

Chapter 04

Urban Readiness

- Concept of Urban Readiness
- Urban Readiness Matrix
- Matrix of Normalized Urban Readiness
- Urban Readiness Iso-quant Curve/Line
- Numerical Expression of Urban Readiness
- Urban Readiness and Suitability
- Spatial Urban Group (SUG)

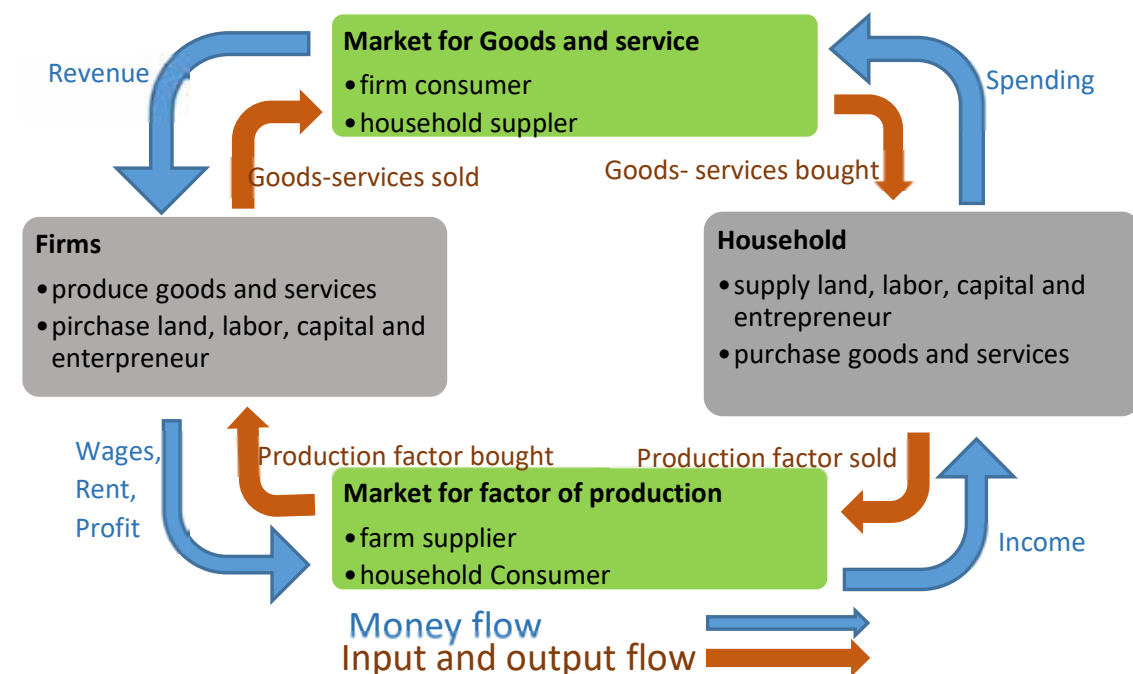
Concept of Urban Readiness

This chapter explains the combined scenario of growth center considering infrastructure-services suitability along with ecological suitability. In order to overlay these two suitability the growth centers urban function is synthesized from production and consumption perspective. According to neo-classical economics, there are 4 (four) primary factors of production, these are: land, labor, entrepreneur and capital. About 80% growth centers (345 no) have land area (including urban and rural) between 100 to 400 sqkm (See Figure-16). Distribution of land resource is almost even. It is assumed that availability of land factor has less effect on variability of growth centers urban character. So, this study does not include this factor. Urban population is the main source of labor in urban centers. This study considered only urban population as indicator of labor factor. Third factor is the level of entrepreneurship. This study considered utmost administrative level of growth center as proxy variable for entrepreneurship factor due to data unavailability. According to neoclassical economics, the capital includes any means of input which helps producer to produce further goods. It can be financial capital, infrastructure like transport and communication or services like administrative, educational or financial institutes. There are 9 (nine) variables of Infrastructure and service, (other than urban population and utmost administrative level) correspond to capital stock of growth center (See Figure-17) in production perspective an urban area is more suitable if it has higher production possibilities. This study assumes from the economic point of view that, urban suitability considering infrastructure -service is the comparative distribution of production factor. Growth center with higher urban suitability has higher factor of production and higher production possibility. Now, the efficiency of production factor, land, labor, capital is directly affected by the ecological variables and

entrepreneurship is indirectly affected. The scope of this study is limited to urban, so agriculture or other farming issues are not considered. It is assumed that ecological sensitivity negatively affects the efficiency of production factor as well as reduces the production possibility of growth center. So, growth center with less ecological sensitivity or higher ecological suitability has higher possibility to achieve expected production outcome.

As like as production, consumption is determined by several factors one of them is the choice of consumers. The choice of consumers is affected by income and market situation. Income draws the budget line for a consumer and market situation limits its choice according to budget. Now the question is whether this two suitability affects the income and market situation in an urban economy. An economic system can easily be visualized with the circular-flow diagram model.

Figure-21: Circular flow diagram



Adopted from Principles of Macroeconomics by N. Gregory Mankiw, 6th Edition

An economy consists of two inter-related markets. One is market of goods and services and another is market of factors of production. There are two types of consumer in these two markets, farm and household. In factors of production market, farms pay household to purchase land, labor, capital and entrepreneurs. In goods and service market, households pay farm to purchase products of farm. So, in conventional economic system farms spend money in factor of production market as a consumer and do income in goods-service market as supplier. Households spend money in goods-service market as consumer and do income in factor of production market as supplier.

From economic point of view, infrastructure-service variable represents the supply capacity of growth center in these two markets. The circular-flow diagram model shows that income of consumer and choice are determined by the market situation. This study assumes that suitability of infrastructure-service variable represents the better income and freedom of choice for consumer in the market of a growth center. As ecological suitability variables can directly affect the production possibility, so it also affects the market supply and indirectly affect the consumer. The fundamental assumption of this study is, urban potentiality of growth center is positively related to infrastructure-service suitability and negatively related to ecological sensitivity. Ecological suitability has been calculated as opposite of ecological sensitivity of growth center. So ecological suitability is also positively related to urban potentiality of growth center. Before any superimposition of these two suitability this study graphically plotted them in separate diminutions as a matrix form.

Urban Readiness matrix

All 484 growth centers have been plotted in a 'xy' graph to understand the comparative status of each center. Horizontal position of growth center represents infrastructure-service suitability and vertical position represents ecological suitability. A circle has been drawn centering the plotted growth center. The size of each circle is proportional to their urban population. Color of the circle represents the division and symbol at the center of the plotted growth center represents the highest administrative level. It has been observed that there is no growth center with ecological suitability index below 50. The graphical representation of all 484 growth centers clearly represents the disparity among them from ecological and Infrastructure-service dimension.

Matrix : 01 Urban Readiness Matrix and Growth Center of Bangladesh with Urban Population

Legend

Administration Type

- ▲ Capital
- City Corporation HQ
- ◆ District_HQ
- ✕ Paurashava_HQ
- Upazila_HQ

Axis

- Ecological Suitability 00
- Ecological Suitability 100
- Ecological Suitability 50
- Infrastructure-Service Suitability 00
- Infrastructure-Service Suitability 100
- Infrastructure-Service Suitability 50

Division

- 10 Barishal
- 20 Chattogram
- 30 Dhaka
- 40 Khulna
- 50 Rajshahi
- 60 Rangpur
- 70 Sylhet
- 80 Mymensingh

Size of the circle represents urban population of growth center

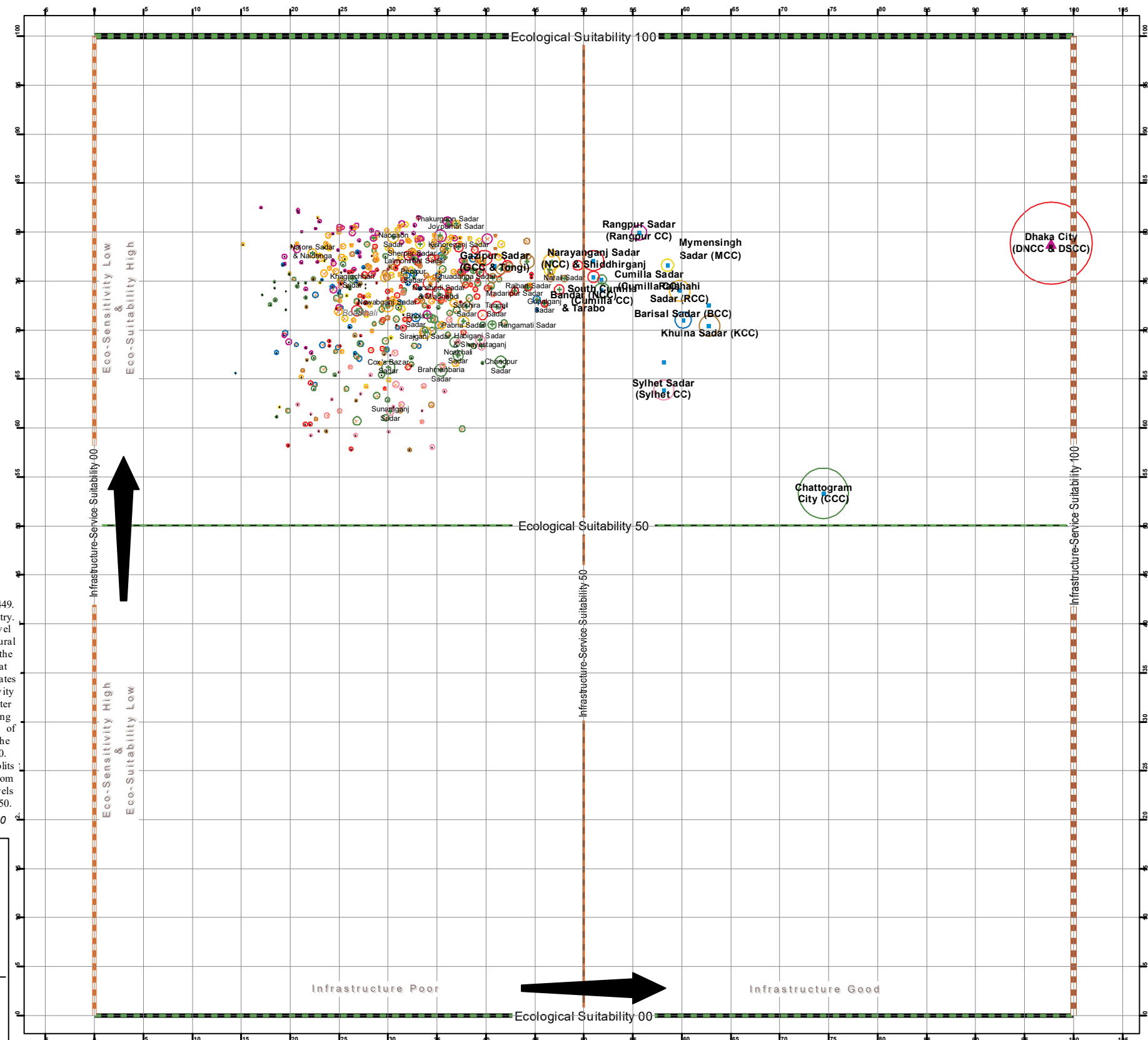
According to BBS, 2011 total urban population of Bangladesh is 3,46,42,449. This population is not uniformly distributed among 484 growth center of the country. Different growth center has different geological character with different level of risk from numerous hazards. Development pattern especially infrastructural of different urban center are not similar. This graph represents the Infrastructural suitability at horizontal (X) axis and ecological suitability at vertical (Y) axis for each urban center. Horizontal position toward right end indicates suitable infrastructure and virtually up-ward position represents less sensitivity to geological or ecological hazard for growth centers. Circle size of each center represents the urban population size. Color of the circle represents the corresponding Division and symbol at the center represents the administrative level of the urban center according to the legend. Horizontal middle line splits the growth centers with ecological suitability score above 50 and score below 50. As well as considering the infrastructural suitability, vertical middle line splits the growth center with score above 50 (right side of the middle line) from growth center score below 50 (Left side of the middle line). This xy plot reveals that there is no growth center where eco-suitability score is less than 50.

Compiled by: GIS Lab, UDD 2020



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Matrix of Normalized Urban Readiness

This graph represents the urban readiness matrix in normalized form. Growth centers are plotted according to normalized infrastructural suitability score at horizontal (X) axis and normalized ecological suitability score at vertical (Y) axis. Normalized score represents contribution of each growth center considering aggregate national score as 10,000. As example infrastructural suitability score of Dhaka is 97.74 in scale of 100. But normalized infrastructural suitability score is 64.07 in scale of 10,000. In this study sum of normalized suitability score of 484 growth center is 10,000. Horizontal middle line splits the growth centers with ecological sensitivity score above 50 and score below 50 in scale of 10,000. As well as considering the infrastructural suitability, vertical middle line splits the growth center with score above and below 50 in scale of 10,000. The graph shows that comparative association of growth center is same as non-normalized matrix. Only difference between normalized and non-normalized matrix is collectiveness of growth center. When data is not normalized each growth center is scored individually in the scale of 100. But when it is normalized, then the score of growth center is associated with each other.

Matrix : 01 (a) Normalized Urban Readiness Matrix and Growth Center of Bangladesh with Urban Population

Legend

Administration Type

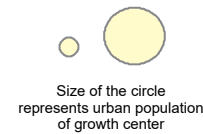
- ▲ Capital
- City Corporation HQ
- ◆ District_HQ
- ✕ Paurashava_HQ
- Upazila_HQ

Axis

- Normalized Ecological Suitability 00 in 10,000
- Normalized Ecological Suitability 100 in 10,000
- Normalized Ecological Suitability 50 in 10,000
- Normalized Infrastructure-Service Suitability 00 in 10,000
- Normalized Infrastructure-Service Suitability 100 in 10,000
- Normalized Infrastructure-Service Suitability 50 in 10,000

Division

- 10 Barishal
- 20 Chattogram
- 30 Dhaka
- 40 Khulna
- 50 Rajshahi
- 60 Rangpur
- 70 Sylhet
- 80 Mymensingh



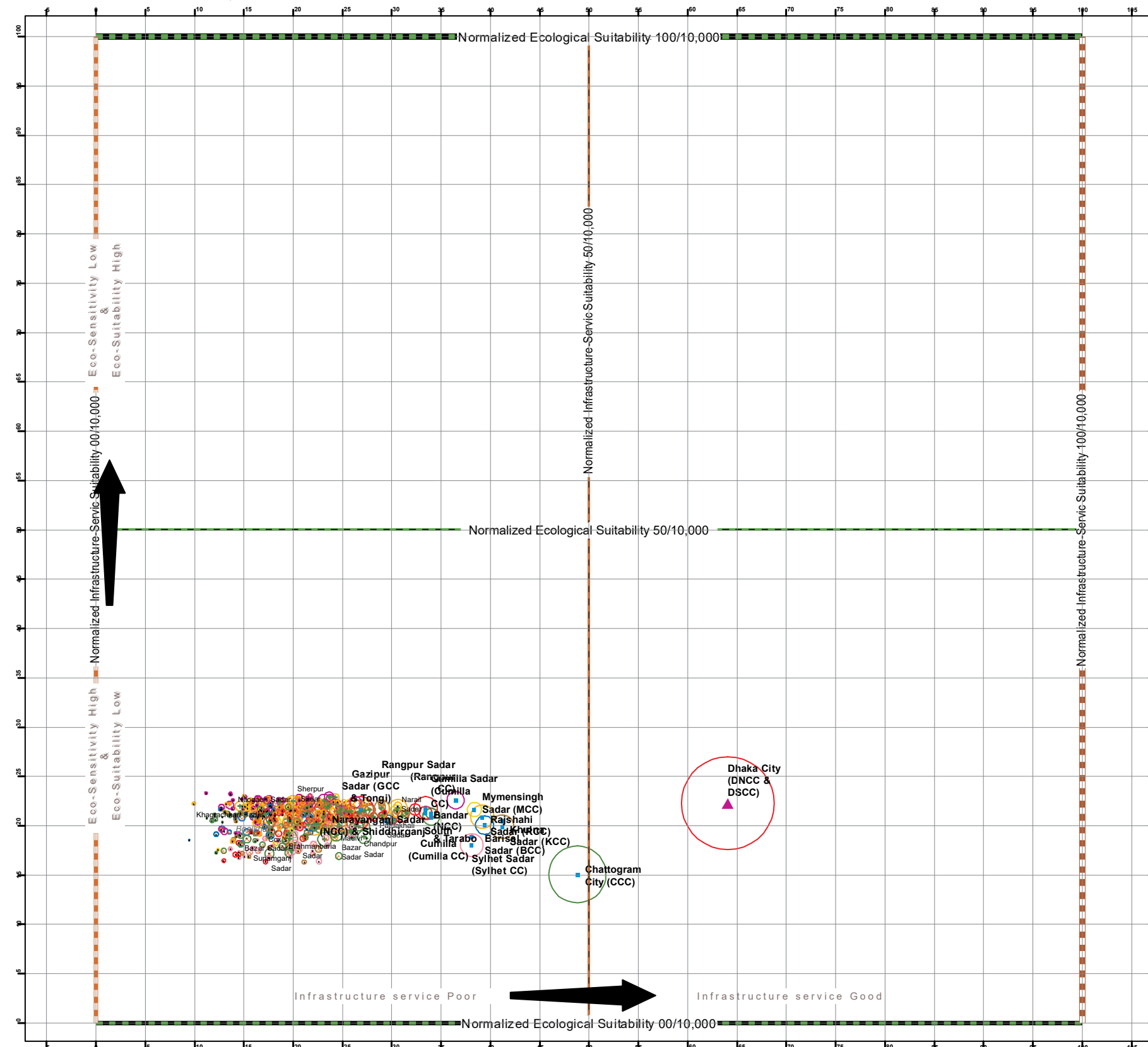
This graph represents the normalized Infrastructural suitability score at horizontal (X) axis and normalized ecological suitability score at vertical (Y) axis for each growth center. Normalized score represents contribution of each growth center considering aggregate national score as 10,000. As example Infrastructural suitability score of Dhaka is 97.74 in scale of 100. But normalized Infrastructural suitability score is 64.07 in scale of 10,000. In this study sum of normalized suitability score of 484 growth center is 10,000. Horizontal position toward right end indicates suitable infrastructure and virtually up-ward position represents less sensitivity to geological or ecological hazard for growth centers. Circle size of each center represents the urban population size. Color of the circle represents the corresponding division and symbol at the center represents the administrative level of the urban center according to the legend. Horizontal middle line splits the growth centers with ecological sensitivity score above 50 and score below 50 in scale of 10,000. As well as considering the infrastructural suitability, vertical middle line splits the growth center with score above and below 50 in scale of 10,000.

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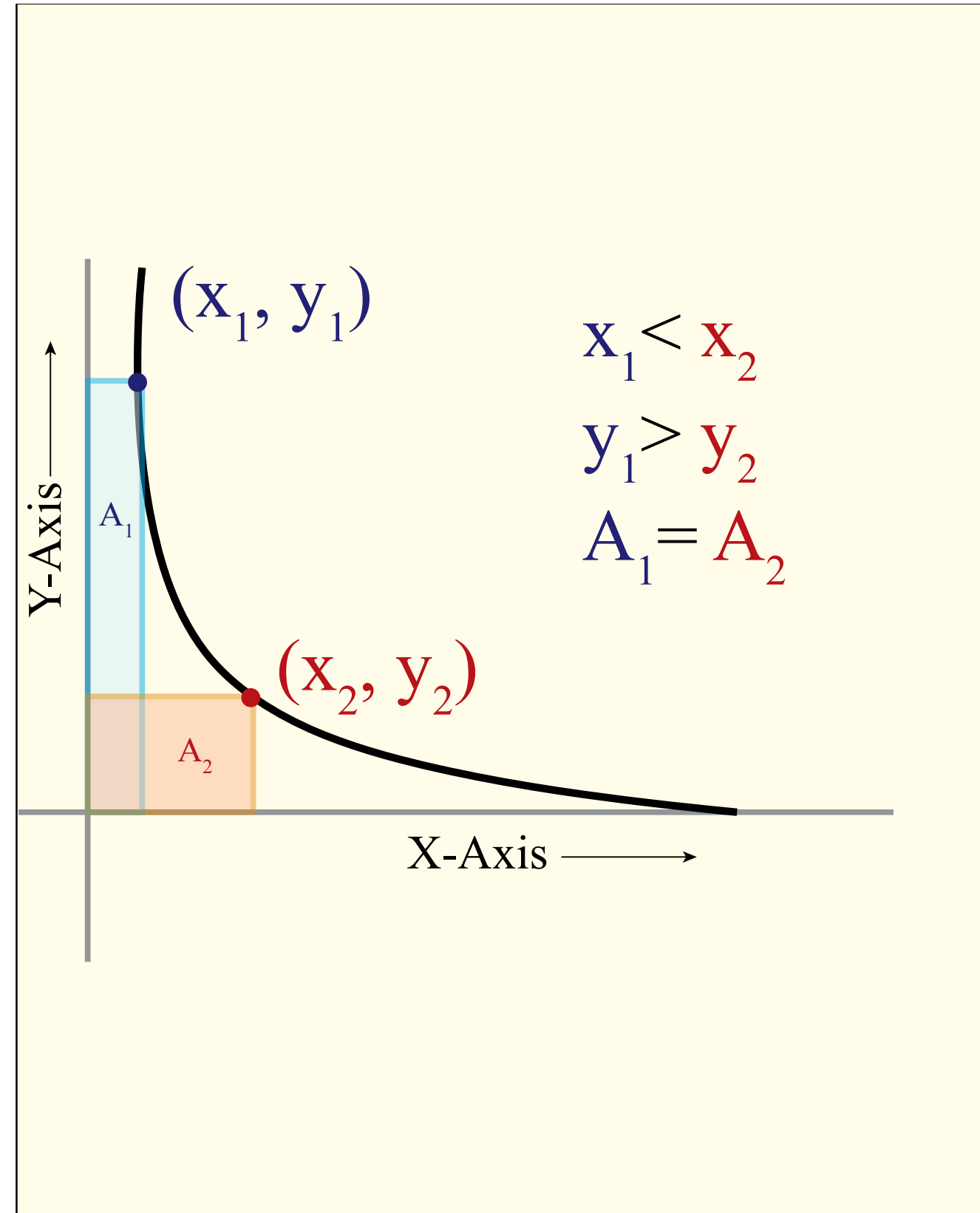
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Urban Readiness Iso-quant Curve-Line

This graphical representation allows to adapt geometrical function to better describe their internal disparity. Iso-quant is an effective function to represent inter-connectivity between the two dimensions. Any point on an iso-quant line creates same area between the axis. So, each point on an iso-quant line represents equal compatibility considering different combination of the two dimensions. In this study, the same method has been used to find hypothetical line, where different combination of ecological suitability and infrastructure-service suitability derive equal outcome from economic perspective. In this study, this iso-quant line has been defined as Urban Readiness iso-quant curve/line. So now urban readiness is graphically represented as urban suitability considering ecological and infrastructure-service of growth center all together.

Figure 22 : Illustration of Iso-quant Curve/Line



Matrix : 02 Urban Readiness Matrix and Growth Center of Bangladesh with Readiness Iso-quant Line

Legend

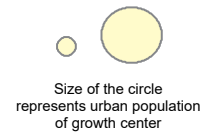
Administration Type

- ▲ Capital
- City Corporation HQ
- ◆ District_HQ
- ✕ Paurashava_HQ
- Upazila_HQ
- Readiness Iso-quant Curve/Line

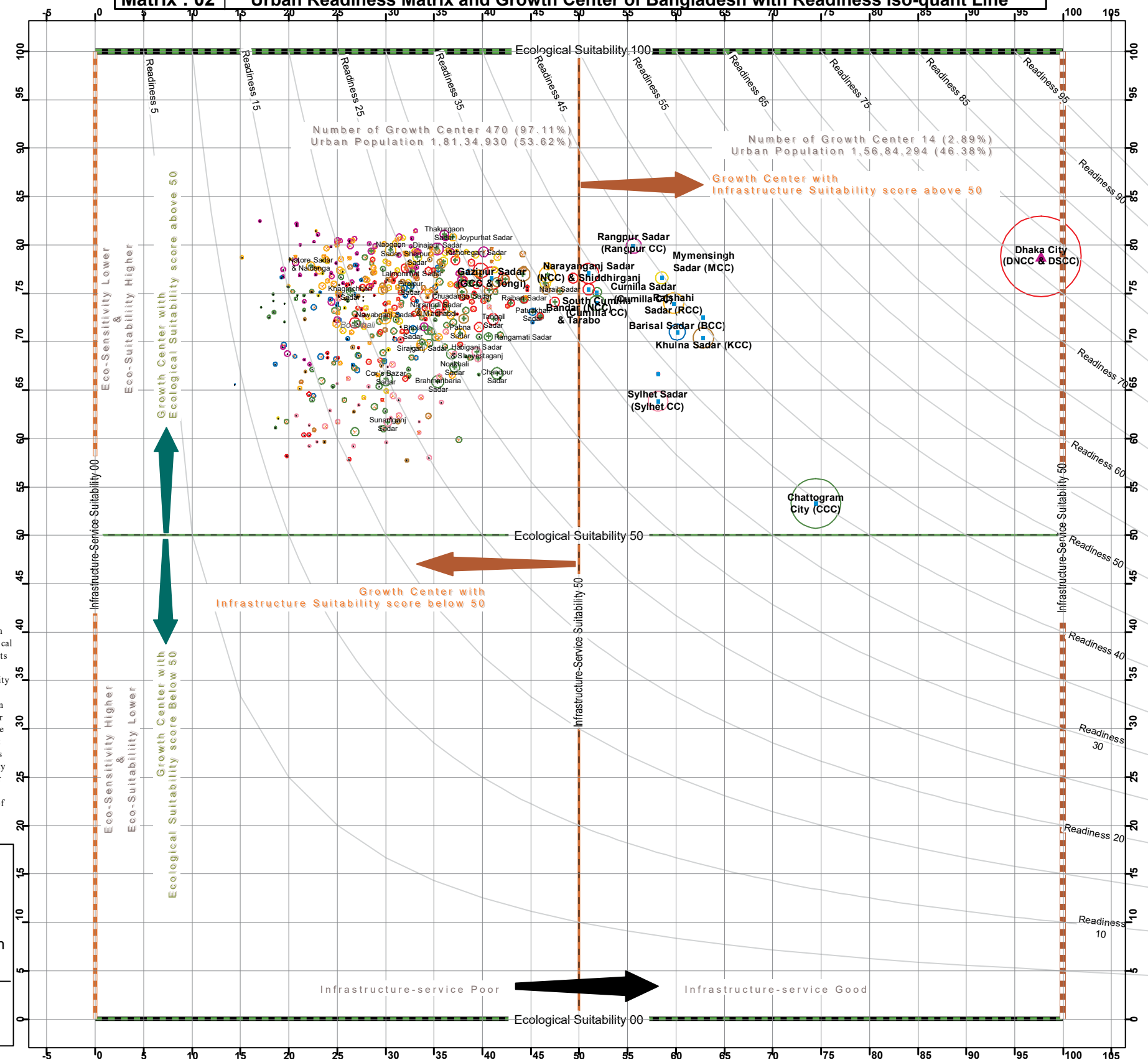
- █ Ecological Suitability 00
- █ Ecological Suitability 100
- █ Ecological Suitability 50
- █ Infrastructure-Service Suitability 00
- █ Infrastructure-Service Suitability 100
- █ Infrastructure-Service Suitability 50

Division

- 10 Barishal
- 20 Chattogram
- 30 Dhaka
- 40 Khulna
- 50 Rajshahi
- 60 Rangpur
- 70 Sylhet
- 80 Mymensingh



Urban readiness is plotted as iso-quant curve/line which is convex to the origin. Growth centers on same readiness curve has same readiness score. Slope at each point of a readiness curve represents marginal rate of substitution between ecological suitability and infrastructure suitability. The convex relationship represents that, between two growth center on a same readiness iso-curve, growth center with lower ecological suitability requires higher infrastructure-service suitability to derive same readiness. So policy requirement for these two growth centers must be different from each other. Ecological suitability of a growth center can not be changed, but risk sensitive urban planning and policy can overcome their fragility and ensure sustainable development. This graph represents the Infrastructural suitability at horizontal (X) axis and ecological suitability at vertical (Y) axis for each urban center. Horizontal position toward right end indicates suitable infrastructure and virtually up-ward position represents less sensitivity to geological or ecological hazard for growth centers. Circle size of each center represents the urban population size. Color of the circle represents the corresponding Division and symbol at the center represents the administrative level of the urban center according to the legend. *Compiled by: GIS Lab, UDD 2020*





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Urban Readiness Matrix

Numerical expression of urban readiness

Graphical representation makes it possible to describe urban readiness numerically. Suitability score for both ecology and infrastructure-services is ranging from 0 to 100. Infrastructure suitability represents the existing condition of urban commodity within a growth center. So, ideally a growth center with infrastructure and service suitability score of 100 has all the urban commodities possible in the country perspective. From economic point of view, this ideal growth center has possibility to return the highest outcome. It can be described in other way. If 100 unit of resources is provided in this ideal growth center, the outcome will be the highest in the existing system. Suppose, ideal growth center can provide outcome of (K) units for the input of 100 units. Then consider a growth center which has the infrastructure-service suitability score of 60 and 100 units are invested there. The understanding is, the outcome from investment in this growth center will be (60/100) or 60% of ideal growth centers outcome (K). For the given example, it will be (0.6*K) unit or (K*(60/100)) unit. Logic is same for ecological-suitability. Suppose, the ideal growth center has ecological-suitability score of 70 among 100, the understanding is the outcome (K) of providing 100 units in the ideal growth center will be (K *70/100) unit or 70% of (K). Now, again consider the other growth center, it has possibility to produce outcome of (0.6*K) unit for providing 100 units. Suppose this growth center has eco-suitability score of 50. So incorporating eco-suitability with infrastructure-service suitability the total outcome will be 50/100 or 50% of (K*(60/100)), which is (K*(60/100) *(50/100)) unit or (0.3 * K) unit.

So, let redefine the combined suitability again

A growth center has,

Infrastructure-service suitability score = 60

Eco-Suitability score = 50

Suppose K =1 and we provide 100 unit of input.

Outcome is,

Considering only Infrastructure-service suitability = 60/100 or 0.6

Considering only Eco suitability = 50/100 or 0.5

Considering both of them = (60/100) *(50/100) or 0.3 per unit

for every 100 unit of inputs outcome is= 100 x 0.3 or 30 unit

so the combined output is also in the scale of 100

=Urban Readiness score of 30

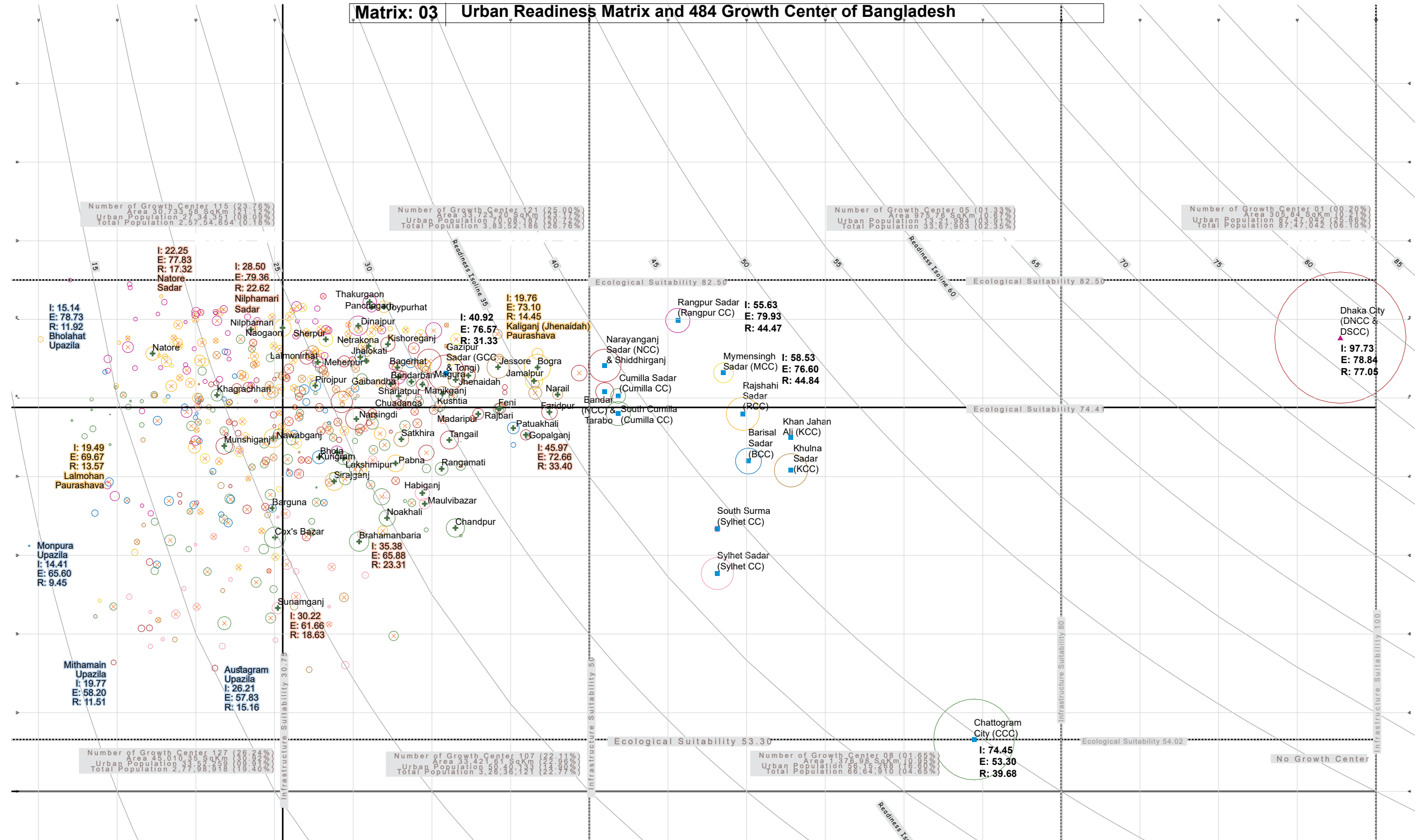
So, Urban Readiness is multiplication of urban suitability and ecological-suitability.

Urban Readiness index

=Urban suitability index considering infrastructure & service

×(Urban suitability index considering ecology)/100

Matrix: 03 Urban Readiness Matrix and 484 Growth Center of Bangladesh



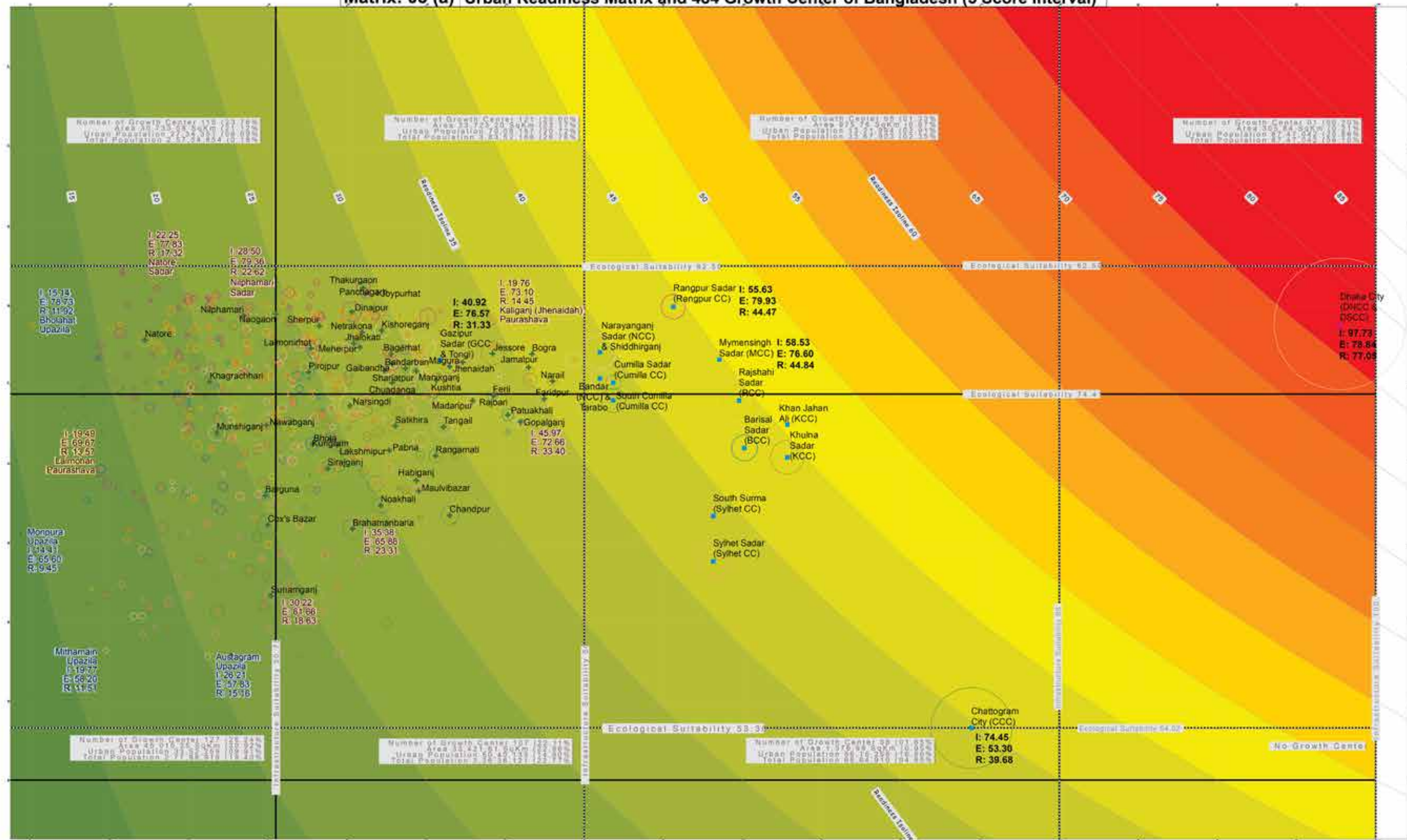
Size of the circle represent urban population of growth center

I: Infrastructure-Service Suitability
E: Ecological Suitability
R: Readiness Score

City Corporation Name
District HQ Name
Paurashava Name
Upazila Name

All 484 Growth centers of Bangladesh are graphically classified in to 8 distinct spatial Urban Groups (SUG). Urban readiness plotted as iso-curve suggests growth centers on same readiness curve has same readiness score. The convex relationship represents that, between two growth center on a same readiness iso-curve, growth center with lower ecological suitability requires higher infrastructure-service suitability to derive same readiness. This graph represents the Infrastructural suitability at horizontal (X) axis and geological sensitivity at vertical (Y) axis for each urban center. Horizontal position toward right end indicates suitable infrastructure and virtually up-word position represents less sensitivity to geological or ecological hazard for growth centers. Circle size of each center represents the urban population size. Color of the circle represents the corresponding Division and symbol at the center represents the administrative level of the urban center according to the legend. Horizontal middle line by ecological suitability score of 71.25 splits the 484 growth centers with 242 ecologically less suitable and 242 ecologically more suitable growth centers. Vertical middle line by suitability score 33.75 splits the 484 growth centers with 242 less suitable to infrastructure-service and 242 more suitable growth centers. Higher suitable 242 growth centers to infrastructure-service are further divided by vertical line of suitability score 50. Only Dhaka has infrastructure-service suitability above 80 (3rd vertical line).

Matrix: 03 (a) Urban Readiness Matrix and 484 Growth Center of Bangladesh (5 Score Interval)



Size of the circle represent urban population of growth center

I: Infrastructure-Service Suitability
E: Ecological Suitability
R: Readiness Score

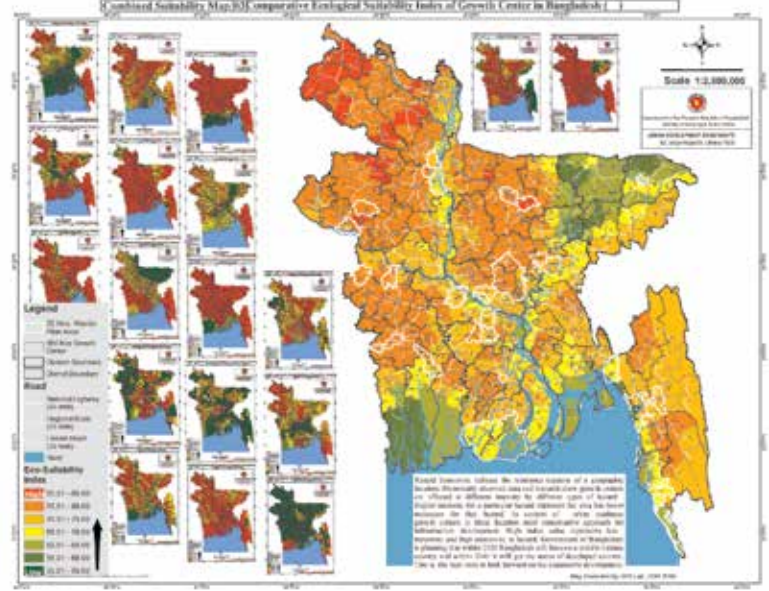
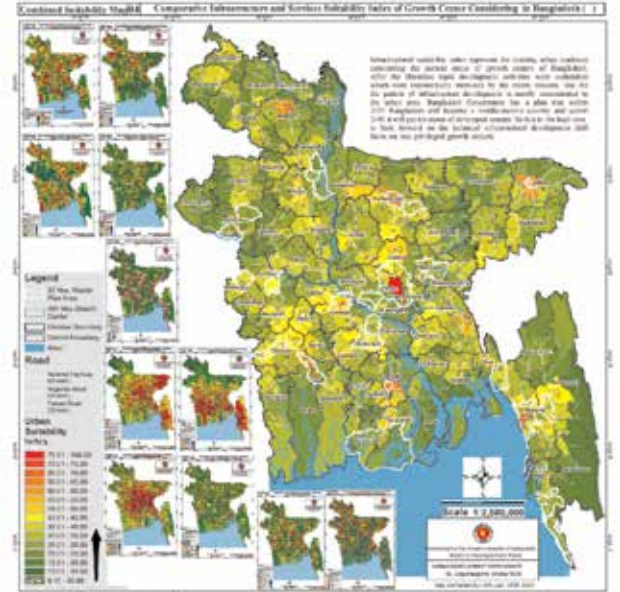
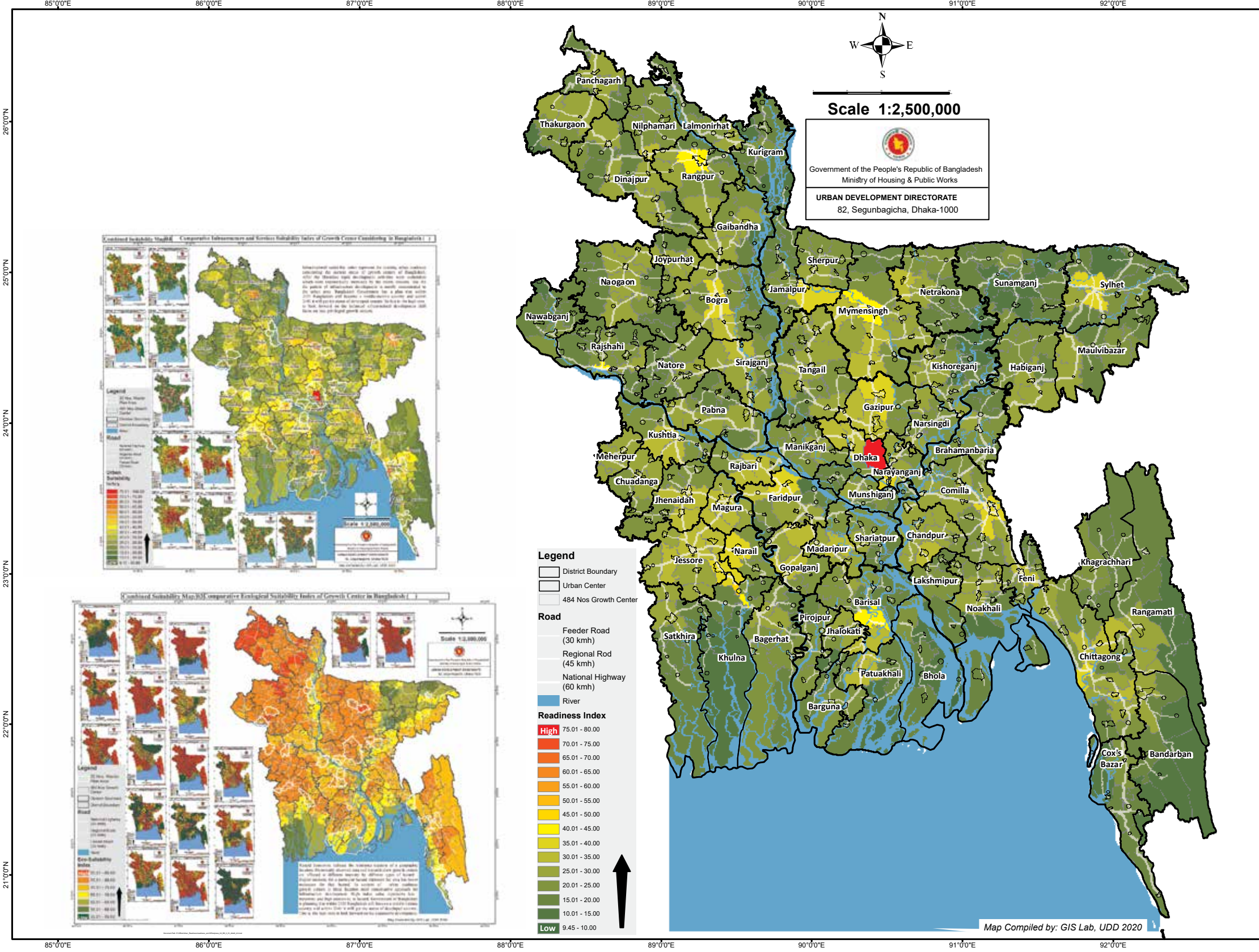
City Corporation Name
District HQ Name
Paurashava Name
Upazila Name

Legend

- Administration Type: Capital, City Corporation HQ, District HQ, Paurashava HQ, Upazila HQ, Readiness_Score_Line
- Ecological Suitability: 00, 10, 15.32, 17.41, 20.00
- Infrastructure Suitability: 00, 30.75, 60, 100
- Division: 01 Barisal, 02 Chattogram, 03 Dhaka, 04 Khulna, 05 Rajshahi, 06 Rangpur, 07 Sylhet, 08 Mymensingh
- Readiness Score: 30.01-35, 35.01-40, 40.01-45, 45.01-50, 50.01-55, 55.01-60, 60.01-65, 65.01-70, 70.01-75, 75.01-80, 80.01-85, 85.01-90, 90.01-95, 95.01-100

All 484 Growth centers of Bangladesh are graphically plotted as matrix form. Color shade on the background represents different readiness score in 5 point intervals. Urban readiness plotted as iso-curve suggests growth centers on same readiness curve has same readiness score. The convex relationship represents that, between two growth center on a same readiness iso-curve, Growth center with lower ecological suitability requires higher infrastructure-service suitability to derive same readiness. This graph represents the infrastructural suitability at horizontal (X) axis and geological sensitivity at vertical (Y) axis for each urban center. Horizontal position toward right end indicates suitable infrastructure and vertically up-ward position represents less sensitivity to geological or ecological hazard for growth centers. Circle size of each center represents the urban population size. Color of the circle represents the corresponding Division and symbol at the center represents the administrative level of the urban center according to the legend. Background color distinguishes the growth center in to 20 classes with class intervals of 5.

Readiness Map | 02 | Urban Readiness Index of Growth Center in Bangladesh



Legend

- District Boundary
- Urban Center
- 484 Nos Growth Center

Road

- Feeder Road (30 kmh)
- Regional Rod (45 kmh)
- National Highway (60 kmh)
- River

Readiness Index

- High 75.01 - 80.00
- 70.01 - 75.00
- 65.01 - 70.00
- 60.01 - 65.00
- 55.01 - 60.00
- 50.01 - 55.00
- 45.01 - 50.00
- 40.01 - 45.00
- 35.01 - 40.00
- 30.01 - 35.00
- 25.01 - 30.00
- 20.01 - 25.00
- 15.01 - 20.00
- 10.01 - 15.00
- Low 9.45 - 10.00

Map Compiled by: GIS Lab, UDD 2020

Matrix: 03 (b) Urban Readiness Matrix and 484 Growth Center of Bangladesh (5 Classes)



I: Infrastructure-Service Suitability
E: Ecological Suitability
R: Readiness Score

City Corporation Name
District HQ Name
Paurashava Name
Upazila Name

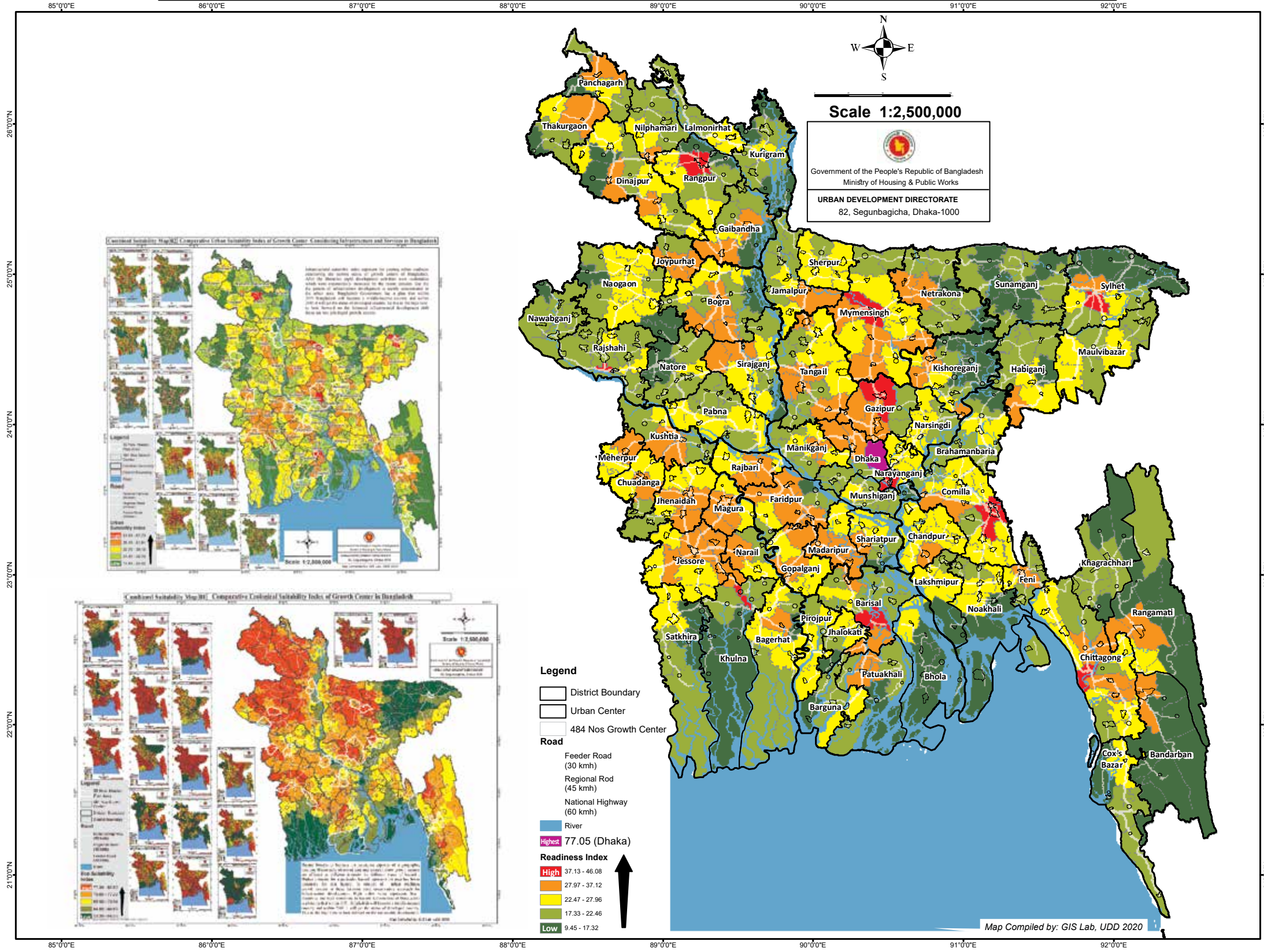
Legend

▲ Capital	● Ecological Suitability 60	● Infrastructure Suitability 60	○ Division 10 Barisal	○ 50 Rajshahi	● 50.00 & Above
◆ City Corporation HQ	● Ecological Suitability 65	● Infrastructure Suitability 65	○ Division 20 Chittagong	○ 60 Rangpur	● 47.15-50.00
◆ District HQ	● Ecological Suitability 70	● Infrastructure Suitability 70	○ Division 30 Dhaka	○ 70 Sylhet	● 44.27-47.12
◆ Paurashava HQ	● Ecological Suitability 75	● Infrastructure Suitability 75	○ Division 40 Khulna	○ 80 Mymensingh	● 41.47-44.22
○ Upazila HQ	● Ecological Suitability 80	● Infrastructure Suitability 80			● 38.69-41.42
--- Readiness Iso-Quant Line	● Ecological Suitability 85	● Infrastructure Suitability 85			● 35.91-38.66

All 484 Growth centers of Bangladesh are graphically plotted as matrix form. Colors shade in the background represent 5 different readiness class excluding Dhaka. Urban readiness plotted as iso-quant suggests growth centers on same readiness curve has same readiness score. The convex relationship represents that between two growth center on a same readiness iso-curve. Growth center with lower ecological suitability requires higher infrastructure-service suitability to derive same readiness. This graph represents the infrastructural suitability at horizontal (X) axis and geological suitability at vertical (Y) axis for each urban center. Horizontal position toward right end indicates suitable infrastructure and virtually up-ward position expresses less sensitivity to geological or ecological hazard for growth centers. Circle size of each center represents the urban population size. Color of the circle represents the corresponding Division and symbol at the center represents the administrative level of the urban center according to the legend. Background color distinguishes the growth center in to 5 classes based on neighborhood classification. Dhaka is the only growth center with readiness score above 50.

Urban Readiness in Classified View

Readiness Map 01 Urban Readiness Index of Growth Center in Bangladesh Considering Ecology, Infrastructure and Services



Urban Readiness

Readiness Chart No 01 (a): Growth Center Urban Readiness Statistics								
Urban Readiness Index Score	Administrative Level	Growth Center (Nos)	Total Population 2011	(%)	Urban Population 2011	(%)	Area (SqKM)	(%)
37.13 - 46.08	CAP	1	8747042	6.10	8747042	25.86	305.84	0.21
	City Corporation HQ	13	10032813	7.00	6937252	20.51	2352.74	1.62
	Paurashava_HQ	1	492792	0.34	126249	0.37	466.95	0.32
27.97 - 37.12	City Corporation HQ	1	1820374	1.27	689411	2.04	458.12	0.31
	District_HQ	27	10429031	7.28	2828572	8.36	9410.90	6.47
	Paurashava_HQ	40	13608348	9.49	2064612	6.10	11073.15	7.61
22.47 - 27.96	Upazilla_HQ	11	2062148	1.44	217911	0.64	2164.97	1.49
	District_HQ	19	8076863	5.64	2052190	6.07	6112.30	4.20
	Paurashava_HQ	91	26880529	18.76	3633851	10.74	25662.58	17.63
17.33 - 22.46	Upazilla_HQ	32	6764839	4.72	447113	1.32	6501.31	4.47
	District_HQ	7	2467554	1.72	805722	2.38	2166.23	1.49
	Paurashava_HQ	86	21773763	15.19	2881350	8.52	26680.31	18.33
9.45 - 17.32	Upazilla_HQ	75	16277490	11.36	1016288	3.01	20865.86	14.34
	Paurashava_HQ	20	5034022	3.51	632774	1.87	10036.21	6.90
Total		484	143321734	100.00	33819224	100.00	145547.31	100.00

Data Compiled by GIS Lab UDD, 2020

Readiness Chart No 01 (a): Growth Center Urban Readiness Statistics			
Urban Readiness Index Score	Administrative Level	Growth Center (Nos)	Name of Growth Center
Score : 37.13 - 46.08	CAP	1	Dhaka City (DNCC & DSCC)
	City Corporation HQ	13	Bandar (NCC) & Tarabo, Barisal Sadar (BCC), Chattogram City (CCC), Cumilla Sadar (Cumilla CC), Khan Jahan Ali (KCC), Khulna Sadar (KCC), Mymensingh Sadar (MCC), Narayanganj Sadar (NCC) & Shiddhirganj, Rajshahi Sadar (RCC), Rangpur Sadar (Rangpur CC), South Cumilla (Cumilla CC), South Surma (Sylhet CC), Sylhet Sadar (Sylhet CC)
	Paurashava_HQ	1	Sreepur Gazipur
Score : 27.97 - 37.12	City Corporation HQ	1	Gazipur Sadar (GCC & Tongi)
	District_HQ	27	Bagerhat Sadar, Bandarban Sadar, Bogura Sadar, Chuadanga Sadar, Dinajpur Sadar, Faridpur Sadar, Feni Sadar, Gaibandha Sadar, Gopalganj Sadar, Jamalpur Sadar, Jashore Sadar, Jhenaidaha Sadar, Joypurhat Sadar, Kishoreganj Sadar, Kushtia Sadar, Madaripur Sadar, Magura Sadar, Manikganj Sadar, Narail Sadar, Netrokona Sadar, Panchagarh Sadar, Patuakhali Sadar, Rajbari Sadar, Rangamati Sadar, Shariatpur Sadar, Tangail Sadar, Thakurgaon Sadar
	Paurashava_HQ	40	Abhaynagar, Bagherpara, Bakerganj, Bhairab, Bhaluka, Bhanga, Chandanaish, Chandina, Daudkandi, Dhamrai, Dhanbari, Faridganj, Fulbari, Gangni, Gaurnadi, Gobindaganj, Jhikargachha, Kalai, Kaliakair, Kaliganj Jhenaidah, Kalihati, Kalkini, Madhabpur, Mirpur Kushtia, Mirzapur, Muksudpur, Muktagachha, Nagarkanda, Nandail, nandigram, Pakundia, Patiya, Purbadhala, Raozan, Royganj, Saidpur, Savar, Shalikh, sherpur, Trishal
	Upazilla_HQ	11	Ashuganj, Batia Kandi, Dumki, Hathazari, Kawkhali Rangamati, Khetlal, Madhukhali, Phuttala, Rajoir, Shajahanpur (Majhira) Bogra, Tarash

Readiness Chart No 01 (a): Growth Center Urban Readiness Statistics			
Urban Readiness Index Score	Administrative Level	Growth Center (Nos)	Name of Growth Center
Score : 22.47 - 27.96	District_HQ	19	Bhola Sadar, Brahmanbaria Sadar, Chandpur Sadar, Habiganj Sadar & Shayestaganj, Jhalokati Sadar, Kurigram Sadar, Lakshmipur Sadar, Lalmonirhat Sadar, Maulvi Bazar Sadar, Meherpur Sadar, Naogaon Sadar, Narsingdi Sadar & Madhabdi, Nilphamari Sadar, Noakhali Sadar, Pabna Sadar, Pirojpur Sadar, Satkhira Sadar, Sherpur Sadar, Sirajganj Sadar
	Paurashava_HQ	91	Akkelpur, Alamdanga, Amtali, Badarganj, Begumganj (Chowmuhani), Benapole (Sharsha), Bera, Bheramara, Birampur, Birganj, Boalmari, Bochaganj (Setabganj), Boda, Chakaria, Chaudhagram, Chaugachha, Chunarughat, Daganbhuiyan, Darshana (Damurhuda), Debidwar, Dhamoirhat, dhupchanchia, Fulbaria, Gaffargaon, Gauripur, Ghatail, Ghoraghat, Ghorashal (Palash), Goalandaghat, Golabganj, Gurudaspur, Harinakunda, Haziganj, Hossainpur, Ishwardi, Ishwarganj, Kachua Chandpur, Kalaroa, Kalia, Katiadi, Keshabpur, Kesharhat (Mohampur), Kotalipara, Kotchandpur, Kulaura, Kuliar Char, Laksam, Madhupur, Mahadebpur, Manirampur, Manohardi, Mathbaria, Matlab Dakshin, Matlab Uttar (Sengarchar), Melandaha, Mirsharai (Barairhat), Morrelganj Bagerhat, Nakla, Nalchity, Nalitabari, Nangalkot, Naria, Nazipur (Patnitala), Nesarabad (Swarupkati), Pangsha, Parbatipur, Phulpur, Puthia, Raipur, Rangunia, Rugganj & Kanchan, Sakhipur, Santhia, Sarishabari, Satkania, Senbagh, Shahjadpur, Shahrasti, Shaikupa, Shib Char, Shibganj Bogra, Shibpur, Singair, Sitakunda, Sonargaon, Sonatola, Sreebardi, Sreemangal, Tungipara, Ullah Para, Zanjira
	Upazilla_HQ	32	Aditmari, Anowara, Araihasar, Baliadangi, Bhandaria, Bishwanath, Brahman Para, Burichang, Fakirhat, Fenchuganj, Ghior, Haimchar, Kaptai, Kashiani, Lohagara Chittagong, Manda, Mohammadpur, Mollahat, Monoharganj, Morrelganj (Zianagar) Pirojpur, Mujibnagar, Muradnagar, Palashbari, Pirganj Rangpur, Rajasthali, Rampal, Sauria, Sreenagar, Sreepur Magura, Taraganj, Titash, Wazirpur
Score : 17.33 - 22.46	District_HQ	7	Barguna Sadar, Cox's Bazar Sadar, Khagrachhari Sadar, Munshiganj Sadar & Mirkadim, Natore Sadar & Naldanga, Nawabganj Sadar, Sunamganj Sadar
	Paurashava_HQ	86	Adamdighi, Ajmiriganj, Akhaura, Atgharia, Bagha & Arani, Baghai Chhari, Bajitpur, Banaripara, Banskhal, Baraigram & Banpara, Barlekha, Barura, Bauphal, Beanibazar, Belkuchi, Betagi, Bhabaniganj (Baghmara) & Tahirpur, Bhangura, Bhedarganj, Bhuapur, Charchat, Chatkhil, Chatmohar, Chhagalniya, Chhatak, Damudya, Dewanganj, dhunat, Dohar, Domar, Durgapur Netrakona, Durgapur Rajshahi, Faridpur, gabtali, Godagari & Kakanhat, Gopalpur, Gopalpur (Lalpur), Hakimpur, Homna, Islampur, Jagannathpur, Jaldhaka, Jibannagar, kahaloo, Kalapara & Kuakata, Kaliganj Gazipur, Kamalganj, Karimganj, Kasba, Kazipur, Kendua, Khoksa, Kumarkhali, Lohagara Narail, Madan, Madarganj, Maheshpur, Matiranga, Mehendiganj, Mohanganj, Mongla, Muladi, Nabiganj, Nabinagar, Nachole, Nageshwari, Panchbibi, Parshuram, Patgram, Pirganj Thakurgaon, Poba & Katakhal & Noahata, Rahanpur (Gomastapur), Ramganj, Ramgarh, Ranisankail, Raypura, Sandwip, Shibganj Nawabganj, Singra, Sonagazi, Sonaimuri, Sujanagar, Sundarganj, Tanore & mundumala, Teknaf, Ulipur
	Upazilla_HQ	75	Agailjhara, Alfadanga, Atpara, Babuganj, Badalgachhi, Bakshiganj, Balaganj, Bamna, Banchharampur, Baniachong, Basail, Belabo, Bishwambarpur, Boalkhali, Chirirbandar, Chitalmari, Dashmina, Daulatpur Kushtia, Daulatpur Manikganj, Debhata, Debiganj, Delduar, Dharampasha, Dhobaura, Dighalia, Dimla, Dumuria, Fatikchhari, Fulgazi, Haluaghat, Harirampur, Hatibandha, Hizla, Jhenaigati, Juri, Kaliganj Lalmonirhat, Kaliganj Satkhira, Kalmakanda, Kamarkhanda, Kapasia, Kawkhali Pirojpur, Keraniganj, Khansama, Kishoreganj, Lakhai, Lohajang, Mahalchhari, Manikchhari, Meghna, Mirzaganj, Mitha Pukur, Nagarpur, Nawabganj Dhaka, Nawabganj Dinajpur, Nazirpur, Niamatpur, Pirgachha, Rajapur, Rajarhat, Rajnagar, Ramu, Rupsa, Sadarpur, Sadullapur, Sapahar, Sarail, Sarankhola, Serajdikhan, Shibalaya, Shyamnagar, Sulla, Tentulia, Terokhada, Tongibari, Ukhia
Score : 9.45 - 17.32	Paurashava_HQ	20	Bagati Para, Burhanuddin, Chalna (Dacope), Char Fasson, Companiganj (Bashurhat) Noakhali, Daulat Khan, Derai, Galachipa, Haragacha (Kaunia), Hatiya, Kabirhat, Kanaighat, Lalmoan, Lama, Maheshkhali, Paikgachha, Patharghata, Ramgati, sariakandi, Zakiganj
	Upazilla_HQ	60	Alikadam, Assasuni, Atrai, Atwari, Austagram, Bahubal, Barhatta, Barkal, Batiaghata, Belai Chhari, Bholahat, Bhurungamari, Biral, Char Bhadrason, Char Rajibpur, Chauhali, Chilhari, Companiganj Sylhet, Dighinala, Dowarabazar, Fulchhari, Gangachara, Gazaria, Gosairhat, Gowainghat, Haripur, Itna, Jaintiapur, Jamalganj, Jurai Chhari, Kachua Bagerhat, Kaharole, Kanthalia, Khaliajuri, Koyra, Kutubdia, Lakshmichhari, Langadu, Manpura, Mithamain, Naikhongchhari, Naniarchar, Nasirnagar, Nikli, Panchhari, Pekua, Phulbari, Porsha, Raninagar, Raumari, Rowangchhari, Ruma, Saghatta, South Sunamganj, Subarnachar, Tahirpur, Tala, Tarail, Tazumuddin, Thanchi

Data Compiled by GIS Lab UDD, 2020

Urban Readiness

District wise Index Score of Each Growth Center Urban Readiness in Alphabetical Order

District	Growth Center	U.Readiness
Narail	Kalia	24.40
	Lohagara Narail	21.33
	Narail Sadar	36.11
Narayanganj	Araihazar	24.68
	Bandar (NCC) & Tarabo	38.44
	Narayanganj Sadar (NCC) & Shiddhirganj	39.29
	Rupganj & Kanchan	25.62
	Sonargaon	26.83
	Belabo	22.13
Narsingdi	Ghorashal (Palash)	24.87
	Manohardi	27.06
	Narsingdi Sadar & Madhabdi	25.93
	Raypura	22.15
	Shibpur	24.99
	Bagati Para	16.30
Natore	Baraigram & Banpara	21.44
	Gopalpur (Lalpur)	18.29
	Gurudaspur	27.86
	Natore Sadar & Naldanga	17.32
Singra	Singra	22.31
	Bholahat	11.92
	Nachole	18.61
Nawabganj	Nawabganj Sadar	21.69
	Rahanpur (Gomastapur)	19.54
	Shibganj Nawabganj	18.83
	Atpara	18.93
Netrakona	Barhatta	17.23
	Durgapur Netrakona	20.56
	Kalmakanda	20.95
	Kendua	18.77
	Khaliajuri	11.73
	Madan	17.81
	Mohanganj	19.51
	Netrokona Sadar	28.17
	Purbadhala	30.41
	Dimla	20.19
Nilphamari	Domar	20.13
	Jaldhaka	21.05
	Kishoreganj	21.00
	Nilphamari Sadar	22.62
	Saidpur	31.81

District	Growth Center	U.Readiness
Noakhali	Begumganj (Chowmuhani)	25.30
	Chatkhil	20.78
	Companiganj (Bashurhat) Noakhali	16.46
	Hatiya	16.27
	Kabirhat	16.70
	Noakhali Sadar	25.03
	Senbagh	25.77
	Sonaimuri	22.34
	Subarnachar	11.38
	Atgharia	22.44
Pabna	Bera	24.55
	Bhangura	22.43
	Chatmohar	18.29
	Faridpur	19.80
	Ishwardi	25.01
	Pabna Sadar	26.71
	Santhia	25.12
	Sujanagar	18.79
	Atwari	17.09
	Boda	26.96
Panchagarh	Debiganj	18.65
	Panchagarh Sadar	29.21
	Tentulia	19.43
	Bauphal	18.23
Patuakhali	Dashmina	18.35
	Dumki	32.54
	Galachipa	14.51
	Kalapara & Kuakata	18.14
	Mirzaganj	18.08
	Patuakhali Sadar	33.02
	Bhandaria	23.93
	Kawkhali Pirojpur	20.08
Pirojpur	Mathbaria	22.73
	Morrelganj (Zianagar) Pirojpur	24.57
	Nazirpur	18.54
	Nesarabad (Swarupkati)	24.09
	Pirojpur Sadar	24.70
	Balia Kandi	33.64
	Goalandaghat	26.29
	Pangsha	24.44
Rajbari	Rajbari Sadar	32.96

District	Growth Center	U.Readiness
Rajshahi	Bagha & Arani	18.72
	Bhabanigonj (Baghmara) & Tahirpur	19.94
	Charghat	19.02
	Durgapur Rajshahi	21.36
	Godagari & Kakanhat	17.76
	Kesharhat (Mohanpur)	23.67
	Poba & Katakhal & Noahata	22.33
	Puthia	25.34
	Rajshahi Sadar (RCC)	44.22
	Tanore & mundumala	17.88
Rangamati	Baghai Chhari	18.48
	Barkal	13.64
	Belai Chhari	14.08
	Jurai Chhari	13.77
	Kaptai	25.38
	Kawkhali Rangamati	30.09
	Langadu	15.80
	Naniarchar	16.13
	Rajasthali	26.32
	Rangamati Sadar	28.64
Rangpur	Badarganj	26.51
	Gangachara	16.25
	Haragacha (Kaunia)	16.19
	Mitha Pukur	21.11
	Pirgachha	21.13
	Pirganj Rangpur	26.04
	Rangpur Sadar (Rangpur CC)	44.47
	Taraganj	25.12
	Assasuni	16.76
	Debhata	18.29
Satkhira	Kalaroa	27.03
	Kaliganj Satkhira	19.97
	Satkhira Sadar	27.55
	Shyamnagar	18.59
	Tala	15.66
	Bhedarganj	18.98
	Damudya	19.93
	Gosairhat	16.50
	Naria	22.85
	Shariatpur Sadar	28.37
Shariatpur	Zanjira	22.53
	Jhenaigati	20.83
	Nakla	24.82
	Nalitabari	24.14
	Sherpur Sadar	26.18
Sherpur	Sreebardi	23.45

District wise Index Score of Each Growth Center Urban Readiness in Alphabetical Order

District	Growth Center	U.Readiness
Sirajganj	Belkuchi	17.91
	Chauhali	13.77
	Kamarkhanda	20.16
	Kazipur	19.42
	Royganj	33.18
	Shahjadpur	26.70
	Sirajganj Sadar	23.55
	Tarash	29.13
	Ullah Para	25.84
	Bishwambarpur	20.37
Sunamganj	Chhatak	19.83
	Derai	14.53
	Dharampasha	17.92
	Dowarabazar	12.95
	Jagannathpur	19.56
	Jamalganj	13.09
	South Sunamganj	13.57
	Sulla	20.66
	Sunamganj Sadar	18.63
	Tahirpur	15.24

District	Growth Center	U.Readiness
Sylhet	Balaganj	18.97
	Beanibazar	20.77
	Bishwanath	25.56
	Companiganj Sylhet	15.80
	Fenchuganj	22.80
	Golabganj	23.59
	Gowainghat	13.66
	Jaintiapur	17.26
	Kanaighat	15.46
	South Surma (Sylhet CC)	38.78
Sylhet Sadar (Sylhet CC)	Sylhet Sadar (Sylhet CC)	37.12
	Zakiganj	17.30

District	Growth Center	U.Readiness
Tangail	Basail	20.16
	Bhuapur	20.91
	Delduar	19.97
	Dhanbari	29.17
	Ghatail	25.41
	Gopalpur	21.44
	Kalihati	28.68
	Madhupur	26.62
	Mirzapur	28.56
	Nagarpur	19.71
Thakurgaon	Sakhipur	23.76
	Tangail Sadar	29.74
	Baliadangi	26.40
	Haripur	14.03
	Pirganj Thakurgaon	20.05
Ranisankail	20.37	
Thakurgaon Sadar	29.24	

Data Compiled by GIS Lab UDD, 2020

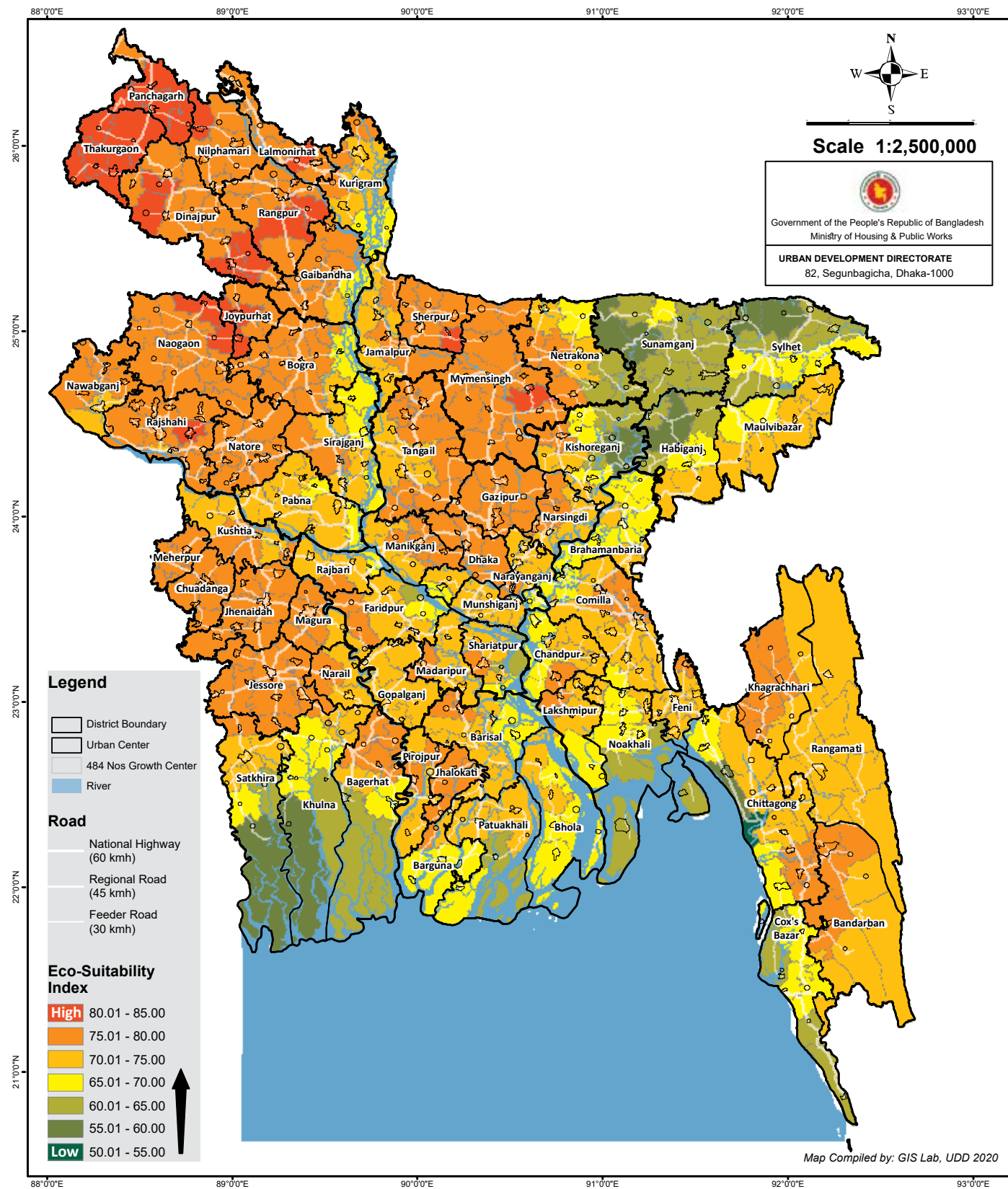
Urban Readiness

Infrastructural suitability represents the growth centers maturity considering the current infrastructure and services available. Ecological sensitivity represents the historical likelihood ecological phenomenon including hazard incidence in growth centers. Urban readiness of each growth center is multiplication of infrastructure-service suitability and per unit hazard sensitivity. Outcome value represents the pay back of investment. In attempt to facilitate risk sensitive infrastructural development plan and policies and to focus on less privileged growth centers urban readiness will health practitioners.

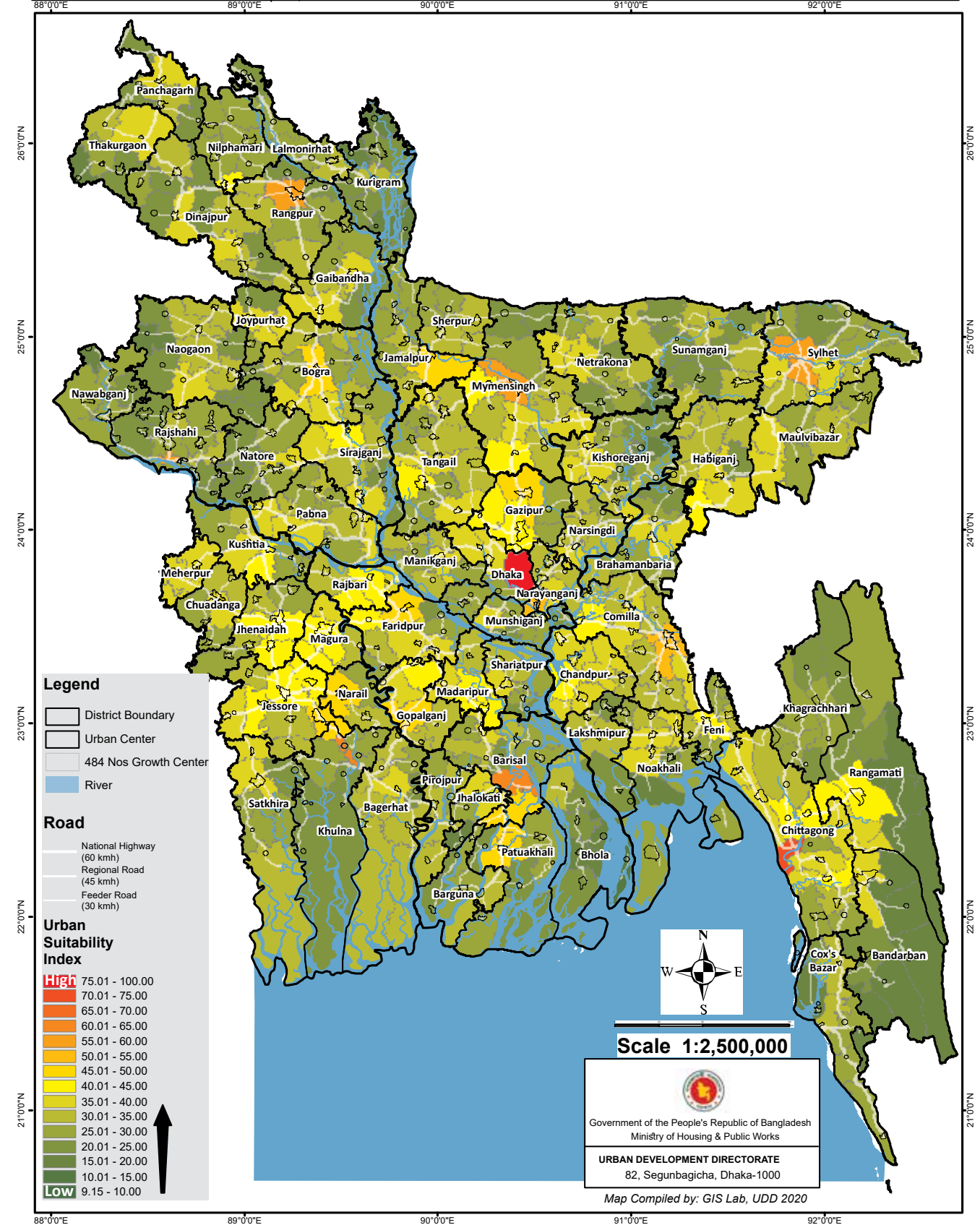
Two Suitabilities in Actual View

Urban Readiness

Combined Suitability Map|03| Comparative Ecological Suitability Index of Growth Center in Bangladesh



Combined Suitability Map|04| Comparative Infrastructure and Services Suitability Index of Growth Center in Bangladesh

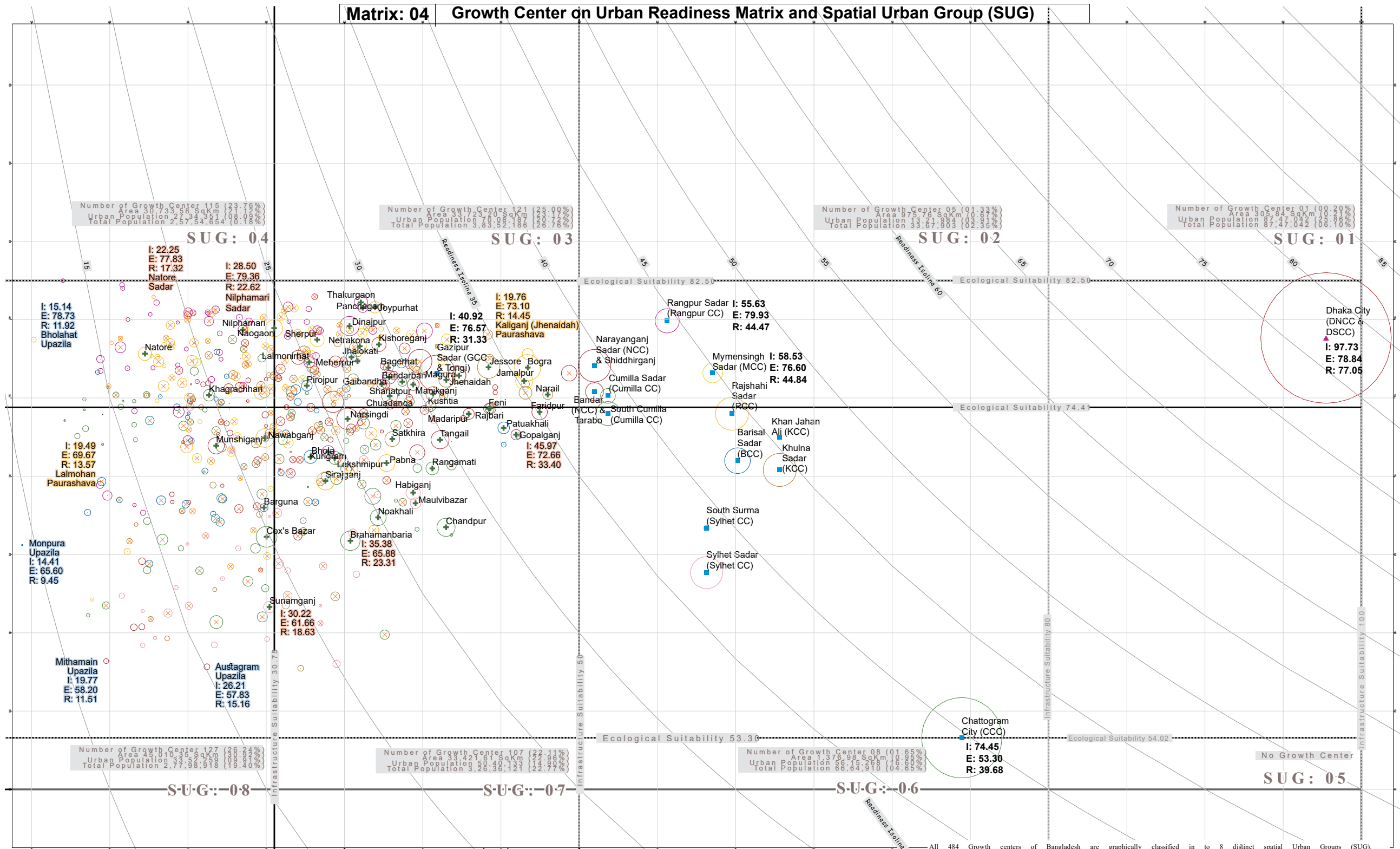


Spatial Urban Group (SUG)

According to BBS 2011, total urban population of Bangladesh is 3,46,42,449. This population is not uniformly distributed among 484 growth centers of the country. Different growth center has different ecological factors, geological character with different level of risk from numerous hazards. Development patterns especially arrangement of infrastructure-service of different urban centers are not similar. This graph of readiness matrix represents the infrastructure-service suitability at horizontal (X) axis and ecological suitability at vertical (Y) axis for each urban center. Horizontal position towards right end indicates suitable infrastructure-service and vertical up-ward position represents less sensitivity to ecological phenomenon or growth centers. Circle size of each center represents the urban population size. Color of the circle represents corresponding division and symbol at the center represents the outmost administrative level of the urban center. Horizontal middle line separates growth centers in to two groups. One group with ecological suitability score above 50 and the other with score below 50, while considering the infrastructure-service suitability, vertical middle line splits the growth center with score above 50 (right side of the middle line) and growth center with score below 50 (Left side of the middle line). This x-y plot reveals that there is no growth center where eco-suitability score is less than 50. Arrangement of all 484 growth centers of Bangladesh are graphically classified in to 8 (eight) distinct Spatial Urban Groups (SUG). Horizontal line by ecological suitability score of 74.41 separates 484 growth centers with ecologically less suitable 50% and ecologically more suitable 50% growth centers. The vertical line by suitability score of 30.75 separates 50% growth centers with less suitable to infrastructure-service from other 50% more suitable growth centers. Higher suitable growth centers to infrastructure-service are further divided by vertical line of suitability score 80. Only Dhaka has infrastructure-service suitability above 80 (3rd vertical line). These 4 (four) lines graphically classify all 484 growth centers of Bangladesh in to 8 (eight) distinct Spatial Urban Groups (SUG). Graph of readiness

matrix also plotted urban readiness as iso-quant curve or readiness iso-quant line. Growth centers on same readiness curve have same readiness score. The convex relationship represents that, between two growth centers on a same readiness iso-quant curve; growth center with lower ecological suitability, has higher infrastructure-service suitability and same urban readiness. Slops at each point of a readiness curve represents marginal rate of substitution between ecological suitability and infrastructure-service suitability.

This study suggests that growth centers in these different SUG needs different urban policy guidelines to achieve higher urban readiness. Urban policy makers and urban planners have to agree on a viable urban readiness status to be achieved by each growth center in each SUG. So separate policy guideline is needed for each SUG. Different intervention is necessary for growth centers in different SUG, to achieve higher readiness status overcoming its ecological constraint with proper reinforcement of existing infrastructure-service. Capital Dhaka is only growth center in SUG-01. There is no growth center in SUG-05. With a proper national urban policy, it is possible to push up more growth centers in SUG-02 and SUG-06.



Size of the circle represent urban population of growth center

I: Infrastructure-Service Suitability
E: Ecological Suitability
R: Readiness Score

City Corporation Name
District HQ Name
Paurashava Name
Upazila Name

Legend

Administration Type
Capital
City Corporation HQ
District_HQ
Paurashava_HQ
Upazila_HQ
Readiness_Iso_Quant_Line

Ecological Suitability 00
Ecological Suitability 50
Ecological Suitability 53.30
Ecological Suitability 74.41
Ecological Suitability 82.50

Infrastructure-Service Suitability 00
Infrastructure-Service Suitability 30.75
Infrastructure-Service Suitability 50
Infrastructure-Service Suitability 75
Infrastructure-Service Suitability 100

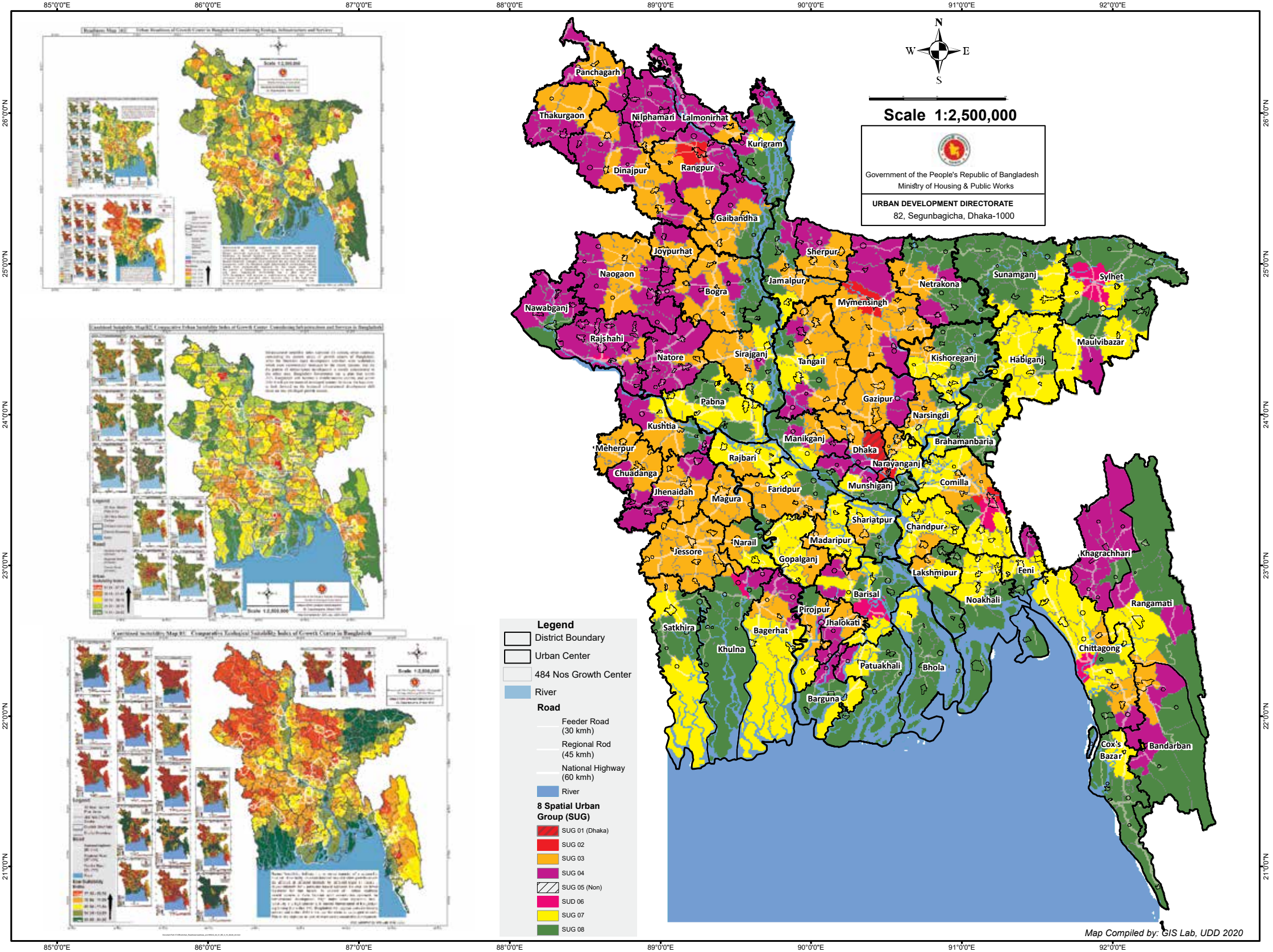
Division

- 10 Barishal
- 20 Chattogram
- 30 Dhaka
- 40 Khulna
- 50 Rajshahi
- 60 Rangpur
- 70 Sylhet
- 80 Mymensingh

All 484 Growth centers of Bangladesh are graphically classified in to 8 distinct spatial Urban Groups (SUG). Urban readiness plotted as iso-curve suggests growth centers on same readiness curve has same readiness score. The convex relationship represents that, between two growth center on a same readiness iso-curve, growth center with lower ecological suitability requires higher infrastructure-service suitability to derive same readiness. This graph represents the Infrastructural suitability at horizontal (X) axis and geological sensitivity at vertical (Y) axis for each urban center. Horizontal position toward right end indicates suitable infrastructure and virtually up-ward position represents less sensitivity to geological or ecological hazard for growth centers. Circle size of each center represents the urban population size. Color of the circle represents the corresponding Division and symbol at the center represents the administrative level of the urban center according to the legend. Horizontal middle line by ecological suitability score of 71.25 splits the 484 growth centers with 242 ecologically less suitable and 242 ecologically more suitable growth centers. Vertical middle line by suitability score 33.75 splits the 484 growth centers with 242 less suitable to infrastructure-service and 242 more suitable growth centers. Higher suitable 242 growth centers to infrastructure-service are further divided by vertical line of suitability score 50. Only Dhaka has infrastructure-service suitability above 80 (3rd vertical line).

Spatial Urban Groups (SUG)

SUG Map 01 | 8 SUG of Growth Center in Bangladesh and there Geographical Distribution



SUG and summary table of growth center under different spatial urban group (SUG)

SUG Chart No 01(a): Growth center statistics under different spatial urban group (SUG)								
Spatial Urban Group	Administrative Level	Growth Center (Nos)	Total Population 2011	(%)	Urban Population 2011	(%)	Area (SqKM)	(%)
SUG 01	CAP	1	8747042	6.10	8747042	25.86	305.84	0.21
SUG 02	City Corporation HQ	5	3367903	2.35	1321984	3.91	975.76	0.67
SUG 03	City Corporation HQ	1	1820374	1.27	689411	2.04	458.12	0.31
	District_HQ	24	8872584	6.19	2435958	7.20	7807.94	5.36
	Paurashava_HQ	75	23386668	16.32	3510006	10.38	21152.61	14.53
SUG 04	Upazilla_HQ	21	4272560	2.98	372812	1.10	4304.54	2.96
	District_HQ	4	1394565	0.97	356838	1.06	1342.33	0.92
	Paurashava_HQ	49	12096904	8.44	1654954	4.89	13953.23	9.59
SUG 04	Upazilla_HQ	62	12263185	8.56	722559	2.14	15438.02	10.61
	Null	-	-	-	-	-	-	-
SUG 05	City Corporation HQ	8	6664910	4.65	5615268	16.60	1376.98	0.95
SUG 07	District_HQ	20	8793000	6.14	2248869	6.65	7060.01	4.85
	Paurashava_HQ	59	17812989	12.43	2392542	7.07	17523.43	12.04
	Upazilla_HQ	28	6030132	4.21	398722	1.18	8838.17	6.07
SUG 08	District_HQ	5	1913299	1.33	644819	1.91	1479.15	1.02
	Paurashava_HQ	55	14492893	10.11	1781334	5.27	21289.94	14.63
	Upazilla_HQ	67	11392726	7.95	926106	2.74	22241.26	15.28
Total		484	143321734	100.00	33819224	100.00	145547.31	100.00

Data Compiled by GIS Lab UDD, 2020

SUG Chart No 01(b): Name of growth center under different spatial urban group (SUG)			
Spatial Urban Group	Administrative Level	Growth Center (Nos)	Name of growth center
SUG 01	CAP	1	Dhaka City (DNCC & DSCC)
SUG 02	City Corporation HQ	5	Bandar (NCC) & Tarabo, Cumilla Sadar (Cumilla CC), Mymensingh Sadar (MCC), Narayanganj Sadar (NCC) & Shiddhirganj, Rangpur Sadar (Rangpur CC)
SUG 03	City Corporation HQ	1	Gazipur Sadar (GCC & Tongi)
	District_HQ	24	Bagerhat Sadar, Bandarban Sadar, Bogura Sadar, Chuadanga Sadar, Dinajpur Sadar, Gaibandha Sadar, Jamalpur Sadar, Jashore Sadar, Jhalokati Sadar, Jhenaidaha Sadar, Joypurhat Sadar, Kishoreganj Sadar, Kushtia Sadar, Lalmonirhat Sadar, Magura Sadar, Manikganj Sadar, Meherpur Sadar, Narail Sadar, Netrokona Sadar, Panchagarh Sadar, Pirojpur Sadar, Shariatpur Sadar, Sherpur Sadar, Thakurgaon Sadar
	Paurashava_HQ	75	Abhaynagar, Alamdanga, Badarganj, Bagherpara, Benapole (Sharsha), Bhaluka, Bhanga, Birampur, Birganj, Boalmari, Boda, Chandanaish, Chandina, Chaugachha, Debidwar, Dhamoirhat, Dhamrai, Dhanbari, dhupchanchia, Faridganj, Fulbari, Fulbaria, Gangni, Gauripur, Gaurnadi, Ghatail, Ghoraghat, Ghorashal (Palash), Gobindaganj, Gurudaspur, Harinakunda, Hossainpur, Ishwarganj, Jhikargachha, Kalai, Kalaroa, Kaliakair, Kaliganj Jhenaidah, Keshabpur, Kotalipara, Madhupur, Mahadebpur, Manirampur, Manohardi, Melandaha, Mirpur Kushtia, Mirzapur, Muktagachha, Nagarkanda, Nakla, Nalchity, Nalitabari, Nandail, nandigram, Nazipur (Patnitala), Nesarabad (Swarupkati), Parbatipur, Purbadhala, Puthia, Raipur, Raozan, Royganj, Rupganj & Kanchan, Saidpur, Sakhipur, Satkania, Savar, Shalikhia, sherpur, Shibganj Bogra, Shibpur, Sonatola, Sreepur Gazipur, Trishal, Ullah Para
	Upazilla_HQ	21	Balia Kandi, Baliadangi, Bhandaria, Brahman Para, Burichang, Fakirhat, Khetlal, Madhukhali, Manda, Mohammadpur, Mujibnagar, Palashbari, Phultala, Pirganj Rangpur, Rajasthali, Rajoir, Saturia, Shajahanpur (Majhira) Bogra, Sreepur Magura, Taraganj, Tarash

Data Compiled by GIS Lab UDD, 2020

SUG Chart No 01(b): Name of growth center under different spatial urban group (SUG)			
Spatial Urban Group	Administrative Level	Growth Center (Nos)	Name of growth center
SUG 04	District_HQ	4	Khagrachhari Sadar, Naogaon Sadar, Natore Sadar & Naldanga, Nilphamari Sadar
	Paurashava_HQ	49	Adamdighi, Akkelpur, Bagati Para, Bagha & Arani, Banaripara, Baraigram & Banpara, Betagi, Bhabanigonj (Baghmara) & Tahirpur, Bochaganj (Setabganj), Charghat, Darshana (Damurhuda), Domar, Durgapur Rajshahi, gabtali, Gaffargaon, Godagari & Kakanhat, Gopalpur, Gopalpur (Lalpur), Hakimpur, Haragacha (Kaunia), Jaldhaka, Jibannagar, kahaloo, Kaliganj Gazipur, Kamalganj, Kendua, Kesharhat (Mohanpur), Khoksa, Kotchandpur, Lama, Maheshpur, Matiranga, Nachole, Panchbibi, Parshuram, Patgram, Phulpur, Pirganj Thakurgaon, Poba & Katakhalai & Noahata, Rahanpur (Gomastapur), Ramgarh, Ranisankail, Shailkupa, Shibganj Nawabganj, Singair, Singra, Sreebardi, Sundarganj, Tanore & mundumala
	Upazilla_HQ	62	Aditmari, Agailjhara, Atrai, Atwari, Badalgachhi, Bakshiganj, Bamna, Barhatta, Bholahat, Bhurungamari, Biral, Chirirbandar, Chitalmari, Daulatpur Kushtia, Debiganj, Delduar, Dhobaura, Dighalia, Dighinala, Dimla, Fulgazi, Gangachara, Ghior, Haluaghat, Hariपुर, Hatibandha, Jhenaigati, Jurai Chhari, Kachua Bagerhat, Kaharole, Kaliganj Lalmonirhat, Kamarkhanda, Kanthalia, Kapasia, Kawkhalai Pirojpur, Keraniganj, Khansama, Kishoreganj, Lakshnichhari, Lohagara Chittagong, Manikchhari, Mirzaganj, Mitha Pukur, Mollahat, Nagarpur, Naniarchar, Nawabganj Dhaka, Nawabganj Dinajpur, Niamatpur, Panchhari, Phulbari, Pirgachha, Porsha, Rajapur, Rajarhat, Raninagar, Rowangchhari, Sadullapur, Sapahar, Serajdikhan, Tentulia, Terokhada
SUG 05	Null	0	Null
SUG 06	City Corporation HQ	8	Barisal Sadar (BCC), Chattogram City (CCC), Khan Jahan Ali (KCC), Khulna Sadar (KCC), Rajshahi Sadar (RCC), South Cumilla (Cumilla CC), South Surma (Sylhet CC), Sylhet Sadar (Sylhet CC)
SUG 07	District_HQ	20	Bhola Sadar, Brahmanbaria Sadar, Chandpur Sadar, Faridpur Sadar, Feni Sadar, Gopalganj Sadar, Habiganj Sadar & Shayestaganj, Kurigram Sadar, Lakshimpur Sadar, Madaripur Sadar, Maulvi Bazar Sadar, Narsingdi Sadar & Madhabdi, Noakhali Sadar, Pabna Sadar, Patuakhali Sadar, Rajbari Sadar, Rangamati Sadar, Satkhira Sadar, Sirajganj Sadar, Tangail Sadar
	Paurashava_HQ	59	Ajmiriganj, Amtali, Bajitpur, Bakerganj, Begumganj (Chowmuhan), Bera, Bhairab, Bhangura, Bheramara, Chakaria, Chaudagram, Chhagalnaiya, Chhatak, Chunarughat, Daganbhuiyan, Daudkandi, Goalandaghat, Golabganj, Haziganj, Homna, Ishwardi, Jagannathpur, Kachua Chandpur, Kalia, Kalihati, Kalkini, Katiadi, Kulaura, Kular Char, Laksam, Madhabpur, Mathbaria, Matlab Dakshin, Matlab Uttar (Sengarchar), Mirsharai (Baraiarhat), Mongla, Morrelganj Bagerhat, Muksudpur, Muladi, Nabiganj, Nangalkot, Naria, Pakundia, Pangsha, Patiya, Rangunia, Raypura, Santhia, Sarishabari, Senbagh, Shahjadpur, Shahrasti, Shib Char, Sitakunda, Sonaimuri, Sonargaon, Sreemangal, Tungipara, Zanjira
	Upazilla_HQ	28	Anowara, Araiazar, Ashuganj, Banchharampur, Baniachong, Bishwanath, Dumki, Fatikchhari, Fenchuganj, Haimchar, Harirampur, Hathazari, Juri, Kaptai, Kashiani, Kawkhalai Rangamati, Lakhai, Meghna, Monoharganj, Morrelganj (Zianagar) Pirojpur, Muradnagar, Rampal, Sarankhola, Shyamnagar, Sreenagar, Sulla, Titash, Wazirpur
SUG 08	District_HQ	5	Barguna Sadar, Cox's Bazar Sadar, Munshiganj Sadar & Mirkadim, Nawabganj Sadar, Sunamganj Sadar
	Paurashava_HQ	55	Akhaura, Atgharia, Baghai Chhari, Banshkhali, Barlekha, Barura, Bauphal, Beanibazar, Belkuchi, Bhedarganj, Bhuapur, Burhanuddin, Chalna (Dacope), Char Fasson, Chatkhil, Chatmohar, Companiganj (Bashurhat) Noakhali, Damudya, Daulat Khan, Derai, Dewanganj, dhunat, Dohar, Durgapur Netrakona, Faridpur, Galachipa, Hatiya, Islampur, Kabirhat, Kalapara & Kuakata, Kanaighat, Karimganj, Kasba, Kazipur, Kumarkhali, Lalmohan, Lohagara Narail, Madan, Madarganj, Maheshkhali, Mehendiganj, Mohanganj, Nabinagar, Nageshwari, Paikgachha, Patharghata, Ramganj, Ramgati, Sandwip, sariakandi, Sonagazi, Sujanagar, Teknaf, Ulipur, Zakiganj
	Upazilla_HQ	67	Alfadanga, Alikadam, Assasuni, Atpara, Austagram, Babuganj, Bahubal, Balaganj, Barkal, Basail, Batiaghata, Belabo, Belai Chhari, Bishwambarpur, Boalkhali, Char Bhadrasan, Char Rajibpur, Chauhali, Chilmari, Companiganj Sylhet, Dashmina, Daulatpur Manikganj, Debhata, Dharampasha, Dwarabazar, Dumuria, Fulchhari, Gazaria, Gosairhat, Gowainghat, Hizla, Itna, Jaintiapur, Jamalganj, Kaliganj Satkhira, Kalmakanda, Khalajuri, Koyra, Kutubdia, Langadu, Lohajang, Mahalchhari, Manpara, Mithamain, Naikhongchhari, Nasirnagar, Nazirpur, Nikli, Pekua, Rajnagar, Ramu, Raumar, Ruma, Rupsa, Sadarpur, Saghatta, Sarail, Shibbalaya, South Sunamganj, Subarnachar, Tahirpur, Tala, Tarail, Tazumuddin, Thanchi, Tongibari, UKhia

Spatial Urban Groups (SUG)

District wise SUG of each growth center in alphabetical order

District	Growth Center	SUG	
Bagerhat	Bagerhat Sadar	3	
	Chitalmari	4	
	Fakirhat	3	
	Kachua Bagerhat	4	
	Mollahat	4	
	Mongla	7	
	Morrelganj Bagerhat	7	
	Rampal	7	
	Sarankhola	7	
Bandarban	Alikadam	8	
	Bandarban Sadar	3	
	Lama	4	
	Naikhongchhari	8	
	Rowangchhari	4	
	Ruma	8	
Thanchi	8		
Barguna	Amtali	7	
	Bamna	4	
	Barguna Sadar	8	
	Betagi	4	
Barisal	Patharghata	8	
	Agailjhara	4	
	Babuganj	8	
	Bakerganj	7	
	Banaripara	4	
	Barisal Sadar (BCC)	6	
	Gaurnadi	3	
	Hizla	8	
	Mehendiganj	8	
	Muladi	7	
Bhola	Wazirpur	7	
	Bhola Sadar	7	
	Burhanuddin	8	
	Char Fasson	8	
	Daulat Khan	8	
	Lalmohan	8	
	Manpura	8	
	Tazumuddin	8	
	Bogra	Adamdighi	4
		Bogura Sadar	3
dhunat		8	
dhupchanchia		3	
gabtali		4	
kahaloo		4	
nandigram		3	
sariakandi		8	
Shajahanpur (Majhira)		3	
Bogra		3	
sherpur	3		
Shibganj Bogra	3		
Sonatola	3		

District	Growth Center	SUG	
Brahmanbaria	Akhaura	8	
	Ashuganj	7	
	Banchharampur	7	
	Brahmanbaria Sadar	7	
	Kasba	8	
	Nabinagar	8	
	Nasirnagar	8	
	Sarail	8	
	Chandpur	Chandpur Sadar	7
		Faridganj	3
Haimchar		7	
Haziganj		7	
Kachua Chandpur		7	
Matlab Dakshin		7	
Matlab Uttar (Sengarchar)		7	
Shahrasti		7	
Chittagong		Anowara	7
		Banshkhali	8
	Boalkhali	8	
	Chandanaish	3	
	Chattogram City (CCC)	6	
	Fatikchhari	7	
	Hathazari	7	
	Lohagara Chittagong	4	
	Mirsharai (Baraiarhat)	7	
	Patiya	7	
Rangunia	7		
Chuadanga	Raozan	3	
	Sandwip	8	
	Satkania	3	
	Sitakunda	7	
	Alamdanga	3	
	Chuadanga Sadar	3	
	Darshana (Damurhuda)	4	
	Jibannagar	4	
	Comilla	Barura	8
		Brahman Para	3
Burichang		3	
Chandina		3	
Chauddagram		7	
Cumilla Sadar (Cumilla CC)		2	
Daudkandi		7	
Debidwar		3	
Homna		7	
Laksam		7	
Meghna	7		
Monoharganj	7		
Muradnagar	7		
Nangalkot	7		
South Cumilla (Cumilla CC)	6		
Titash	7		

District	Growth Center	SUG	
Cox's Bazar	Chakaria	7	
	Cox's Bazar Sadar	8	
	Kutubdia	8	
	Maheshkhali	8	
	Pekua	8	
	Ramu	8	
	Teknaf	8	
	Ukhia	8	
	Dhaka	Dhaka City (DNCC & DSCC)	1
		Dhamrai	3
Dohar		8	
Keraniganj		4	
Nawabganj Dhaka		4	
Savar		3	
Biral		4	
Birampur		3	
Birganj		3	
Bochaganj (Setabganj)		4	
Dinajpur	Chirirbandar	4	
	Dinajpur Sadar	3	
	Fulbari	3	
	Ghoraghat	3	
	Hakimpur	4	
	Kaharole	4	
	Khansama	4	
	Nawabganj Dinajpur	4	
	Parbatipur	3	
	Alfadanga	8	
Faridpur	Bhanga	3	
	Boalmari	3	
	Char Bhadrason	8	
	Faridpur Sadar	7	
	Madhukhali	3	
	Nagarkanda	3	
	Sadarpur	8	
	Chhagalnaiya	7	
	Daganbhuiyan	7	
	Feni Sadar	7	
Fulgazi	4		
Feni	Parshuram	4	
	Sonagazi	8	
	Fulchhari	8	
	Gaibandha Sadar	3	
	Gobindaganj	3	
	Palashbari	3	
	Sadullapur	4	
	Saghatta	8	
	Sundarganj	4	
	Gaibandha	Gazipur Sadar (GCC & Tongi)	3
Kaliakair		3	
Kaliganj Gazipur		4	
Kapasias		4	
Sreepur Gazipur		3	

District	Growth Center	SUG
Gopalganj	Gopalganj Sadar	7
	Kashiani	7
	Kotalipara	3
	Muksudpur	7
	Tungipara	7
	Bahubal	8
	Baniachong	7
	Chunarughat	7
	Habiganj Sadar & Shayestaganj	7
	Lakhai	7
Habiganj	Madhabpur	7
	Nabiganj	7
	Bakshiganj	4
	Dewanganj	8
	Islampur	8
	Jamalpur Sadar	3
	Madarganj	8
	Melandaha	3
	Sarishabari	7
	Abhaynagar	3
Jamalpur	Bagherpara	3
	Benapole (Sharsha)	3
	Chaugachha	3
	Jashore Sadar	3
	Jhikargachha	3
	Keshabpur	3
	Manirampur	3
	Jhalokati Sadar	3
	Kanthalia	4
	Nalchity	3
Rajapur	4	
Jessore	Harinakunda	3
	Jhenaidaha Sadar	3
	Kaliganj Jhenaidaha	3
	Kotchandpur	4
	Maheshpur	4
	Shaikupa	4
	Akkelpur	4
	Joypurhat Sadar	3
	Kalai	3
	Khetlal	3
Jhalokati	Panchbibi	4
	Dighinala	4
	Khagrachhari Sadar	4
	Lakshnichhari	4
	Mahalchhari	8
	Manikchhari	4
	Matiranga	4
	Panchhari	4
	Ramgarh	4

District wise SUG of each growth center in alphabetical order

District	Growth Center	SUG	
Khulna	Batiaghata	8	
	Chalna (Dacope)	8	
	Dighalia	4	
	Dumuria	8	
	Khan Jahan Ali (KCC)	6	
	Khulna Sadar (KCC)	6	
	Koyra	8	
	Paikgachha	8	
	Phultala	3	
	Rupsa	8	
Kishoreganj	Terokhada	4	
	Austagram	8	
	Bajitpur	7	
	Bhairab	7	
	Hossainpur	3	
	Itna	8	
	Karimganj	8	
	Katiadi	7	
	Kishoreganj Sadar	3	
	Kuliar Char	7	
Kurigram	Mithamain	8	
	Nikli	8	
	Pakundia	7	
	Tarail	8	
	Bhurungamari	4	
	Char Rajibpur	8	
	Chilmari	8	
	Kurigram Sadar	7	
	Nageshwari	8	
	Phulbari	4	
Kushtia	Rajarhat	4	
	Raumar	8	
	Ulipur	8	
	Bheramara	7	
	Daulatpur Kushtia	4	
	Khoksa	4	
	Kumarkhali	8	
	Kushtia Sadar	3	
	Mirpur Kushtia	3	
	Lakshmipur Sadar	7	
Raipur	3		
Lakshmipur	Ramganj	8	
	Ramgati	8	
	Aditmari	4	
	Hatibandha	4	
	Kaliganj Lalmonirhat	4	
	Lalmonirhat Sadar	3	
	Patgram	4	
	Lalmonirhat	Kalkini	7
		Madaripur Sadar	7
		Rajoir	3
Shib Char		7	
Madaripur		Magura Sadar	3
		Mohammadpur	3
		Shalikka	3
		Sreepur Magura	3

District	Growth Center	SUG	
Manikganj	Daulatpur Manikganj	8	
	Ghior	4	
	Harirampur	7	
	Manikganj Sadar	3	
	Saturia	3	
	Shibalaya	8	
	Singair	4	
	Maulvibazar	Barlekha	8
		Juri	7
		Kamalganj	4
Kulaura		7	
Maulvi Bazar Sadar		7	
Rajnagar		8	
Sreemangal		7	
Meherpur		Gangni	3
		Meherpur Sadar	3
		Mujibnagar	3
	Munshiganj	Gazaria	8
		Lohajang	8
		Munshiganj Sadar & Mirkadim	8
		Serajdikhan	4
		Sreenagar	7
		Tongibari	8
		Mymensingh	Bhaluka
Dhobaura			4
Fulbaria			3
Gaffargaon			4
Gauripur	3		
Haluaghat	4		
Ishwarganj	3		
Muktagachha	3		
Mymensingh Sadar (MCC)	2		
Nandail	3		
Naogaon	Phulpur	4	
	Trishal	3	
	Atrai	4	
	Badalgachhi	4	
	Dhamoirhat	3	
	Mahadebpur	3	
	Manda	3	
	Naogaon Sadar	4	
	Nazipur (Patnitala)	3	
	Niamatpur	4	
Porsha	4		
Narail	Raninagar	4	
	Sapahar	4	
	Kalia	7	
	Lohagara Narail	8	
	Narail Sadar	3	
	Narayanganj	Araihazar	7
		Bandar (NCC) & Tarabo	2
		Narayanganj Sadar (NCC) & Shiddhirganj	2
		Rugganj & Kanchan	3
		Sonargaon	7

District wise SUG of each growth center in alphabetical order

District	Growth Center	SUG	District	Growth Center	SUG	District	Growth Center	SUG
Narsingdi	Belabo	8	Patuakhali	Bauphal	8	Sherpur	Jhenaigati	4
	Ghorashal (Palash)	3		Dashmina	8		Nakla	3
	Manohardi	3		Dumki	7		Nalitabari	3
	Narsingdi Sadar & Madhabdi	7		Galachipa	8		Sherpur Sadar	3
	Raypura	7		Kalapara & Kuakata	8	Sreebardi	4	
	Shibpur	3		Mirzaganj	4	Belkuchi	8	
				Patuakhali Sadar	7	Chauhali	8	
Natore	Bagati Para	4	Pirojpur	Bhandaria	3	Sirajganj	Kamarkhanda	4
	Baraigram & Banpara	4		Kawkhali Pirojpur	4		Kazipur	8
	Gopalpur (Lalpur)	4		Mathbaria	7		Royganj	3
	Gurudaspur	3		Morrelganj (Zianagar)	7		Shahjadpur	7
	Natore Sadar & Naldanga	4		Pirojpur	8		Sirajganj Sadar	7
	Singra	4		Nazirpur	8		Tarash	3
				Nesarabad (Swarupkati)	3		Ullah Para	3
Nawabganj	Bholahat	4	Rajbari	Pirojpur Sadar	3	Sunamganj	Bishwambarpur	8
	Nachole	4		Balia Kandi	3		Chhatak	7
	Nawabganj Sadar	8		Goalandaghat	7		Derai	8
	Rahanpur (Gomastapur)	4		Pangsha	7		Dharampasha	8
	Shibganj Nawabganj	4		Rajbari Sadar	7		Dowarabazar	8
Netrakona	Atpara	8	Rajshahi	Bagha & Arani	4		Jagannathpur	7
	Barhatta	4		Bhabanigonj (Baghmara) & Tahirpur	4		Jamalganj	8
	Durgapur Netrakona	8		Charghat	4		South Sunamganj	8
	Kalmakanda	8		Durgapur Rajshahi	4	Sulla	7	
	Kendua	4		Godagari & Kakanhat	4	Sunamganj Sadar	8	
	Khaliajuri	8		Kesharhat (Mohanpur)	4	Tahirpur	8	
	Madan	8		Poba & Katakhal & Noahata	4	Balaganj	8	
	Mohanganj	8		Puthia	3	Beanibazar	8	
	Netrokona Sadar	3		Rajshahi Sadar (RCC)	6	Bishwanath	7	
	Purbadhala	3		Tanore & mundumala	4	Companiganj Sylhet	8	
Nilphamari	Dimla	4	Rangamati	Baghai Chhari	8	Fenchuganj	7	
	Domar	4		Barkal	8	Golabganj	7	
	Jaldhaka	4		Belai Chhari	8	Gowainghat	8	
	Kishoreganj	4		Jurai Chhari	4	Jaintiapur	8	
	Nilphamari Sadar	4		Kaptai	7	Kanaighat	8	
Noakhali	Saidpur	3	Rangpur	Kawkhali Rangamati	7	South Surma (Sylhet CC)	6	
	Begumganj (Chowmuhani)	7		Langadu	8	Sylhet Sadar (Sylhet CC)	6	
	Chatkhil	8		Naniarchar	4	Zakiganj	8	
	Companiganj (Bashurhat) Noakhali	8		Rajasthali	3	Basail	8	
	Hatiya	8		Rangamati Sadar	7	Bhuapur	8	
	Kabirhat	8		Badarganj	3	Delduar	4	
	Noakhali Sadar	7		Gangachara	4	Dhanbari	3	
Pabna	Senbagh	7	Satkhira	Haragacha (Kaunia)	4	Ghatail	3	
	Sonaimuri	7		Mitha Pukur	4	Gopalpur	4	
	Subarnachar	8		Pirgachha	4	Kalihati	7	
	Atgharia	8		Pirganj Rangpur	3	Madhupur	3	
	Bera	7		Rangpur Sadar (Rangpur CC)	2	Mirzapur	3	
	Bhangura	7		Taraganj	3	Nagarpur	4	
	Chatmohar	8		Shariatpur	Assasuni	8	Sakhipur	3
Faridpur	8	Debhata	8		Tangail Sadar	7		
Ishwardi	7	Kalaroa	3		Baliadangi	3		
Pabna Sadar	7	Kaliganj Satkhira	8		Haripur	4		
Santhia	7	Satkhira Sadar	7		Pirganj Thakurgaon	4		
Sujanagar	8	Shyamnagar	7		Ranisankail	4		
Panchagarh	Atwari	4	Tala		8	Thakurgaon Sadar	3	
	Boda	3	Bhedarganj	8				
	Debiganj	4	Damudya	8				
	Panchagarh Sadar	3	Gosairhat	8				
	Tentulia	4	Naria	7				

Data Compiled by GIS Lab UDD, 2020

Spatial Urban Groups (SUG)

All 484 growth centers of Bangladesh are graphically classified into 8 (eight) distinct Spatial Urban Groups (SUG). This study suggests that these different SUG needs different urban policy guidelines. Different intervention is necessary for growth centers in different SUG to achieve that readiness status overcoming ecological constrain and proper reinforcement of existing infrastructure-service. Policy requirement for different growth centers must be different from each other. Ecological suitability of a growth center cannot be changed, but risk sensitive urban planning and policy can overcome their fragility and ensure sustainable development.



Buffalo pulled indigenous vehicle carrying grain from paddy field
Sunamganj District

Picture collected from: internet



Cox's Bazar Sea Beach
Cox's Bazar District



Satala Lily Village

Satla village, Uzirpur upazila, Barisal District