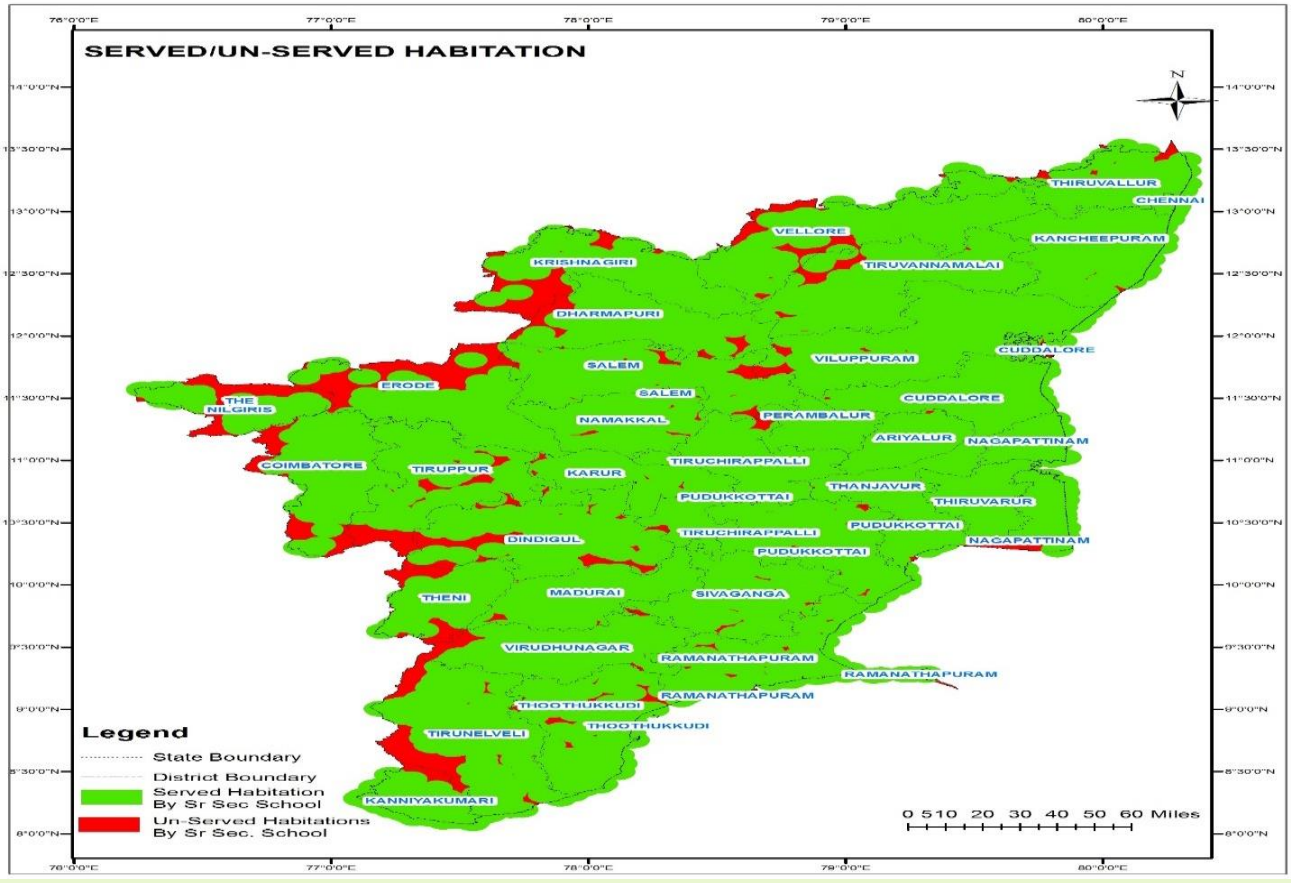
पढ़े चलो, बढ़े चलो

RASHTRIYA MADHYAMIK SHIKSHA ABHIYAN

A REPORT ON
UPGRADATION OF HIGH SCHOOL TO HIGHER SECONDARY SCHOOLS THROUGH GIS BASED SCIENTIFIC ANALYSIS OF 32 DISTRICTS OF TAMIL NADU



FOR STATE PROJECT OFFICE,
RASHTRIYA MADHYAMIK SHIKSHA ABHIYAN, TAMAIL NADU

BY BHOOMI EDUCATIONAL CONSULTANCY, NEW DELHI

Acknowledgement

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Chairperson,
Bhoomi Educational Consultancy

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EXECUTIVE SUMMARY

Background

Education in India is funded and managed by the government. Therefore, investment decisions by the Government determine the pattern of expansion of educational facilities. Over a period, it is noticed that specific areas are more endowed with school facilities than other areas. In Uttar Pradesh, regional inequalities in the distribution of schooling facility have also been seen as such. Hence GIS mapping technology has been chosen for mapping of schools and identifies gaps and areas where new schools need to be opened. The strength of Information Technology in the form of GIS technology, entire schooling facility may be overlaid on a satellite image (open source) with the facility for zooming, resizing and scrolling, which may be used for decision making at all level from the state level to school level in the state.

The current project has addressed the goal of universal access to higher secondary schools by way of providing a school within a reasonable distance of 7 km area to ensure access for universal enrolment of children in higher secondary schools. The aim of the project is to prepare a proposal for establishing a higher secondary school in unserved areas mainly through upgradation of secondary school. For this purpose, *Geographical Information System based Solution* has been used, which can help "*state education department*" in planning for establishing higher secondary schools in minimum locations.

Main findings

After carrying out GIS base analysis in all 32 districts by generating the queries, following corresponding results have been observed.

Objective 1: -

To prepare an Integrated GIS map of Schools & location of all habitations as per Census 2011 for all 32 districts.

Finding 1: -

In the GIS map, total 92234 habitation points have been mapped as per census of India 2011. For habitation identification, a sheet has also been prepared on the basis of the census of India 2011, and further, the discrepancies have been shorted out. After preparation of corrected digitized sheet of habitation points and school points and an integrated GIS maps have been prepared for all 32 districts.

Objective 2: -

To check the availability of Higher secondary school within 7 km as per national norm and identification of Un-served area based on national Norms.

Finding 2: -

Out of 92234 habitations in 32 districts, total 90550 habitations are covered with the higher secondary schools within 7 km distance, whereas total **1684 habitations do not have higher secondary schooling facility**.

Summary of habitations and planning to serve all habitations with higher secondary schools

state	District	No. of Block	No. of Habitations	No. of Habitations covered by Higher Sec School in 7km areas	No. of Habitations without Higher Sec School in 7 Km radius
Tamilnadu	**32**	**216**	**92234**	**90550**	**1684**

Objective 3: -

Identification of most suitable location for proposed school based on the demography.

Finding 3: -

As far as most suitable location for proposed school based on demography is concerned, out of total 1684 un-served habitations, total 93 secondary schools have been proposed for up-gradation into higher secondary schools with all three subject streams, i.e., Arts, Science, and Commerce. To cover all the habitations with higher secondary schools, state needs to upgrade 93 secondary schools into higher secondary schools, 18 new stand-alone schools and in 54 cases. they need to adopt other strategy like transport facility etc.

state	**District**	**No. of Habitations without Higher Sec School in 7 Km radius**	**Total no of Higher secondary schools to be up-graded**	**No of new stand-alone schools required**	**Number of cases required other strategy like transport facility etc.**
Tamilnadu	**32**	**1684**	**93**	**18**	**54**

For identifying a most suitable location, criterion of maximum enrollment in secondary school, land availability in the proposed school location, the distance between two secondary schools, have been applied . after selection of schools, thematic maps of Identified most suitable location of proposed school based on the demography has been prepred.

Objective 4: -

To prepare proposal of schools for the establishing higher secondary schools

Finding 3: -

A suggestive proposal for upgrading a secondary school into higher secondary school has been prepared for further reference.

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Introduction

Education in India is funded and managed by the government. Therefore, investment decisions by the Government determine the pattern of expansion of educational facilities. Over a period time, it is noticed that specific areas are more endowed with school facilities than other areas. In Tamil Nadu, regional inequalities in the distribution of schooling facility have also been seen as such. Hence GIS mapping technology has been chosen for mapping of schools and identifies gaps and areas where new Higher secondary schools need to be opened. The strength of Information Technology in the form of Geographic Information System, entire schooling facility may be overlaid on a satellite image (open source) with the facility for zooming, resizing and scrolling, which may be used for decision making.

The current project has addressed the goal of providing access to Higher Secondary Schools by way of providing a subject stream at a higher secondary level within a reasonable distance of 7 km area. The aim of the project is to identify suitable location to open a higher secondary school to cover all the habitations, through the help of ***Geographical Information System based Solution***. In this regard, a justifiable proposal for upgrading secondary schools into higher secondary school has also been prepared for further use.

Overview of the project

Project Title:	GIS mapping of higher secondary schools and analysis of Unserved area specifically for higher secondary schools
Principal coordinator: -	Shailesh Pathak
Project location: -	32 districts of Tamilnadu
Place of Work:	New Delhi,
Work Field:	Secondary and Higher Secondary Schools
Project Duration:	three Months (2 Aug 2017 – 30 October, 2017)
Platform:	Windows 7
Software Used:	Arc GIS 10.1,
Operating System:	Windows 7

Objectives of the Project:

The project aims to develop Integrated GIS school map with the habitations as per census 2011 and administrative boundaries to perform a GIS-based analysis which can help "Tamilnadu education department" in planning, policy implementation and administration of the education system of Higher secondary schools. In this regard, a justifiable proposal for upgrading secondary schools into higher secondary school has also been prepared for further use. Following primary objectives are set for this project:

1. To prepare an Integrated GIS map of Schools & location of all habitations as per Census 2011.
2. To check the availability of Higher secondary school within 7 km as per national norm and identification of Un-served area based on national Norms.
3. Identification of most suitable location for proposed school based on the demography
4. To prepare proposal of schools for the establishing higher secondary schools

Methodology

GIS process methodology: - The following methodology has been used for execution of the Analysis:

Stage-1

School location (latitude and longitude) has been taken from secondary schools to higher secondary school of all the district.

Stage-2

Habitational points with relevant information from Administrative Atlas (Census of India,2011) has been taken.

Stage-3

Existing school information has been integrated with school location data with using their UDISE code for find out the proposed school location on using parameters like, land availability, enrolment, distance etc.

Stage-4

School location over habitation base map have been superimposed on GIS software for further analysis. In this process Software : Arc GIS 10.1, Operating System: Windows 7, Processor : I 7 have been used for GIS based analysis.

Steps used for analysis

For identification of Un-served area we have used buffer analysis, in this process following steps have been followed: -

1. School locations have been superimposed over habitation based map.
2. To identify the un-served area, create a buffer of 7 km on secondary schools' location and intersected that buffer with habitation points.
3. The habitational points, which were coming outside the buffer has been considered as un-served area.
4. Existing school information which has been integrated with school location data with using their UDISE code was used for find out the proposed school location.
    - It is also mentioned that that the state has total 12864 secondary with higher secondary schools in which school coordinates were available and matched with 12573 schools. Due to time constraint and unavailability of data of remaining 291 schools, total 12573 schools were analysed.
5. For identifying a most suitable location, criterion of maximum enrollment in secondary school, land availability in the proposed school location, the distance between two secondary schools, have been applied.
    - For identifying served habitation, buffer of 7km of higher secondary schools has been taken as per national norm, however this buffer has been extended up to 7.5km while serving of one or two habitation falls within the radius of 7.5km, considering the aerial distance can be more than the actual walking distance.
    - On the other hand in some cases, for identifying served habitation, buffer of 7km of higher secondary schools has been taken as per national norm, however this buffer has been restricted up to 6.5 km as one or two habitation falls outside the radius of 6.5km, considering the aerial distance can be less than the actual walking distance.
    - In case of unavailability of secondary school for upgradation, the stand-alone school has been proposed for covering unserved habitations. In these cases, the criteria for habitation selection for establishing higher secondary school was nearby landmark like availability of school building, anganbadi, water availability etc as per census 2011.
    - For selection of school for establishing higher secondary school criterion of maximum enrollment in secondary school, land availability in the proposed school location, the distance between two secondary schools, have been applied. the selection of these location was also prioritizing accordingly.

- For selection of suitable location, the criteria of availability of land was used for prioritization however this criterion was not restricted for selection the location considering the fact that the state/ district can provide land in the location and establish the school.
- Out of 93 proposed school locations for establishing higher secondary schools, 16 schools do not have land. In these cases, the state needs to provide land to the schools to establish schools and then consider school for upgradation.

6. After selection of schools, thematic maps of Identified most suitable location of proposed school based on the demography has been prepared, which is attached at "Annexure 1 to 32 thematic maps" for further reference.

Main findings of the project

After carrying out GIS base analysis in all 32 districts by generating the queries, following corresponding results have been observed.

Objective 1: -

To prepare an Integrated GIS map of Schools & location of all habitations as per Census 2011 for all 32 districts.

Finding 1: -

In the GIS map, total 92234 habitation points have been mapped as per census of India 2011. For habitation identification, a sheet has also been prepared on the basis of the census of India 2011, and further, the discrepancies have been shorted out. After preparation of corrected digitized sheet of habitation points and school points, an integrated GIS maps have been prepared for all 32 districts.

Objective 2: -

To check the availability of Higher secondary school within 7 km as per national norm and identification of Un-served area based on national Norms.

Finding 2: -

Out of 92234 habitations in 32 districts, total 90550 habitations are covered with the higher secondary schools within 7 km distance, whereas total **1684 habitations do not have higher secondary schooling facility**. District wise details of the unserved area is as followed:-

District wise details of Unserved habitations as per national norm

S.No	District Name	No. of Block	No. of Habitations	No. of Habitations covered by Higher Sec School in 7km areas	No. of Habitations without Higher Sec School in 7 Km radius
1	THIRUVALLUR	9	4221	4138	83
2	CHENNAI	1	155	155	0
3	KANCHEEPURAM	10	4097	4087	10
4	VELLORE	9	6730	6596	134
5	TIRUVANNAMALAI	7	4534	4470	64
6	VILUPPURAM	8	3824	3766	58
7	SALEM	9	5790	5708	82
8	NAMAKKAL	4	2967	2929	38
9	ERODE	5	3991	3897	94
10	THE NILGIRIS	6	1578	1520	58
11	DINDIGUL	8	3570	3462	108
12	KARUR	5	2422	2376	46
13	TIRUCHIRAPPALLI	9	2599	2572	27
14	PERAMBALUR	3	395	387	8
15	ARIYALUR	3	779	779	0
16	CUDDALORE	7	2835	2803	32
17	NAGAPATTINAM	8	2293	2293	0
18	THIRUVARUR	7	1920	1920	0
19	THANJAVUR	8	2725	2721	4
20	PUDUKKOTTAI	11	4248	4224	24
21	SIVAGANGA	6	2999	2952	47
22	MADURAI	7	2267	2263	4
23	THENI	5	1120	1076	44
24	VIRUDHUNAGAR	8	2126	2124	2
25	RAMANATHAPURAM	7	2525	2494	31
26	THOOTHUKKUDI	8	2165	2123	42
27	TIRUNELVELI	11	3159	3128	31
28	KANNIYAKUMARI	4	2171	2161	10
29	DHARMAPURI	5	3019	2986	33
30	KRISHNAGIRI	5	4154	3809	345
31	COIMBATORE	6	1975	1906	69
32	TIRUPPUR	7	2881	2725	156
	TOTAL	**216**	**92234**	**90550**	**1684**

Objective 3: -

Identification of most suitable location for proposed school based on the demography

Finding 3: -

As far as most suitable location for proposed school based on demography is concerned, out of total 1684 un-served habitations, total 93 secondary schools have been proposed for up-gradation into higher secondary schools with all three subject streams, i.e., Arts, Science, Commerce. To cover all the habitations with higher secondary schools, state needs to upgrade 93 secondary schools into higher secondary schools, 18 new standalone schools and in 54 cases. they need to adopt other strategy like transport facility etc.

District wise details of new institutions required for covering all the habitations with the higher secondary schooling facility

S.N	District Name	No. of Habitations without Higher Sec School in 7 Km radius	Total no of govt sec schools to be up-graded into senior secondary schools to cover all the habitations	No of new stand-alone schools required	Number of cases required other strategy like transport facility etc.
1	THIRUVALLUR	83	4	2	4
2	CHENNAI	0			
3	KANCHEEPURAM	10	1		
4	VELLORE	134	8		2
5	TIRUVANNAMALAI	64			1
6	VILUPPURAM	58	2	2	3
7	SALEM	82	7		
8	NAMAKKAL	38	3		
9	ERODE	94	10	3	13
10	THE NILGIRIS	58	5	1	3
11	DINDIGUL	108	8	2	2
12	KARUR	46	3		2
13	TIRUCHIRAPPALLI	27	1		
14	PERAMBALUR	8	1		
15	ARIYALUR	0			
16	CUDDALORE	32		2	
17	NAGAPATTINAM	0			
18	THIRUVARUR	0			

S.N	District Name	No. of Habitations without Higher Sec School in 7 Km radius	Total no of govt sec schools to be up-graded into senior secondary schools to cover all the habitations	No of new stand-alone schools required	Number of cases required other strategy like transport facility etc.
19	THANJAVUR	4	1		
20	PUDUKKOTTAI	24	3		
21	SIVAGANGA	47	4		
22	MADURAI	4			
23	THENI	44	1	2	2
24	VIRUDHUNAGAR	2			1
25	RAMANATHAPURM	31	2		1
26	THOOTHUKKUDI	42	3	1	3
27	TIRUNELVELI	31	4		2
28	KANNIYAKUMARI	10	1	1	
29	DHARMAPURI	33	4		4
30	KRISHNAGIRI	345	12	1	6
31	COIMBATORE	69	5	1	5
32	TIRUPPUR	156			
	TOTAL	1684	93	18	54

For identifying a most suitable location, criterion of maximum enrollment in secondary school, land availability in the proposed school location, the distance between two secondary schools, have been applied. after selection of schools, thematic maps of Identified most suitable location of proposed school based on the demography has been prepared.

Objective 4: -

To prepare proposal of schools for the establishing higher secondary schools

Finding 3: -

A proposal for upgrading a secondary school into higher secondary school has been prepared for 32 districts for further reference, which is attached at Annexure ‘A’ ‘B’ and ‘C’.

Future perspective

In the project, the team worked specifically for the gaps in higher secondary education in the state. In future the project would be concerned about finding gaps in subject stream which is unavailable in particular area and proposal for covering all the habitation with subject stream studying in the higher secondary level.

The teacher rationalization is one of the difficult tasks for the state, which also can be done through GIS technology which will be beneficial to the state in terms of better planning, and teacher management.

The Shortest route/ transportation root/ navigation from the school to habitation can be further analyzed for all schools, which will be beneficial for the students and their parents.

Mapping of Residential schools, residential hostels, can be done and analysis of transportation and residential facility in the state can also be analyzed through the GIS mapping exercise.

Mapping of vocational schools and available industry can be done. On the basis of available industry need for vocational stream in particular area can be analyzed. Generation of analytical maps as per available queries may also be done through the GIS mapping.

A web-based GIS integrated package may also be developed for school education for the state.

Our work in the project is just a prototype of the entire package which is still to be developed for the education of India. The accumulated knowledge, data and information of our project can easily be used for identifying existing gap in the schooling facility in the state, in future days in the advanced fields of Information Technology and Geographical Information System based development.

The end product of the entire project will be a customizable GIS package which will be beneficial to the state in terms of better planning, management and enhanced productivity and profitability as well as country in a whole.

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Annexures

Annexure :- (A)

- List of schools proposed for upgradation from high schools to higher secondary level is in excel sheet.

Annexure :- (B)

- List of new stand schools proposed for cover all habitation with higher secondary schools is in excel sheet.

Annexure :- (C)

- List of 55 habitations which needs other strategy like transportation and residential facility to cover with higher secondary schools is in excel sheet.

District wise thematic maps

Annexure (1) to Annexure (32)

- The District wise thematic maps are yet to be attached and sent shortly