

## **A GEOGRAPHICAL STUDY ON THE SPATIAL DISTRIBUTION OF BASIC EDUCATION SCHOOLS IN SINGAING TOWNSHIP, MANDALAY REGION**

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### **Abstract**

This research work emphasizes on the spatial distribution of basic education schools in Singaing Township. It is focused on the facts of topographic conditions, age structure, the distribution of population, number of students and basic education schools. Although the western two-thirds of Singaing Township is flat plain, the rest located in the eastern part is the continuation of Shan Highland. Moreover, the study area is an agricultural region, and *inns*, lakes, weirs and canals are mostly found. For these conditions, there are many physical barriers that can impact on students. So, the followings were laid down as the research questions. (1) What is the spatial distribution pattern of basic education schools in Singaing Township? (2) How far the students have taken to travel to attend for their basic education? (3) Where is it necessary to allocate new school or to upgrade the existing school? To answer the above questions, both spatial (location) and attribute (function) data with regard to basic education schools are collected by field survey. Necessary data are obtained from various government offices. In this study, the numbers of basic education schools with their respective students are recognized in (2016-17) Academic Year. Then, their spatial distribution patterns are analyzed by using spatial statistical analysis, especially point density analysis and buffer analysis. As a result, the villages which have no primary school (BEPS) and the middle schools (BEMS) that need to upgrade into high school (BEHS) could be observed.

**Key words:** spatial distribution, basic education school, physical barrier, spatial statistical analysis, point density, buffer analysis.

### **Introduction**

Education is a basic human need. Only when people are well educated and skillful in modern technologies, they can gain their life struggle for food, clothing and shelter. Being a developing country, Myanmar cannot be well-developed with human resources into a high quality of life. In fact, child

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labour is applied in various parts of the country instead of educating the children. Early leaving of school education for child labour is particularly true for rural areas where basic infrastructures were poorly provided for the majority of rural population due to a number of reasons, such as cost, consideration, lower population, rugged terrain, etc. It is estimated that over one million children are still out of school in Myanmar. Primarily, there are two types of education in Myanmar: Basic Education and Higher Education. This paper intends to analyze the condition of Basic Education only in the study area.

### **Basic Education**

Primary education is the first stage of basic education and is compulsory. Primary education lasts five years, including the reception year (kindergarten or grade 1); it is organized in two cycles; lower primary (Grades 1 to 3), and upper primary (Grades 4 and 5). Although the admission age is 5+, many children are entering to grade 1 at over 6 years of age. At the end of primary education, pupils have to sit for an examination.

Secondary education is the second stage of basic education and comprises of two cycles; lower secondary or middle school lasting four years (Grades 6 to 9), and upper secondary or high school (Grades 10 and 11).

### **Research Questions**

Following research questions are tried to answer in this paper.

- (1) What is the spatial distribution pattern of basic education schools in Singaing Township?
- (2) How far the students have taken to travel to attend for their basic education?
- (3) Where is it necessary to allocate new school or to upgrade the existing school?

## Data and Methods

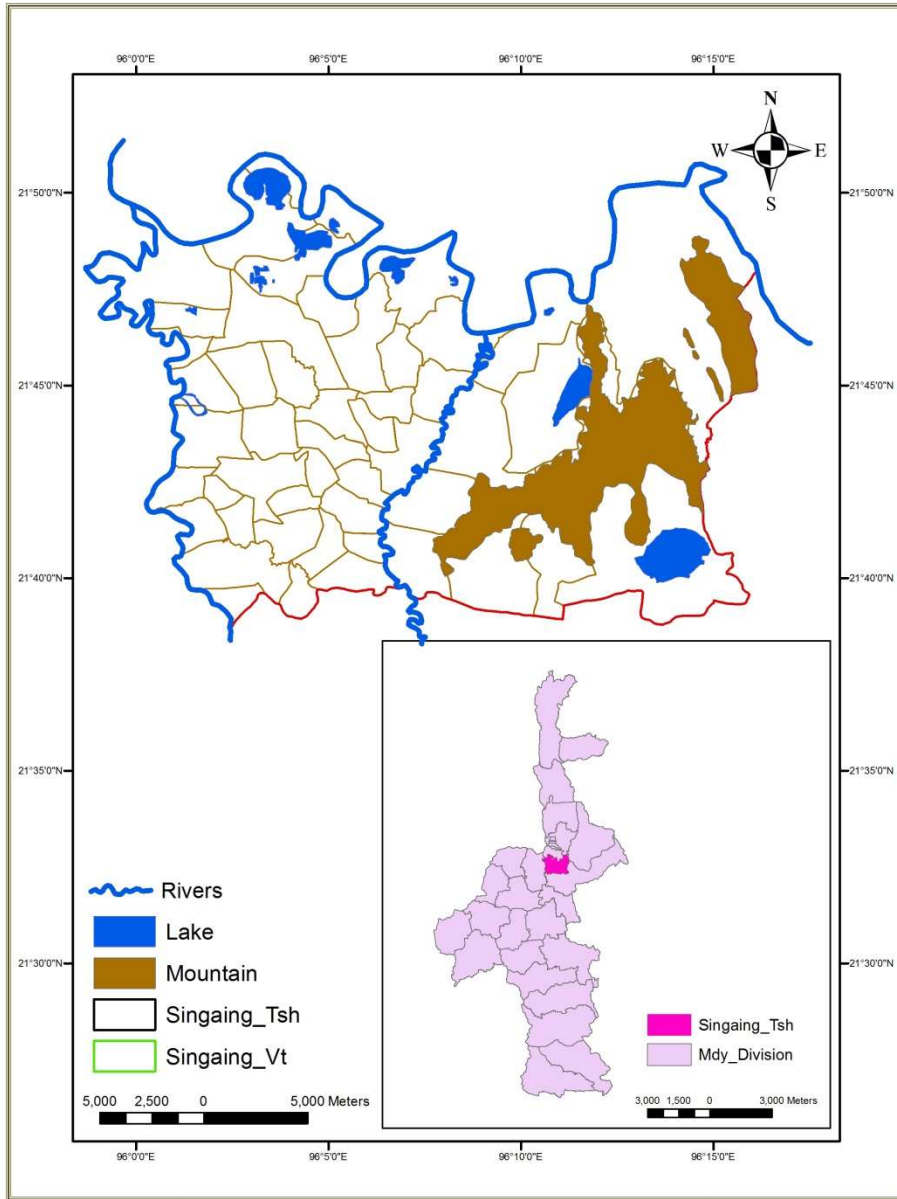
Firstly, primary data were collected by field survey. And then, secondary data were collected from various government offices such as Township Land Records Department, Immigration and National Registration Department, Township General Administration Department and Township Education Office (TEO). Based on the data collected from both primary and secondary sources, the processing and analytical patterns are conducted by means of GIS Techniques. Point density analysis, buffer analysis and spatial statistical method in this study.

## Physical Factors of Study Area

Singaing Township is located in Kyaukse District, Mandalay Region, in the Central Lowland of Myanmar. It lies on the Mandalay-Kyaukse Plain. It is located between the North Latitude 21° 39' to 21° 51' and the East Longitude of 95° 59' to 96° 17'. Singaing Township is composed of 5 urban wards and 48 village tracts (163 villages). It has an area of 448.65 square kilometers (173.18 square miles). It is nearly compact shape. The township is bounded on the north by Amarapura and Patheingyi townships, on the east and south by Kyaukse Township and on the west by Tada-U Township. In the north and west, Myitnge River and Panlaung River serve as natural boundary, respectively. The eastern boundary is defined by the Nattabin *taungdan* (range) and further south by Dattaw *taung* (mountain).

A large portion in the western part of the study area lies in the 250' to 76-152 m (500' feet) above sea level. But its eastern part is the continuation of Shan Highland. Here, the low ranges rise to 609 m (2,000 feet) and mountains are 152 m (500 feet) to 305 m (1,000 feet) high above sea level. Myitnge, Zawgyi and Panlaung Rivers and their tributaries drain in this area. There is also an irrigation network system (weirs and canals) along Zawgyi and Panlaung Rivers for agriculture. There are some well-known *Inns* (lakes) such as Sunye, Paleik, Inhlya, Taon, Minhla *Kan* and Nyaunbintha *Kan*.

Map(1). Location of Study Area



Source: Township Land Records Department, Singaing Township

### Social Factors of Study Area

#### Population

In2016, total population of Singaing Township is 144,410. The average population density of Singaing Township was 448 persons per square mile (173 persons per square kilometer) in 1973; it rose to 684 persons per square mile (264 persons per square kilometer) in 1993 and again to 834 persons per square mile(322 persons per square kilometer) in 2016.

**Table 1.** Average Population Density of Singaing Township

Year	Total Population	Population Density	
		per sq.miles	per sq. kilometer
1973	77,641	448	173
1983	99,729	576	222
1993	118,530	684	264
2003	139,515	806	311
2016	144,410	834	322

**Source:** Immigration and National Registration Department, Singaing Township

**Table 2.** Age Groups of Singaing Township (2016)

No.	Ward & village tract	Total Population	Age		Remark
			< 18 years	>18 years	
1	Myoma	2,085	687	1,398	Wards
2	Myothit	1,325	478	847	
3	Yannaing	1,247	417	830	
4	Tayokesu	1,781	557	1,224	
5	Yanaungmyin	1,713	559	1154	
6	Katheakone	606	190	416	Village Tracts
7	Kanswe	778	244	534	
8	Kanthit	836	288	548	
9	Kyetseint	1,080	339	741	
10	Kyethmyar	1,208	379	829	
11	Kyetsha	691	217	474	

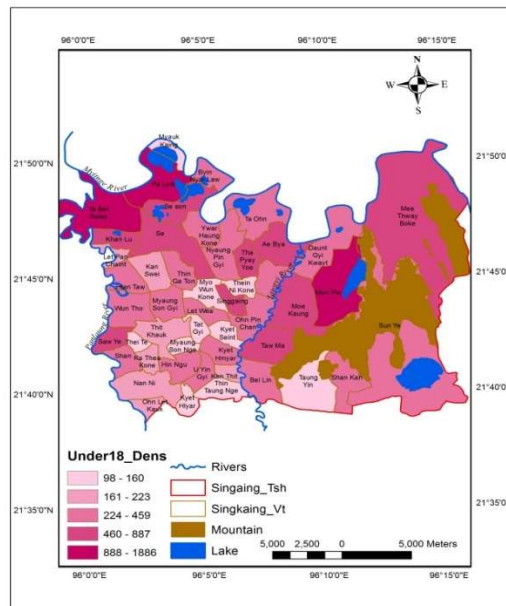
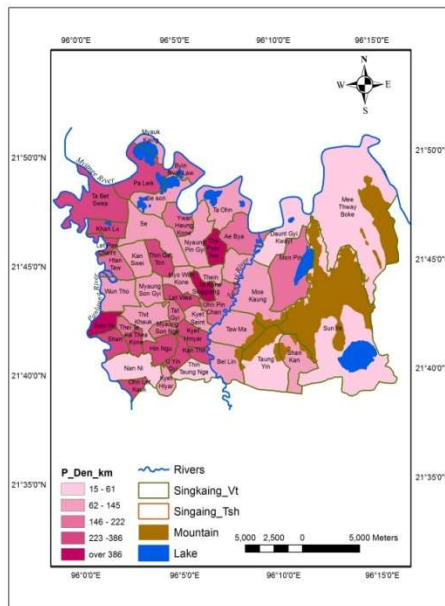
No.	Ward & village tract	Total Population	Age		Remark
			< 18 years	>18 years	
12	Khanlu	2,616	821	1,795	Village Tracts
13	Sawye	1,984	623	1,361	
14	Sunye	6,349	1,768	4,581	
15	Sisone	2,740	1108	1,632	
16	Seywa	5,300	1,901	3,399	
17	Nyaungbingyi	3,096	973	2,123	
18	Tabetswe	7,679	2,123	5,556	
19	Ta ohn	2,247	707	1,540	
20	Tawma	3,298	1,035	2,263	
21	Taungyin	2,253	845	1408	
22	Tatkyi	463	145	318	
23	Htandaw	1,686	605	1,081	
24	Daunggyigway	2,859	915	1,944	
25	Nanni	2,809	863	1,946	
26	Paleik	21,710	6,042	15,668	
27	Byinnyarlaw	1,345	422	923	
28	Belin	4,885	1,337	3,548	
29	Moekaung	5,113	1,629	3,484	
30	Mithwayboke	8,285	2,631	5,654	
31	Monbaung	858	269	589	
32	Monbin	5,000	1,593	3,407	
33	Myowungone	2,088	625	1,463	
34	Myaukkaing	2,587	813	1,774	
35	Shanywa	918	288	630	
36	Myaungzongyi	1,028	323	705	
37	Myaungzonnge	564	178	386	
38	Ywahaunggone	1,933	607	1326	
39	Shangan	3,107	976	2131	
40	Letpangyaing	930	293	637	
41	Letwe	1,749	550	1,199	
42	Wuntho	2,569	807	1,762	
43	Thabyeyo	2,964	931	2,033	

No.	Ward & village tract	Total Population	Age		Remark
			< 18 years	>18 years	
44	Thindaung	988	313	685	
45	Thitkhauk	3,563	1,120	2,443	
46	Thingadon	1,285	404	881	
47	Thede	333	105	228	
48	Theinnigone	1,419	498	921	
49	Hinngu	2,892	916	1,983	
50	U yingyi	975	306	699	
51	E bya	2,927	890	2,037	
52	Ohnbinchan	2,775	871	1,904	
53	Ohnletkauk	891	280	611	
	Total	144,410	44,787	99,623	

Source: Immigration and National Registration Department, Singaing Township

Map 2. Population Density of Village Tracts in Singaing Township (2016)

Map 3. Population Density (< 18 years) of Village Tracts in Singaing Township (2016)

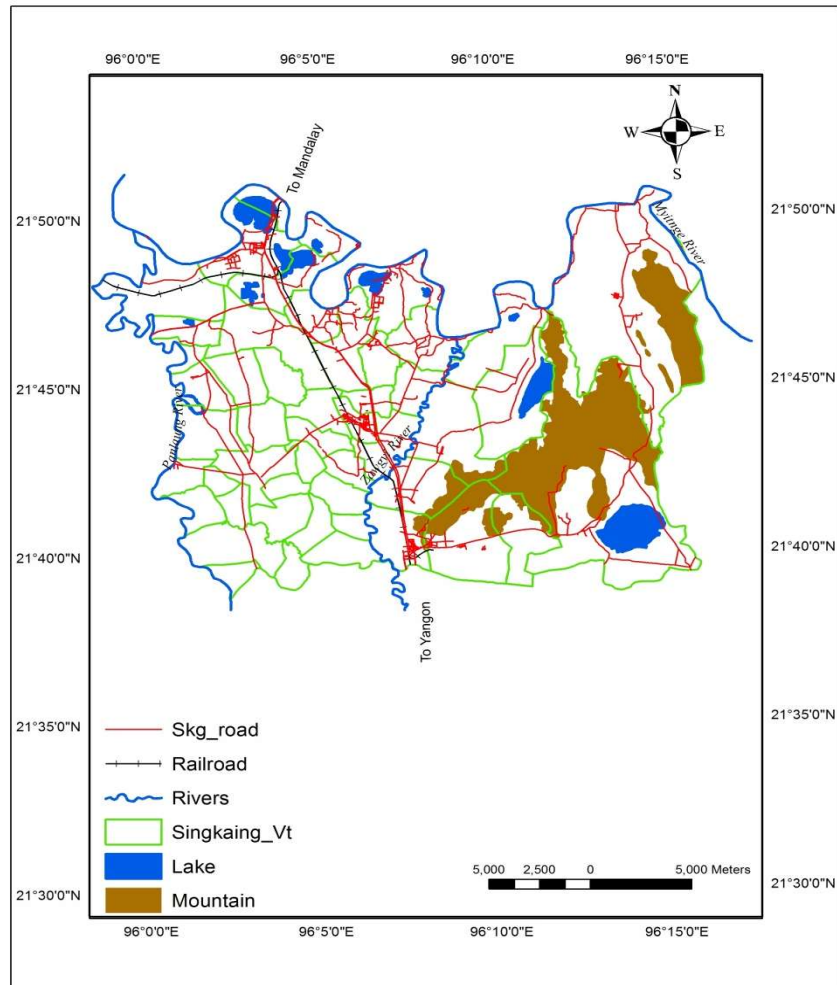


Source: Immigration and National Registration Department, Singaing Township

## Transportation

Yangon–Mandalay Highway (old) passes through central portion of Singaing Township. Likewise, Yangon–Mandalay and Mandalay–Nyaung U railroads pass through it. About one third of all roads in Singaing Township are tar roads and can travel in all seasons. The remainings are earthen and macadam roads and they are seasonal roads only. They are used by motor-cycles, trawlergies, bicycles and carts or as footpath.

Map (4) Transportation Map of Study Area



Source: Land Records Department, Singaing Township



**Education**

Singaing Township has four high schools (BEHS), seven branch (affiliated) high schools (Sub BEHS), one middle school (BEMS), sixteen branch middle schools (Sub BEMS), one post primary school (Post BEPS), eighty primary schools (BEPS) and three branch primary schools (Sub BEPS) totally with 22,927 students in (2016-2017) Academic Year. There are totally 112 government basic education schools and 4 private schools (Paleik-1, Ohnbinchan-1 and Singaing-2). The total numbers of students at these private schools were 2017 (High school students – 986, Middle school students – 578, Primary school students – 453) in this Academic Year. In (2017-18) Academic Year, 16 of all schools were upgraded to the next level from existing level.

**Table 3.** Numbers of Basic Education School

Level	Type	Number of Schools		Number of Students (2016-17) Academic Year
		(2016-17) Academic Year	(2017-18) Academic Year	
High School	BEHS	4	5	2,103
	Sub - BEHS	7	6	
Middle School	BEMS	1	12	7,919
	Sub - BEMS	16	5	
	Post BEPS	1	3	
Primary School	BEPS	80	81	12,905
	Sub - BEPS	3	-	
<b>Total</b>		<b>112</b>	<b>112</b>	<b>22,927</b>

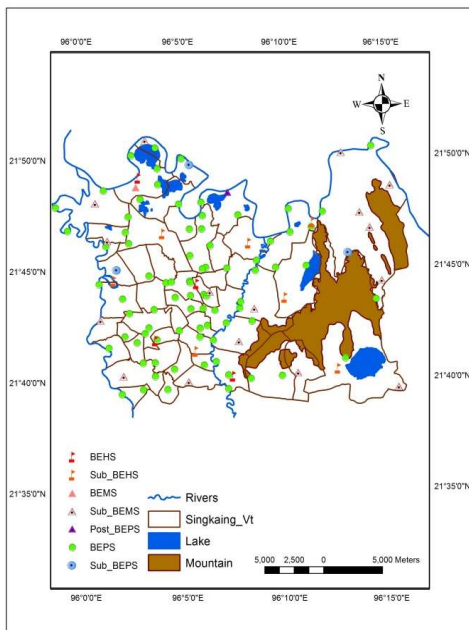
Source: Township Education Office, Singaing

**Spatial Analysis**

In 2016, there are 112 study points (schools) in Singaing Township. The respective distances among primary, middle and high schools were analyzed. Generally, the students will choose the nearest school to attend for the next level. The distribution of basic education schools in Singaing Township is shown in Map (4).

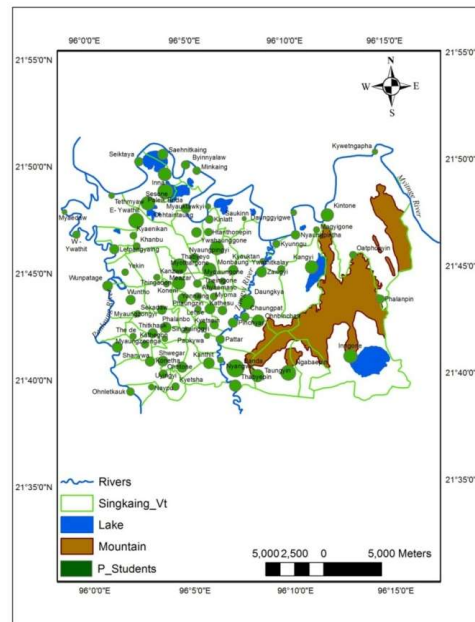
Firstly, basic education primary schools were studied. The study area is mainly composed of rural areas and primary level students can walk about one mile distance only. So one mile radius buffer zones are the most convenient roughly for the present study. Therefore, one mile buffer zones were formed based on all schools. From this study, 10 areas were distinctively emerged out of these buffer zones, including Chanthargone village (Sisone village tract), Amatgyigone village (Kanswe village tract), Seikpyoye village (Mithweboke village tract) and the remaining are uninhibited agricultural areas and mountain ranges (Map 8).

Map (5). Spatial Distribution of Basic Education Schools in Singaing Township



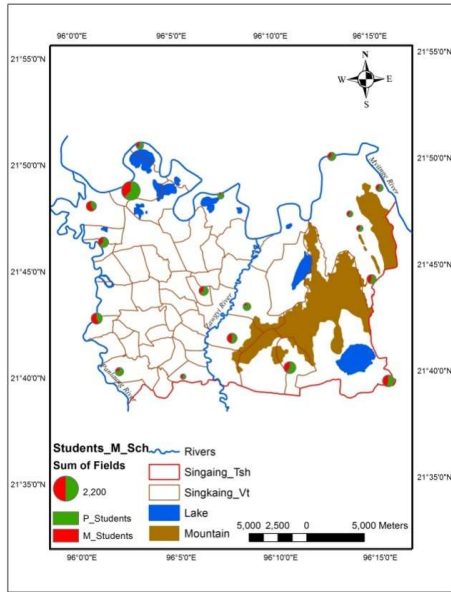
Source: Field survey data

Map (6). Student Population of Primary Schools in Singaing Township

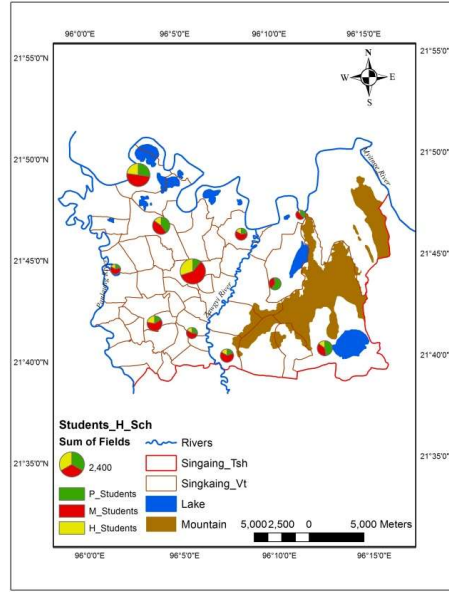


Source: Township Education Office, Singaing

Map (7). Student Population (with their respective grade) of Middle Schools in Singaing Township

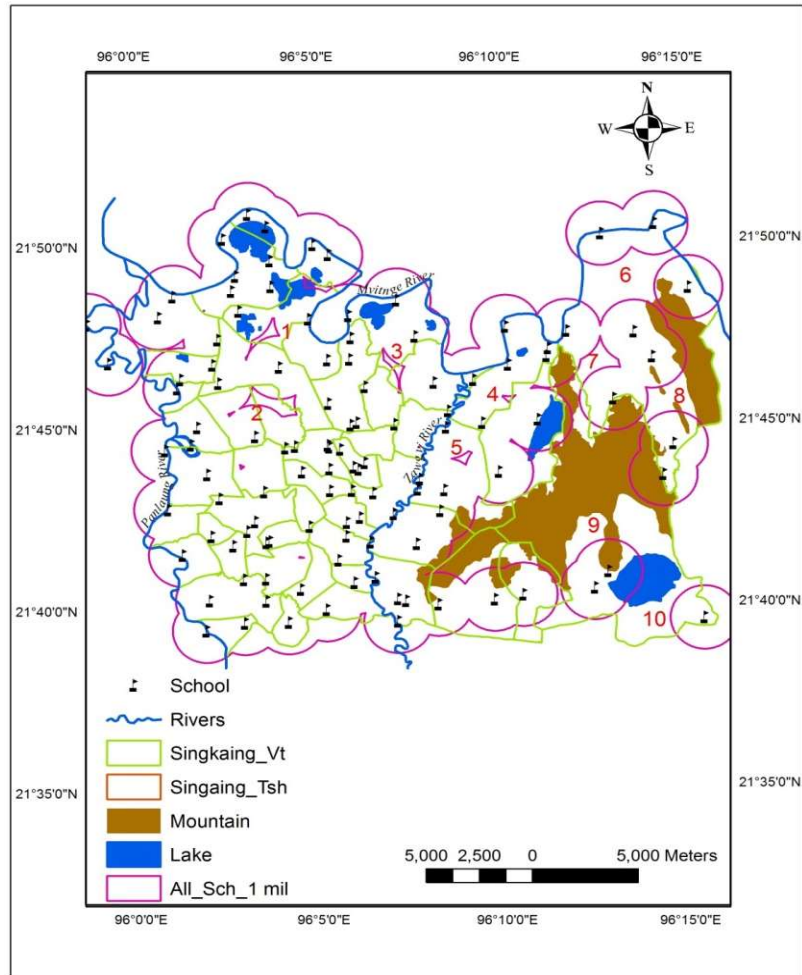


Map (8). Student Population (with their respective grade) of High Schools in Singaing Township



Source: Township Education Office, Singaing

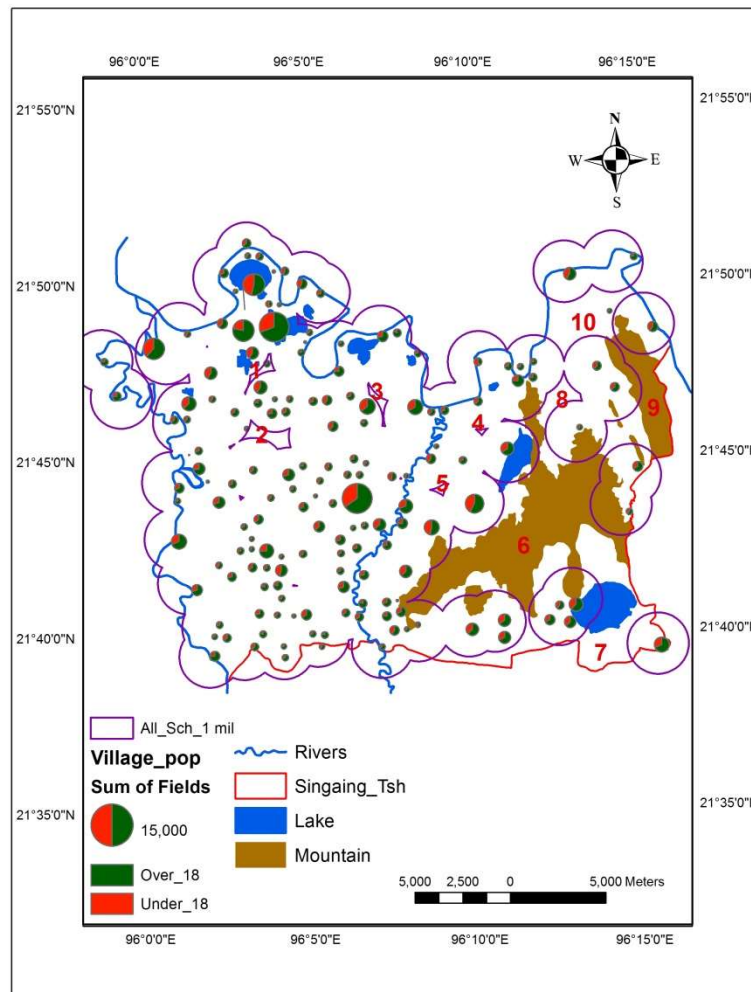
Map(9). New sites for Primary School



**Source:** compiled by researcher

For this reason, these localities are the most suitable areas to establish and open new primary schools, where 363 people live in Chanthargone village, 224 people in Amatgyigone village and 203 people in Seikpyoye village. The school-age children (under 18 years) of these villages amounts to 91 people, 71 people and 57 people respectively (Map 10).

Map(10). New Sites for Primary School and Total Population of each Village in Singaing Township

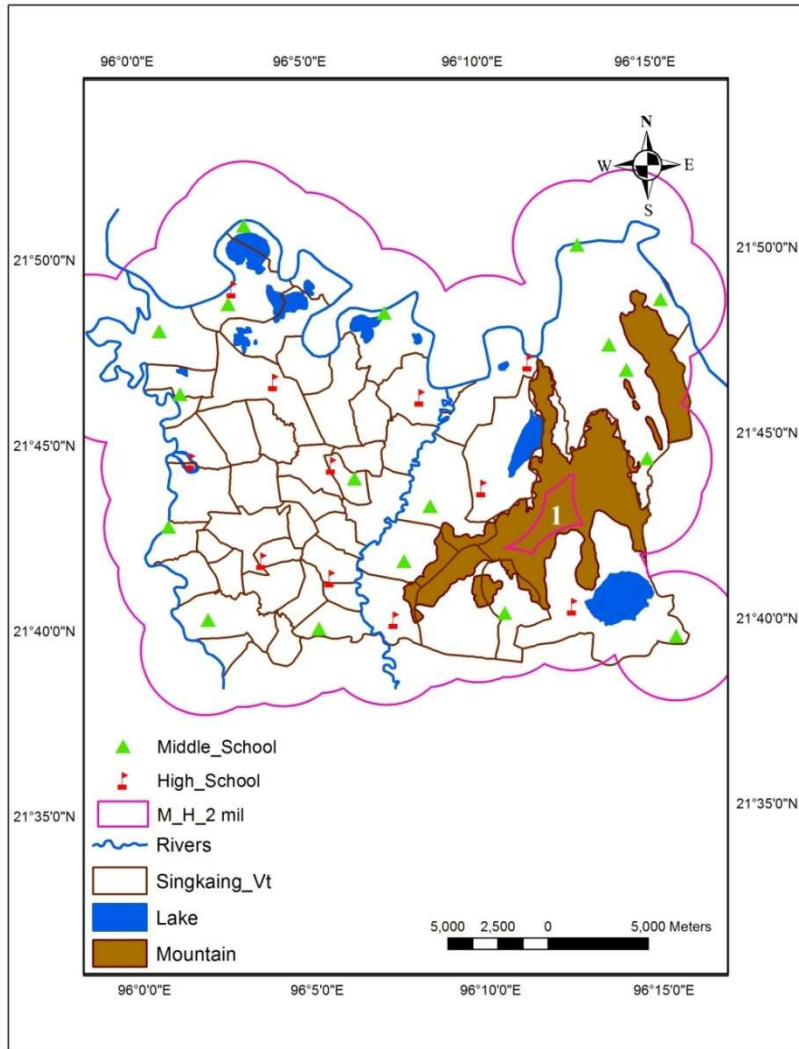


Source: compiled by researcher based on Table (2) and Map (9)

In the second phase of the study, localities of the middle schools were analyzed. As most of the middle school students have to go to their schools by bicycles, their travelling capacities to go to school are 2 or 3 miles. Therefore, the buffer zones were established as a radius of 2 miles. In this case, there is only one area outside of these zones. However, it is located on the Keinnayar

Range and it can be considered that the middle school is sufficient for the whole township (Map 11).

Map (11).Location to be needed to upgrade to Middle school



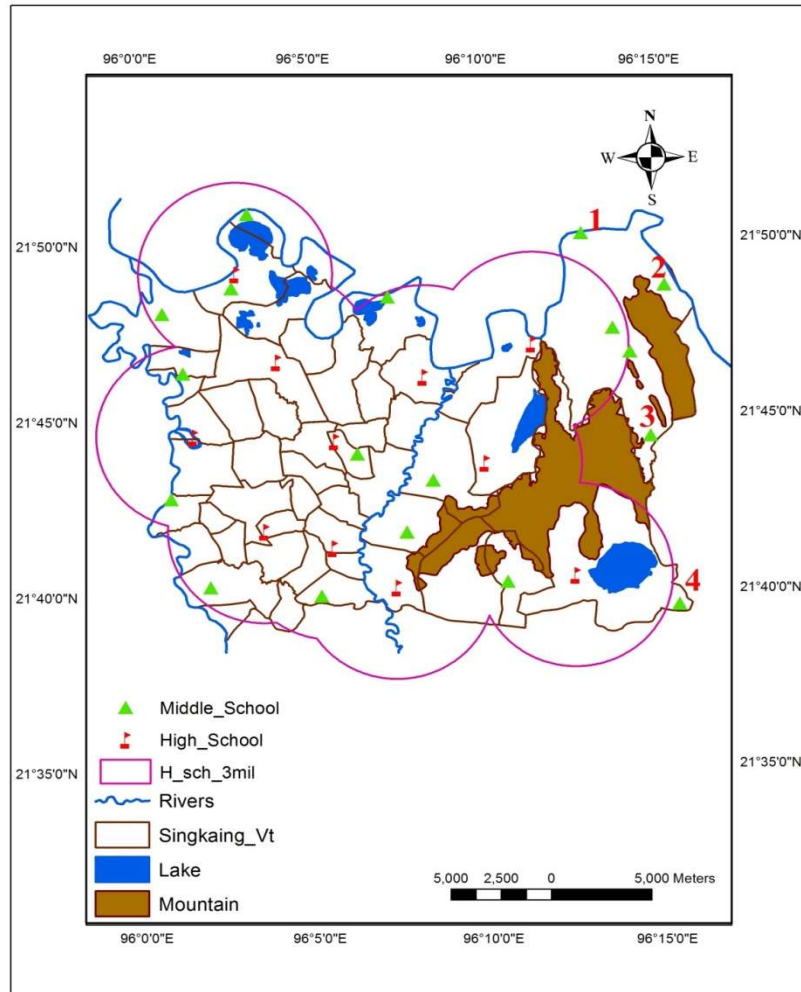
Source: compiled by researcher

Finally, the need for the locations of the State High Schools is examined. In this case, 3 miles radius buffer zones are established. By the examination of 3 miles buffer zones, the localities lying outside the range of the distance to travel to the school were found to be the middle school of Mithweboke, Ywathaya, Natyekan and Kado village tracts (Map 12).

In the first two village tracts of Mithweboke and Ywathaya, the students from these State Middle Schools have to go to Ywabo BEHS for their high school education. By comparison, the student numbers of both schools are nearly the same. However, the students from Ywathaya BEMS have to take a length of their route to go Ywabo BEHS because the route around the mountains has to be taken. Therefore, it can be considered that Ywathaya BEMS is more suitable site than Mithweboke BEMS to be upgraded into the State High School.

In the last two village tracts, the students from Natyekan and Kado State Middle Schools have to go to Sunye State High School for their next level education. By comparison, Kado and Natyekan State Middle Schools are nearly away from BEHS Sunye. However, the Dattaw Hill is between BEMS Natyekan and BEHS Sunye as a physical barrier. Therefore, it can be assumed that the BEMS Natyekan is the most suitable site to be upgraded from BEMS to BEHS in spite of having lower student population than BEMS Kado.

Map(12). Location of Middle Schools (to be needed to upgrade to High school)



Source: compiled by researcher

### Findings and suggestions

In studying Basic Education Schools in Singaing Township, three groups can be analyzed such as Basic Education Primary Schools (BEPS), Basic Education Middle Schools (BEMS), and Basic Education High Schools (BEHS).



In examining the first group of Basic Education Primary Schools (BEPS), 10 areas were distinctively emerged out of one mile buffer zones including three villages and the remaining are uninhabited agricultural areas and mountain ranges. For this reason, these three villages (Chanthargone, Amatgyigone, Seikpyoye) are the most suitable areas to establish and open new primary schools.

In studying the second group of Basic Education Middle Schools (BEMS), there is only one area outside of two-mile buffer zones. However, it is on the Keinnayar Range and thus it can be considered that the middle school is sufficient for the whole township.

In analyzing the third group of Basic Education High Schools (BEHS), four middle schools (Mithweboke, Ywathaya, Natyekan and Kado) were found outside the range of three-mile buffer zones. Among these four schools, Basic Education Middle Schools in Ywathaya and Natyekan are needed to be upgraded into Basic Education High Schools because of their physical barriers.

### **Conclusion**

Education is a basic human need. Only when people are well educated and skillful in modern technologies, they can gain their life struggle for food, clothing and shelter. This paper intends to analyze the condition of Basic Education Schools in Singaing Township. In this study of Basic Education Schools, three groups can be analyzed such as Basic Education Primary Schools (BEPS), Basic Education Middle Schools (BEMS), and Basic Education High Schools (BEHS).

In (2016-17) Academic Year, four high schools (BEHS), seven branch (affiliated) high schools (Sub BEHS), one middle school (BEMS), sixteen branch middle schools (Sub BEMS), one post primary school (Post BEPS), eighty primary schools (BEPS) and three branch primary schools (Sub BEPS) totally with 22,927 students. There are totally 112 government basic education schools and 4 private schools. The total numbers of students at these private schools were 2017 in this Academic Year.

Based on the data being collected from both primary and secondary sources, the processing and analytical patterns are conducted by means of GIS Techniques. Spatial distribution pattern of education school is analyzed by using

In examining the first group of Basic Education Primary Schools (BEPS), it is found that the three villages such as Chanthargone, Amatgyigone, Seikpyoye are the most suitable areas to establish and open new primary schools.

In studying the second group of Basic Education Middle Schools (BEMS), there is only one area which is on the Keinnayar Range to establish and upgrade to the new middle school. Therefore, it can be considered that the middle school is sufficient for the whole township.

In analyzing the third group of Basic Education High Schools (BEHS) such as the four middle schools of Mithweboke, Ywathaya, Natyekan and Kado were found outside the range of three-mile buffer zones. Among them, Basic Education Middle Schools in Ywathaya and Natyekan are more needed to upgrade into the next level because of physical barriers in those areas.

### Acknowledgement

First and foremost, I would like to pay my deep respects to my parents, who give birth and look after with great kindness to me. I am greatly indebted to all my teachers from my schooling age to the present for their teachings, proper guidance and instruction in my life. Secondly, I would like to express my special thanks to Dr Win Min Thein, Professor and Head, Department of Geography, Kyaukse University, for her permission to submit this research paper. Finally, my deep thanks and gratitude are due to the personnel who were concerned at the various governmental offices of Singaing Township for their allowances to collect and use their official data.

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