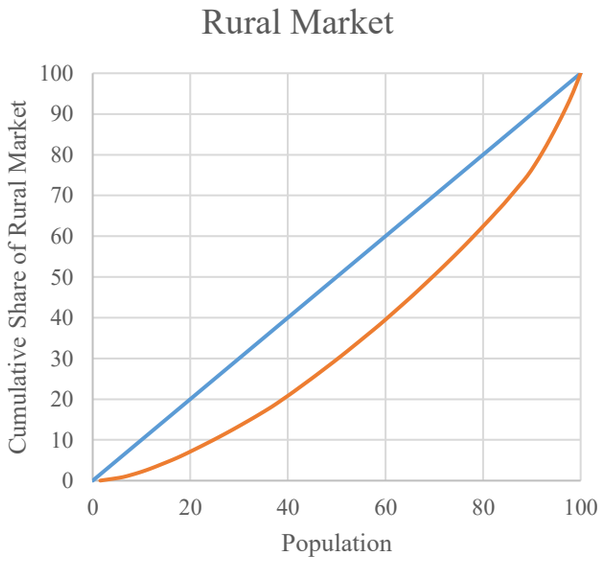






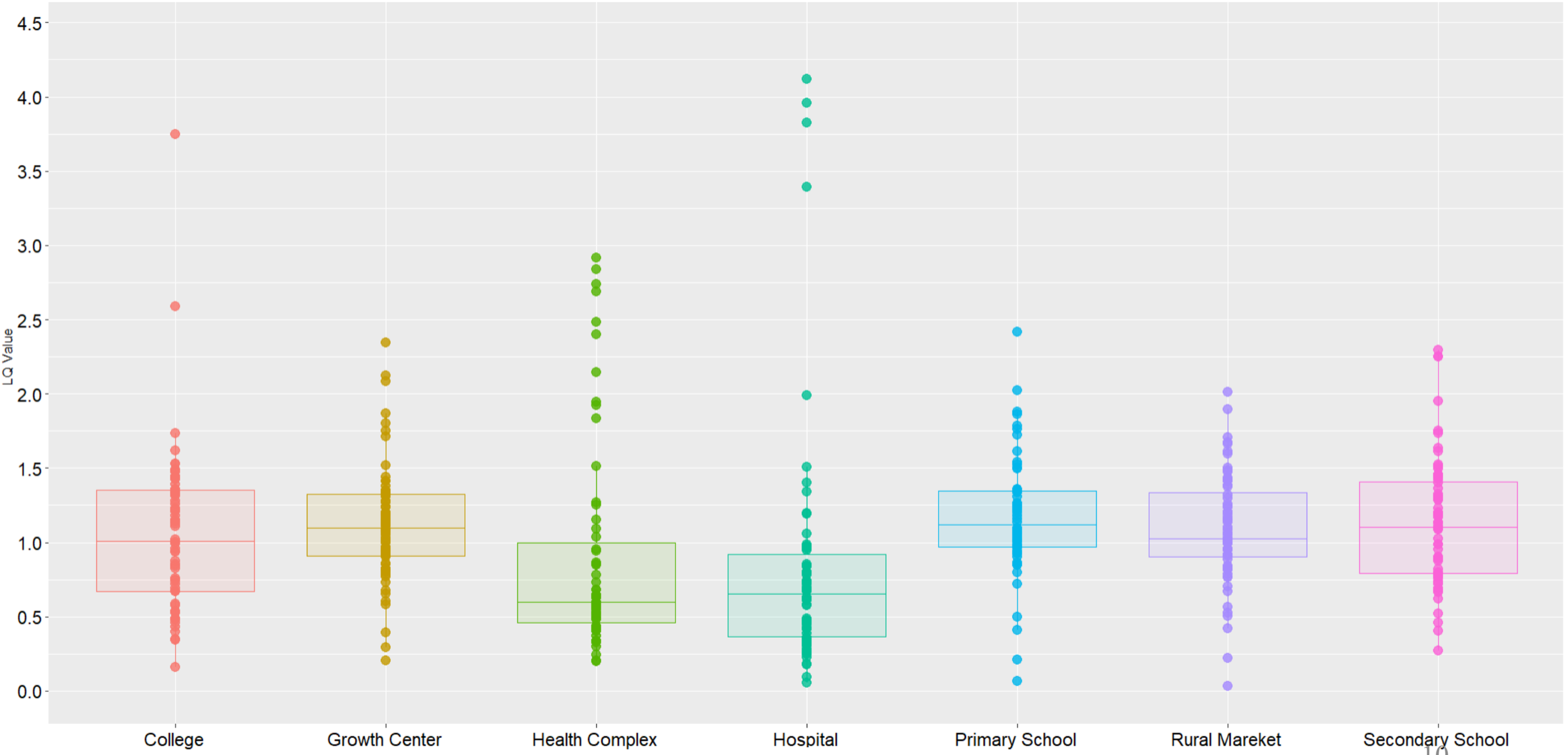






Equality Line Lorenz Curve

Spatial Distribution of Public Facilities



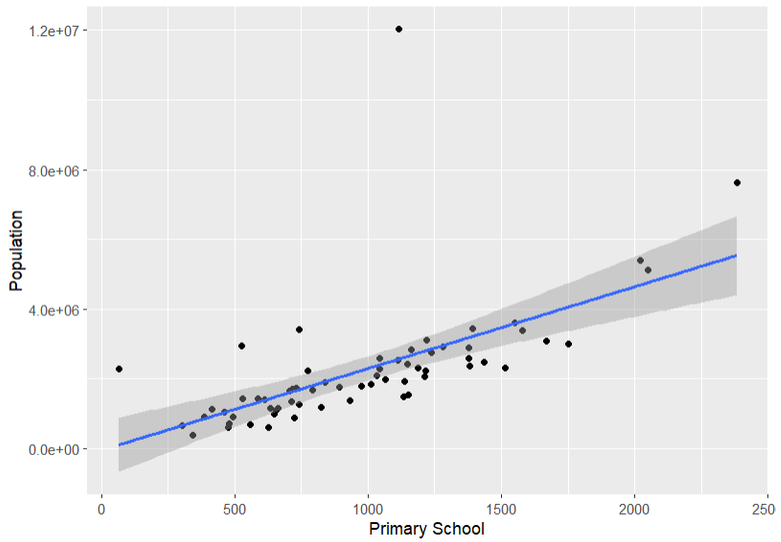
Source: District Statistics 2011

Pearson Correlation Test							
	Primary School	Secondary School	College	Private hospital/ Clinic	**Government Health Complex**	Growth Center	Rural Market
P Value	8.154e-08<0.05	7.489e-08<0.05	9.012e-07<0.05	8.317e-13<0.05	**0.3596 >0.05**	1.018e-06<0.05	2.2e-16<0.05
Result	Significant	Significant	Significant	Significant	**Insignificant**	Significant	Significant

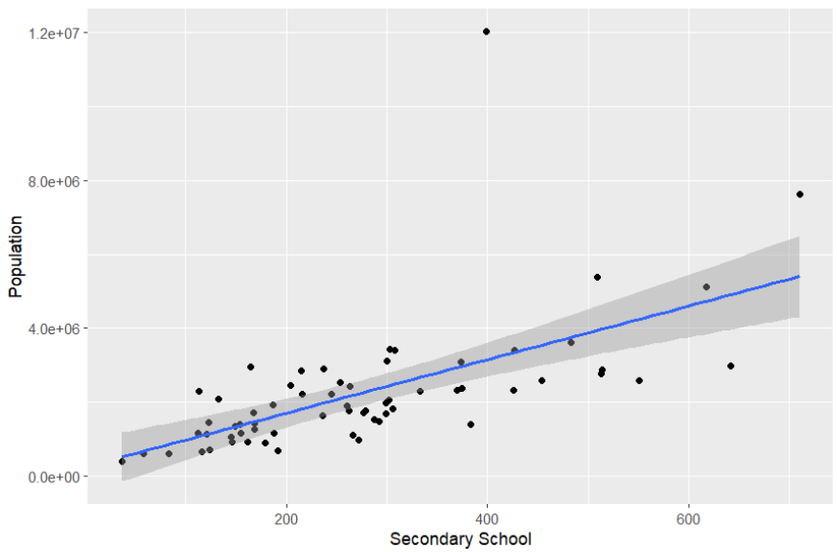
P value<0.05, Significant; P value>0.05 Insignificant

Graphical Representation of Linear Relationship Test between Population and Public Facilities

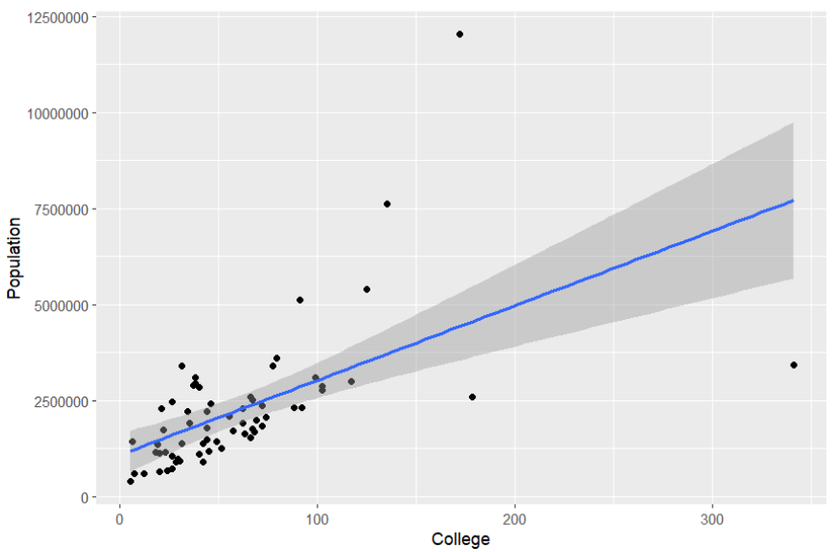
Primary School



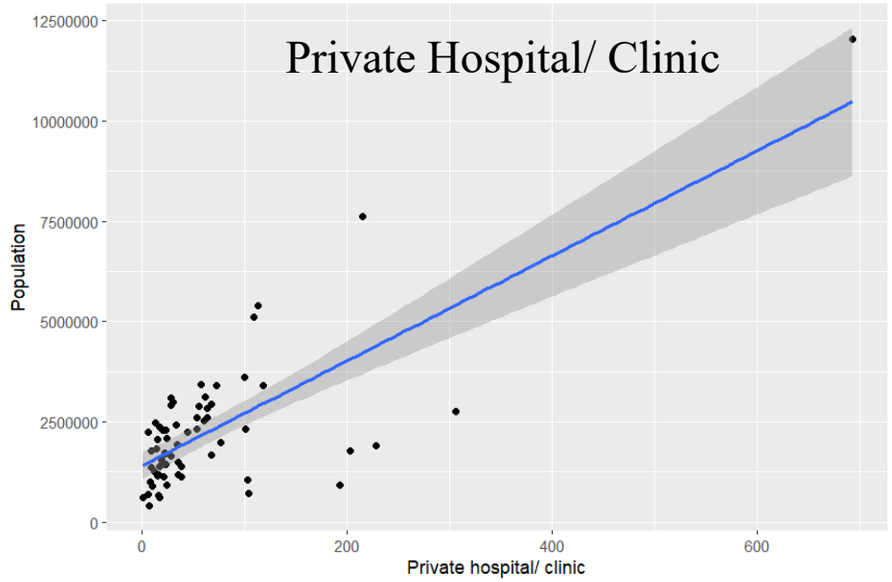
Secondary School

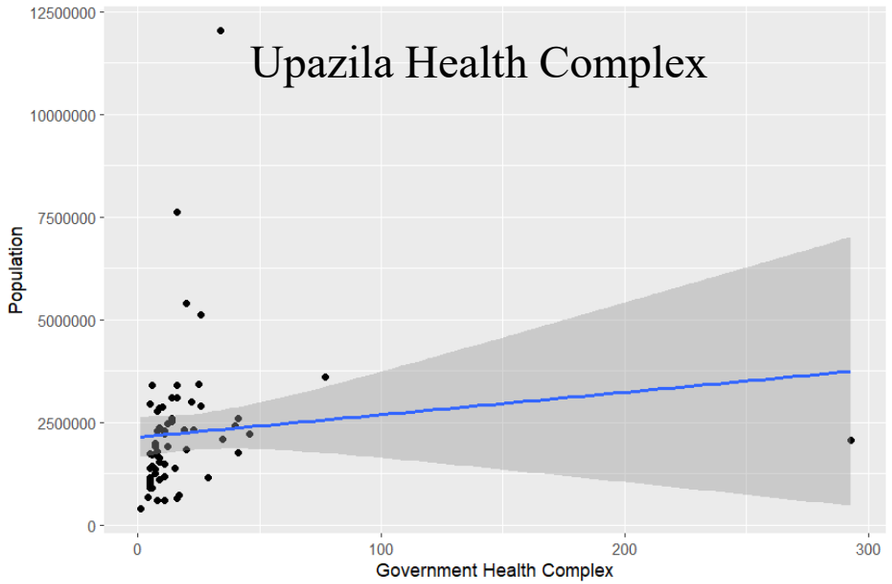


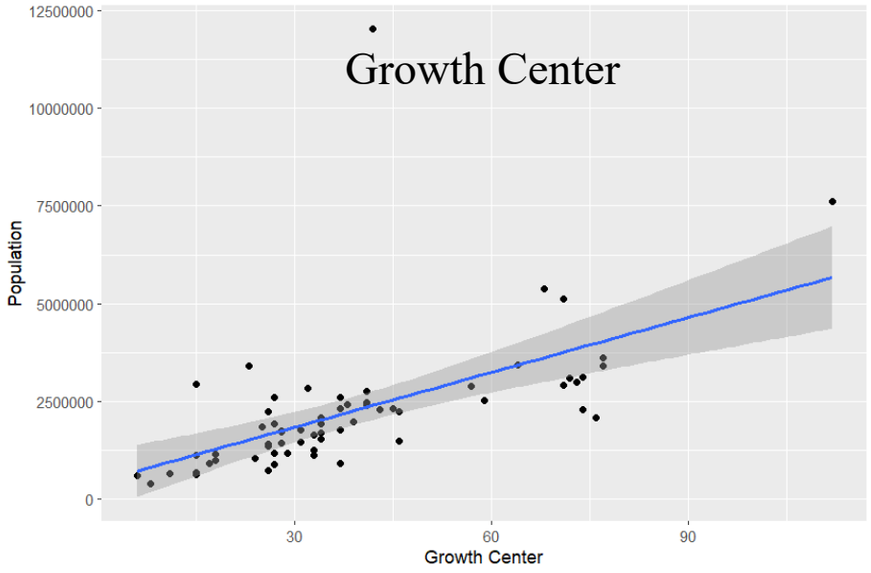
College

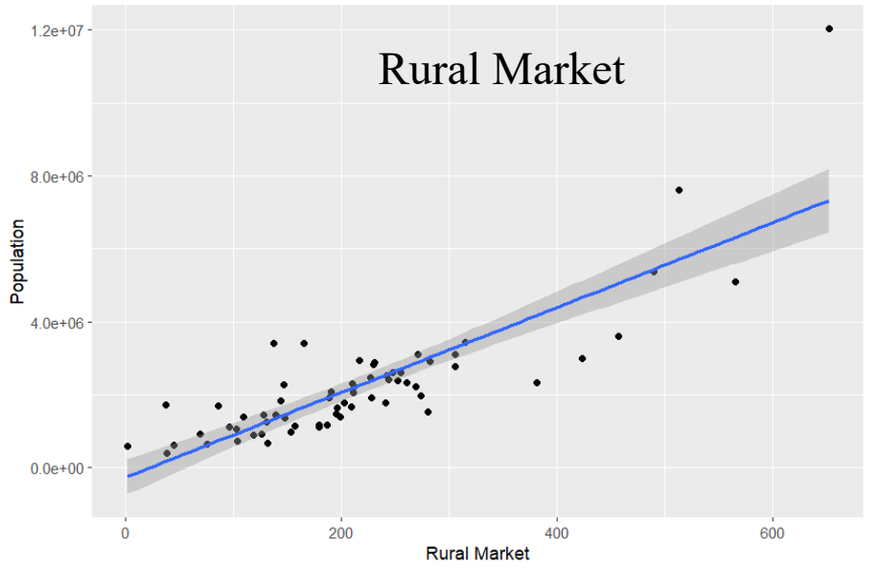


Graphical Representation of Linear Relationship Test between Population and Public Facilities









Ranking of the Districts based on LQ values of Public Facilities in Different Divisions of Bangladesh

Division	District	Primary School	Secondary School	College	Private Hospital	Health Complex	Growth Center	Rural Market	LQ Sum	Rank
Dhaka	Faridpur								9.92	1
	Gopalganj								9.52	2
	Rajbari								9.36	3
	Tangail								8.91	4
	Shariatpur								8.32	5
	Manikganj								7.54	6
	Madaripur								7.15	7
	Narsingdi								7.11	8
	Munshiganj								6.03	9
	Kishoreganj								5.96	10
	Dhaka								4.1	11
	Gazipur								3.8	12
	Narayanganj								3.41	13
Rajshahi	Joypurhat								8.72	1
	Rajshahi								8.36	2
	Naogaon								7.97	3
	Nawabganj								7.24	4
	Sirajganj								6.73	5
	Pabna								6.67	6
	Bogura								6.05	7
	Natore								5.9	8

Highly Deficient	Moderately Deficient	Self Sufficient	Moderately Concentrated	Highly Concentrated

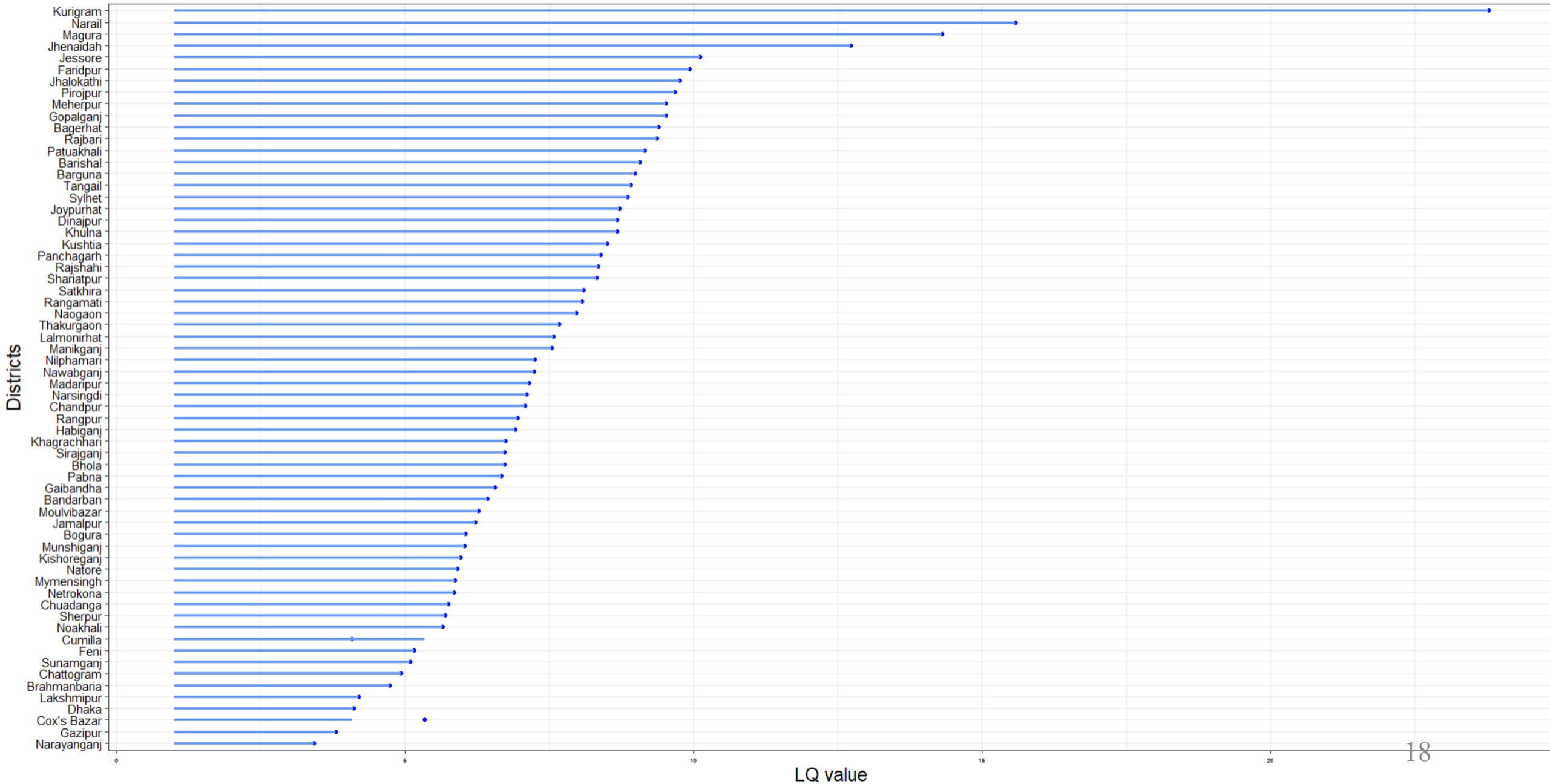
Division	District	Primary School	Secondary School	College	Private Hospital	Health Complex	Growth Center	Rural Market	LQ Sum	Rank
Chittagong	Rangamati								8.06	1
	Chandpur								7.07	2
	Khagrachari								6.73	3
	Bandarban								6.42	4
	Noakhali								5.65	5
	Cumilla								5.34	6
	Feni								5.16	7
	Chittagong								4.92	8
	Brahmanbaria								4.73	9
	Lakhsmipur								4.2	10
	Cox’s Bazar								4.07	11
Khulna	Narail								15.59	1
	Magura								14.3	2
	Jhenaidah								12.73	3
	Jessore								10.11	4
	Meherpur								9.52	5
	Bagerhat								9.39	6
	Khulna								8.67	7
	Kushtia								8.49	8
	Satkhira								8.09	9
	Chuadanga								5.75	10

Highly Deficient	Moderately Deficient	Self Sufficient	Moderately Concentrated	Highly Concentrated

Division		Primary School	Secondary School	College	Private Hospital	Health Complex	Growth Center	Rural Market	LQ Sum	Rank
Sylhet	Sylhet								8.86	1
	Habiganj								6.9	2
	Moulvibazar								6.27	3
	Sunamganj								5.08	4
Barishal	Jhalakhati								9.77	1
	Pirojpur								9.67	2
	Patukhali								9.16	3
	Barishal								9.07	4
	Barguna								8.99	5
	Bhola								6.71	6
Rangpur	Kurigram								23.79	1
	Dinajpur								8.67	2
	Panchagarh								8.4	3
	Thakurgaon								7.67	4
	Lalmonirhat								7.57	5
	Nilphamari								7.25	6
	Rangpur								6.95	7
	Gaibandha								5.55	8
Mymensingh	Jamalpur								6.2	1
	Mymensingh								5.87	2
	Netrokona								5.84	3
	Sherpur								5.7	4

Highly Deficient	Moderately Deficient	Self Sufficient	Moderately Concentrated	Highly Concentrated

Ranking of the 64 Districts based on LQ Value of Public Facilities



Required Educational Facilities Based on Threshold Population

Educational Facilities	Population Threshold
Primary School	5000
Secondary School	7,000
College	52,600

Jahan & Oda, 2000

District	Required Primary School (%)
Cox's Bazar	**86%**
Dhaka	53%
Narayanganj	11%

Required Educational Facilities Based on Threshold Population

District	Required Secondary School (%)
Bandarban	33%
Bogura	12%
Brahmanbaria	47%
Chandpur	24%
Cumilla	35%
Cox's Bazar	34%
Dhaka	**77%**
Faridpur	5%
Feni	18%
Gazipur	37%
Habiganj	55%

District	Required Secondary School (%)
Kishoreganj	43%
Lakshmipur	32%
Lalmonirhat	6%
Madaripur	7%
Manikganj	23%
Moulvibazar	32%
Munshiganj	40%
Mymensingh	15%
Narayanganj	**61%**
Narsingdi	32%

District	Required Secondary School (%)
Khagrachari	34%
Netrokona	23%
Noakhali	32%
Pabna	30%
Rajbari	3%
Rangamati	3%
Shariatpur	32%
Sherpur	23%
Sirajganj	15%
Sunamganj	**42%**
Sylhet	38%
Tangail	6%

Required Educational Facilities Based on Threshold Population

District	Required College (%)
Bamdarban	32%
Brahmanbaria	26%
Chattogram	7%
Chuadanga	7%
Cox’s Bazar	51%
Dhaka	24%
Faridpur	4%
Feni	**78%**
Gazipur	52%
Khagrachari	40%

District	Required College (%)
Kishoreganj	33%
Lakshmipur	33%
Mymensingh	6%
Narayanganj	32%
Netrokona	20%
Noakhali	36%
Shariatpur	18%
Sherpur	26%
Sunamganj	**45%**

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Thank You