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Mathesis On: The Spatial Distribution Of Primary Schools And Effect On þÿ S t u d e n t s A c a d e m i c P e r f o r m a r Case Of Damboyaworeda Kembata Tembaro Zone In Snnpr Of Ethiopia

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MATHESIS ON: THE SPATIAL DISTRIBUTION OF PRIMARY SCHOOLS AND EFFECT ON STUDENTS' ACADEMIC PERFORMANCE: THE CASE OF DAMBOYAWOREDA KEMBATA TEMBARO ZONE IN SNNPR OF ETHIOPIA

BY

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I herby certify that I have read and evaluated this thesis prepared under my guidance, by Alemu Abuto Thesis entitled "The spatial distribution of schools and its effects on students academic performance": The case of Damboya Woreda Kembata Tembaro Zone SNNPR of Ethiopia. I recommend that it to be accepted as fulfilling the thesis requirement for the degree of Master of Arts in Geography and Environmental studies.

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Declaration

I, Alemu Abuto declare that this Thesis entitled The Spatial Distribution of primary Schools spatial accessibility to students and its effect on students' academic performance: The case of DamboyaWoreda, SNNP of Ethiopia on partial fulfillment of the requirements for the award of the degree of Master in Geography and humanities is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

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Acronyms and Abbreviations

CSA	Central Statistical Authority
CERC	Comparative Education Research Centre
EPRDF	Ethiopian People's Revolutionary Democratic Front
ESDP	Education Sector Development Program
ESR	Education Sector Review
GDP	Gross Domestic Product
GPS	Geographical Positioning System
HICs	High Income Countries
ICESCR	International Covenant on Economic, Social and Cultural Right
LICs	Low Income Countries
LQ	Location Quotient
MDG	Millennium Development Goal
MOE	Ministry of Education
OECD	Organization for Economic Co-operation and Development
SES	Socio Economic Status
SNNPR	Southern, Nation, Nationalities and Peoples Region
UNESCO	United Nations Educational Scientific and Cultural Organization
UNICEF	United Nations International Children's Emergency Fund
UNB	Universal Serial Bus
WDE	World Data on Education
WB	World Bank
SNNPR	Southern, Nation, Nationalities and Peoples Region

Abstract

The study assessed the spatial distribution of primary schools, the spatial accessibility of primary schools to the students and the effects of spatial distribution on students' academic Performance in Damboya Woreda, Kembata Tembaro Zone, SNNPR of Ethiopia. The study involved three specific objectives; the 1st objective was to evaluate the spatial distribution of primary schools in terms of population number in Damboya Woreda. The 2nd objective was to measure the spatial accessibility of primary schools to students in the study area and the 3rd objective was to analyze the effects of spatial distribution of primary schools on students' academic performance. Quantitative approach and descriptive survey design were employed. The data used for this study were primary and secondary. Primary data were collected using a hand-held GPS receiver. It is used to capture the coordinate points of the primary schools and other relevant data during filed survey. Secondary data included in the study were administrative map of the study area, Orthophoto of the woreda, Ethio-map, Ethio-Kebeles, population figures of each Kebeles, students' list and their result, name and location of primary schools of the study area. All Kebeles and all primary schools are incorporated in the study. Data analysis was carried out by using different types of statistical techniques such as Location Quotient (LQ), Lorenz Curve (LC), ratio of school to population, percentage. Bar graph and tables were used to present the data .The findings of the study indicated that the population and schools are not evenly distributed. This revealed that the existing of gaps in access to primary schools in the study area. LQ value varies from4.9 to 0.3; LC indicated that about 37% of primary schools are enjoyed by about 49.6% of population and the remaining 57% of the primary schools are enjoined by 51.4% of the population. Ratio of schools/population varies from 1: 14827 to 1: 1009. About 64.8% of students travel above 2kms to access the schools, while only 35.2% of students travel below 2kms to access the school. Students those who travel above 2kms to access the school constitute 81.7% of dropouts of students from the school and 86% of the students scored below 50% are those who travel above 2kms to access the school. The study concluded that the spatial distribution of the primary schools was not considering population number in the study area. This leads to inaccessibility of schools to students. Hence large numbers of students were forced to travel above 2kms to access the schools. This resulted in dropout of students from the schools and minimization of their results. Finally the study recommended that there was a need for intervention of planners and government in the provision of primary schools in deficient Kebeles such as Bonga, Dato-Darabora,Hego, Qoxa-Kombola, Hamancho, Geremba, Hanja-Laloamo, Yebu and Gonjii.

Keywords: Spatial distribution, accessibility, academic performance, Location Quotient, Lorenz curve.

INTRODUCTION

1.1 Background of the study

Education together is a human right in itself and crucial means of realizing other human rights, principal vehicle by which economically and communally marginalized adults and children can pick up them out poorness, attain the means partake fully in their communities, empowering women, defending children from misuses and dangerous labour and sexual misuse, promoting human rights and democracy, defending the surroundings and overgrowth of population. Ever more education is accepted as one of the top economic asset. A well educated individuals and active mind, capable to wander liberally and widely, is one of the joys and benefits of human survival (ICESCR, 1999 article 13a). Education is universal, inalienable, and indivisible basic human rights used to reduce poverty, drives sustainable economic growth, defending disparity, and unfairness, leads to improved health; mainly women and children and it helps to protect the planet, empowers child and adolescents (ICESCR, 1999 article 13). But the financial and communal profit of education depends on generating learning outcomes, and not immediately receiving children into school.

Education problems are greater in Low Income Countries(LICS) and Middle Income Countries (MICs), but even in upper-middle- income countries (UMICs), and HICs, where access is worldwide or approximately universal, major problems stay in terms of learning and impartiality (UNICEF, 2019:12). Educational institutions and programs have to be reachable to each person, with no favoritism, in the power of the state party (ICESCR, 1999 article 13:3).

For human and financial advancement of the world; quality, impartial, accessible and satisfactory spatial distribution of schools is too important. But until presently spatial disparity and deficiency of schools are the major issues of developing countries of the world (Wazzan, 2017: 71).

With respect to fairness, access to education and learning remains extremely not uniform, together with in many middle and high- income countries important compounding dissimilarities exist in access and learning in relation to capital, place, sex and unfairness of education asset (UNICEF ,2019:15). Education is a strong instrument for fighting poorness, financial disparity and sexual orientation imbalance in wages, reproductive autonomy and political power control

and provides decent work and bringing closer together (OXFAM, 2019:8-18). But lack of success in education; forces high costs on society. Ineffectively educated individuals restrain economies, capacity to create, develop and improve, damage social cohesion and mobility and force extra costs on public budget to bargain on open wellbeing and social bolster and more note worthy guiltiness (OECD, 2012:5-6).The general objectives of education is to produce productive, responsible, democratic, creative, independent, honest, industrious and accountable citizens; however inaccessibility and low quality, an inequitable distribution of educational opportunities, inefficient administration and shortage of financing hinder the objectives of education in Ethiopia (World Data on Education, 2006/07:1-3).

All children have the right to go to school and learn, regardless of who they are. However location of schools keeps children from school .School distance is a major factor in preventing children from enrolling in primary school or causing them to dropout (UNICEF, 2018). Children face severe harms to go to school in the rainy times as the way turn into muddy and make walking to and from school extremely hard at times children walk one or two kilometers each morning to reach to schools (MoE, 2018-2030: 10). Distance of schools affects students, especially those who are living far away from schools. Some of the challenges that faced students due to location of schools include absenteeism, decrease their academic achievement, poor attendance, early marriage, pregnancies, negative attitudes toward schools, variability of learning resources and drop out of students from the school (Joseph, 2015:50-61).

Lack of access of schools excludes children from schools (Sifuna&Sawamura, 2010: 8).In terms of the expansion of the elementary school, many African countries that are generally considered to the poor. Even by African standards, in terms of expansion of educational opportunity, Ethiopia had extremely lagged behind. Taking into consideration the physical and population size of the country, it was not only that the number of schools were inadequate but were also accumulated mostly in urban areas. As a result the large number of population had no access to education. Limited expansion of the school system was not the only problem of the educational system in Ethiopia but also the pattern of schools is not uniform and its accessibility was also inequitable, huge gaps existed between regions, zones, *woredas, kebeles* and above all between urban center and rural areas(MoE, 2002: 11-14).

Distance is the burden to the students from far area and when they reach at school are tired enough in such a way that is difficult for them to gain in the class, when walking for long distance they become hungry and when they enter in the class are not ready to learn because of tiredness (Joseph2015:52). Distance from home to school is a major deterrent factor to enrollment or regular attendance. Transport in rural areas is often poor, rural children tend to enter school around age of 7 or as late as age of 9,as they must be strong enough to walk the distance. However, by the time they are old enough to earn income or strong enough to assist in the farm, they begin dropping out from the school. There is an included concern for ladies in their adolescence, insecurity on the street to school hinders enrollment (CERC, 2008:119). Hence provision of accessible educational services is the foremost step to achieve sustainability in national development and living condition in the area, as it can directly affect quality of life targeted population (Fabiyi & Ogunyemi, 2015).

In this study the spatial distribution of primary schools in terms of population number, spatial accessibility of primary schools to students and effects of spatial distribution of primary schools on students' academic performance was assessed in *Damboya woreda, KembataTembaro Zone, SNNPR* of Ethiopia.

1.2 Statement of the problem

Equitable, accessible and fair spatial distribution of schools without discrimination by considering all citizens at rural and urban level is very important to create productive, democratic and self-reliant citizens, to overcome the problems which faced on the quality of education, the problems of the society and to ensure Millennium Development Goal (MDG). (Leta, 2018) conducted a study on analysis of spatial distribution and accessibility of primary and secondary schools in Bishoftu town. His study emphasized on spatial concentration, spatial pattern and spatial accessibility of schools and factors affecting spatial distribution pattern. Similar study conducted by (Abraha, 2019) on analyzing spatial and non- spatial factors affecting educational quality of primary schools in Gambela city. His study was centered on low teachers qualification, low teachers motivation, constrained teachers building capacity, incapable school administration, less involvement of parents, lack of enough school facilities, overcrowded classes, low quality, high pupil teacher ratio, and lack of instructional materials.

Tagel et.al (2017) conducted research on assessment of school spatial distribution in Debre Markos town. All these studies were not showing the effects of spatial distribution of schools on students' academic performance. In the case of *Damboya Woreda, KembataTembaro Zone, SNNPR* of Ethiopia spatial distribution of primary schools, the accessibility to students and effects of spatial distribution of schools on students' academic performance as far as the researcher knowledge concerned there is no research or not accessed by the researcher. Therefore, the researcher initiated to fill the gap, conducted a research on spatial distribution of primary schools, spatial accessibility to the students and effects of spatial distribution of primary schools on students academic performance in *Damboya Woreda, KembataTembaro zone,* SNNPR of Ethiopia.

1.3 Objectives of the study

1.3.1 General objective of the study

The general objective of the study was to assess the spatial distribution of schools and effects on students' academic Performance in the study area

1.3.2 Specific objectives of the study

The specific objectives of the study were:-

- ✓ To evaluate the spatial distribution of primary schools in terms of population number
- ✓ To measure the spatial accessibility of schools to students in the study area.
- ✓ To analyze the effects of spatial distribution of schools on students' academic Performance

1.4 Research questions

- Is the spatial distribution of primary schools considers population number in the study area?
- To what extent the primary schools are accessible to students in the study area?
- What are the effects of spatial distribution of primary schools on students' academic performance?

1.5 Significance of the study

The findings of this study highlight the current status of spatial distribution of primary schools in terms of population number, the spatial accessibility of primary schools to the students and effects of spatial distribution of primary schools on students' academic performance in the study area. Additionally, the study provides realistic information to stakeholders in order to create awareness in relation to service provision and it serve as corner stone for those who want to conduct other studies on similar topics.

1.7 Scope of the study

This study focused on the spatial distribution of primary schools, accessibility of schools to the students and effects of spatial distribution of primary schools on students' academic performance in *Damboya Woreda, Kembata Tembaro Zone, and* SNNPR Ethiopia. The review of literature focused on the History of Ethiopian education, spatial distribution of primary schools, and spatial accessibility of primary schools to the students and effects of spatial distribution of primary schools on students' academic performance. The approaches used for the study was quantitative approach and the research design was descriptive survey. Primary and secondary data were used for the study. The statistical tools used in this study include location quotient, Lorenz curb, and ratio of schools to population, percentage. Tables and graphs were used to present the data. Materials used for this study were GPS, GIS, Orthophoto of the study area, Ethio- map & Ethio-*Kebeles*. All primary schools (30) existed in (20 *Kebeles*) included in the study.

1.6 Limitation of the study

Some of the limitations faced the researcher during conducting the research include lack of previous research studies on similar topic, limited access to internet, transportation, limited number of GPS, the access of electricity, time constraints and shortage of budget. However, the researcher by overcoming these limitations conducted a research.

1.8 Organization of the Thesis

This thesis paper has five chapters. The first chapter consist background of the study, statement, objectives, research question, significance of the study, limitation of the study and scope. The second chapter includes review of related literature. The third chapter is research method and materials which include description of the study area, research approaches, research design, sampling technique, source of data and data analysis technique. The fourth chapter is results& discussion. The 5^{th} chapter consist summery, conclusion and recommendation.

1.9. Operational definition of terms

Spatial distribution- it refers the geographical distribution of schools among each *Kebeles* in the study area.

Accessibility- is the degree to which schools are available to as many people as possible. It can be viewed as the school is accessible if the students cannot travel at most 2km from their home (maximum acceptable distance of UNESCO standard).When children are afforded the opportunity to acquire education, schooling service without any obstacles, like with short distance(less than 2 km), it is said to be accessible otherwise it cannot be accessible (Ogunyemi et al 2014: 12).

Pattern-: it refers a particular way in which the spatial distribution of schools is usually or repeatedly done among each *Kebeles* in the study area. When studying spatial distribution of schools, three basic patterns expect to find namely uniform pattern, random pattern& clustered or clumped (Abbas et al., 2017:156-158).

CHAPTER TWO

2 REVIEW OF RELATED LITERATURE

2.1 The history of education in Ethiopia

Education in Ethiopia has been dominated by Ethiopian Orthodox Church for many centuries until secular education was adopted in the early 1900s. Toward the end of the 1900thc, Menelik ll had also permitted the establishment of European missionary schools. At the similar time, Islamic schools supplied some education for a small part of the Muslim people. Following their invasion of Ethiopia, the Italians acted rapidly to rearrange the educational structure in Ethiopia. A law issued, in 1936 repeated the guideline that the recently subjugated country, as in the older colonies, would have two different types of educational institutions, specifically "Italian- sort of schools" and schools for "colonial subjects". After the Italian vanquished, the country begun to construct up the sector, but the system faced the problem. Beneath the Derg administration, Marxist- Leninist philosophy was the directing theme for all government frameworks. One of the 1st policy changes was the right of every citizen to free primary education. After the ousted of the Derg regime by Ethiopian Peoples' Revolutionary Democratic Front (EPRDF), the EPRDF had step by step improved the educational sector leading up to the current system (Alemayehu, 2012).

2.1.1 Principles of Ethiopian education

The cardinal standards which form the basis for the provision of educational institutions were:- decentralization of the management of education; people/ community involvement; impartial dispersion of educational services and improvement of local culture and language. The general goals of education were:- to create the physical and mental potential and the issue tackling capacity of people by growing fundamental education for all; to bring up citizens who can beware of assets; to bring up citizens who regard human rights, stand for the well-being of individuals as well as for balance, equity and peace, endowed with democratic culture and discipline; to bring up citizens who separate harmful practices from valuable one, who wish and stand for truth and appear a positive character towards the advancement and dispersal of science and technology in society; to develop the cognitive, imaginative, creative and profitable citizens (WDE,2006/07:1-6).

2.1.2 Problems of Education systems of Ethiopia

The main problem of Ethiopian Education system were limited and inequitable access, lack of quality and relevance, continuous decline in quality and standard, inefficient administration and lack of adequate financing. The 1st five year Education Sector Development Program (ESDP, 1997/98 – 2001/002) was launched in 1997 and concluded in2002 against this background. The objectives of ESDP were; increase general educational attainment of the people and to lay the base for accomplishing entire education by the year 2015, extended access to education with special emphasis on primary education in rural areas, improve equity, improve quality and improve financing of education(MoE, 2002:10-20).

2.2 The Role of Education in National Development

Education has been portrayed as "the Great Equalizer" because of its transformative power. It helps to avoid the highest capital imbalance and deep-seated indigence; guarantee financial development is more broadly shared by acting as a redistributive instrument and lead to more even handed economies. In this way education can act as a leveler and equalizer within the society, closing the differences between wealth and poor and ladies and men. However the opposite can also be true an exceedingly unequal education framework can drag us further apart. Usually since an education framework that is itself profoundly unequal will contribute towards more unequal societies by hardening pre-existing disparities and constraining social mobility. It is not sufficient to only focus on improving quality; we must too endeavor to equalize opportunity within education. Government must center on the extraordinary disparity in education. Destitute children do systematically more regrettable than their wealthier peers, dropping out prior, and young ladies confront serious separation. Making education more equal implies progressing access to education for all (OXFAM, 2019:16-32).

Education plays an imperative part within the life of citizen and the country at huge. Burtch(2006) alluded to it as a major drive in economic, mental, social and cultural strengthens. Its value in bringing almost character and attitudinal alters positions as important as its capacity to reshape human possibilities for desired advancement. UNESCO(2012), detailed that the development of education is fundamental to the improvement of economy around the world. World Bank opined that the Gross Domestic Product (GDP) of a country will increase 3% yearly as the level of education increments. Education is a fundamental human right, and is a

vital for the accomplishment of other human rights. Education contributes to each country by building the economy, therefore minimizing poverty rate. It moreover enlightens the people, in this manner making the citizens to tolerate with the standards of the society. Education cultivates and upgrades work abilities and life skills such as an instrument of development. Those person abilities advance societal- level financial development through expanded productivity and potentially better administration (Orji2013:1). World Bank(2017), suggests that there should be continued expansion and improvement in both Ethiopia is among countries that concur to education as an undoubted means of fulfilling national development, thereby making private persons, administration and organizations to lay down educational institution at every stage to fit educational need and wishes of the society; even though the prospect for equivalent distributions of educational infrastructure is a major challenge. It is quite obvious that the objective of developing the entire citizenry cannot be achieved unless the public education facilities are evenly distributed over the country's landscape taking into consideration, the local population density and land area coverage per school. Primary and secondary education prepares students for different career options in the growing economy.

2.3 Pattern of spatial distribution of schools

Mustapha et al. (2016) conductd a research on spatial distribution of primary schools in Iiorin west local government areas, Kwara state, Nigeria. Primary and secondary sources used as instruments of data collection and used average nearest neighbor analysis in determining the pattern of spatial distribution of schools. The study showed that the distribution of primary and secondary schools are clustered. It shows the pattern of spatial distribution of schools among the different wards differently. Other study conducted by Fabiyi and Ogunyemi (2015) in Nigeria, indicated that the pattern of spatial distribution of schools is dispersed pattern. However a clustered pattern was obtained for nine electoral wards while a dispersed pattern was obtained in Iiaro ward relatively urban ward. The study used primary data through questionnaire and GPS. According to study conducted in Kirfi local area, Bauchi, state, Nigeria by (Abas et al. 2017), the pattern of spatial distribution of school was clustered manner. The study used both qualitative and quantitative approaches as well as descriptive cross sectional survey. The study of (Leta 2018) showed inequality of spatial distribution of schools and clustered pattern of schools in Bishoftu town.

2.4 Accessibility of schools to students

According to the study of (Ogunyemi et al., 2014:13-20) spatial distribution of schools in Nigeria is not accessible to students. Therefore students travel above 2kms to their schools. A study conducted by (Fabiyi and Ogunyemi, 2015) south western of Nigeria indicated unequal distribution of schools and disproportionate spatial distance of students to school especially in the rural areas. Some students travel as much as 5kms mostly on foot to school every day. Similar study conducted by (Al-zeer,2005) in Saudi Arabia, showed a shortage of schools in the north wards of the city, and overcrowding of schools in the south wards of the city. About 89% of schools are located less than 2kms far away than other schools and 11% are schools far away more than 2kms than other schools. The study conducted by (Joseph 2015:50-51) in Tanzania indicated that distance of schools affects students, especially those who are living far away from schools. Some of the challenges that faced students due to location of schools include absenteeism and poor attendance, decrease their academic achievement, negative attitudes toward schools and drop out from schools. Similar study conducted by Johannes (2014:73) in Tanzania, showed that transportation problems affect students attendance.

2.5 Spatial distribution of schools in terms of population number

Research conducted in Syria by (Wazzan, 2017), showed that population and schools are not equally distributed. This indicated that the existing of gap in access to schools between wards with some wards experiencing overcrowding of schools, while other suffering lack and have no access to schools. The study used secondary data. The distribution of school is not considering population number in Saudi Arabia (Al-zeer, 2005). Similar study conducted by (Yi, 2004:12) in Yuhua, Changsha, China showed that peoples living near to city centre and peoples living on the periphery not equally benefited.

2.6 Factors influencing students' academic performance

Various studies and research have been done by different researchers and institutions looking on the factors that influence students' academic performances. According to the researchers there are many factors that influence students' academic performance in public primary schools, something which makes differences among students' performance starting from individual level, local, regional, national and global wise in their educational performance (Farooq et al., 2011).

Studies about students academic achievement concludes that the quality of the physical environment altogether influence learners' accomplishment (Crosnoe, Johnson and Elder, 2004). Earthman (2004) showed that there is adequate studies stated without equivocation that the buildings in which learners spend a good deal of their time learning does in fact affect how well they learn. Other researcher contends that the environment and the individual characteristics of learners play a significant role on their academic achievement. In addition, Class sizes have been identified as causal factor of educational achievement. Studies have showed that schools with lesser class sizes achieve academically better than that of schools with bigger class sizes. Kraft (1994) in his study of ideal class size and its effects on effective teaching and learning in Ghana concluded that class sizes above 40 have negative effect on students' achievements. Asiedu-Acrofi (1978) indicated that since children have differences in motivation, interests and abilities and those they also differ in health personal and social adjustment and creativity. Generally, good quality teaching is best done in classes with smaller numbers that permit for person's concentration.

Parental education and family socioeconomic status (SES) have positive relationships with the students' quality of accomplishment (Jeynes, 2002; Parelius, 1987; Mitchell and Collom, 2001). The students with high level of SES perform better than the students with low level of SES (Kahlenberg, 2006; Kirkup, 2008).

The theory of educational productivity by (Walberg, 1981) determined three groups with nine factors based on affective, cognitive and behavioral skills for optimization of learning that affect the quality of academic achievement. Aptitude (Skill, development and inspiration); instruction (quantity and quality); surroundings (home, classroom, peers and television) (Robert ,2007).Other researchers show environmental factors such as peer, family, school, religion and other factors that encourage or discourage students' academic performance. Diaz A.L (2008) explain that academic failure do begin with the three elements that intervene in education, that is; parents (family causal factors), teachers (academic causal factors), and students (personal causal factors).

Generally, these factors include ages, gender, geographical belongingness, ethnicity, marital status, socioeconomic status, parents' education level, parental profession, language, income and

religious affiliations. Crosnoe et.al,(2004) these factors' may be combined as student' factors', family factors', school factors' and peer factors.

The individual characteristics of learners play an important role in their academic achievement (Farooq et al., 2011). In line of students' factors, the health status of the children can be another factor that can influence the academic performance of the students. Adewale (2002) had detailed that in rural community where nutritional status is relatively low and health problems are prevalent, children academic performance is greatly hindered. Additionally, (Eze,2002) had contended that when a child get appropriate nutrition, health care, stimulation during pre-school years, the ability to interact with take optimal advantage of the full complement of resources obtained by every official learning environment is improved.

When school works close to families to back learning, children tend to succeed not reasonable in schools but all through life (Adewumi et.al, 2012). The accomplishment of students is negatively or positively connected with level of parents' participation in school activities because it affects the individuals in acquiring accessibility to sources and materials of learning (Eamon, 2005).Lack of the parents to meet these specific needs can have wide-ranging and long-lasting negative consequences to students' academic accomplishment. Greater potential involvement at early stage children's learning positively affects the children's school performance including higher academic achievement (Rouse and Barrow,2006).

Krashen (2005) indicated that learners whose parents are educated do higher score on standardized tests than learners whose parents' were not sophisticated. Educated parents can better communicate with their children concerning the school work, activities and the information being thought at school. They can better assist their children in their work and participate at school (Fantuzzo and Tighe, 2000). The academic performance of students heavily depends upon the parental participation in their academic activities to attain the higher level of quality in academic performance (Barnard, 2004).

Singh et al (1995) distinguished four components of parental participation in school to be specific; parental desire for children's education, parent-child communication almost school, home structure and parental support in school related activities. Failure of the parents to do these; resulted into high rate of failure of students in academic achievement in the school. School itself

incorporates a big role in impacting the learners' academic accomplishment. In most school found especially in rural and farther areas are in danger in academic achievement, such a way that most of them ending with failure. As it stated in (Lippman,2010) that the environment shapes the students and that students impact their environment within the education attainment. School must make spaces that learners want to go to, comparable to the way cafes attract people instead of the space being purely functional (Bunting, 2004). The school personnel, members of the families and communities give assistance to students for the quality of their academic achievement. This social help contains a pivotal role for the achievement of success goals of learners' at school (Goddard, 2003).

Other investigate has recognized that learners accomplishment slacks behind in miserable school buildings compared to those prepared with fancy classrooms, swimming pools, television studios and the like (Higgins et al., 2005).School culture too contributes to the students' achievements. School culture refers to a set of standards and ways of working, considering, talking, esteeming and behaving. When the background of the school reflects the mores of the home or community, the classroom is more common to children. When school reflects different ways thinking, knowing and valuing, children must cross boundaries, making the learning process more complex (Crosnoe et al., 2004).

According to (Castrogiovanni, 2002) per group is defined as a small group of similar aged, fairly close friends, sharing the same activities. Howard (2004) contends that peer impact can have both positive and negative outcomes on learners' academic achievement and socialization. It is also expected that similar groups may not permit a teenager to be "themselves" in the truest sense of the word. The peer group gives potent feedback by their words and actions, which either encourage or discourage certain behaviors and attitudes to their fellow. For that case they may influence negatively or positively in academic performance in school.

2.7 Roles of geographical location of schools in students' academic performances

Literature review indicated that geographical location of schools has more prominent impact in learners' academic achievement. According to (Walter, 1998) one of the factors that affect students' academic success is school location/ site of the school. In connection to this

(Onokerhoraye,1995) indicated that shortage of favorable school location has contributed to the imbalances of western education from one part of the country to the other. Mbakwe(1986) inform that education authorities of various states have to be decide where a particular type of school should be located; the size of a school in each location. Walters (1998) insist that high school students' level of performance is with statistically linked with school location. Worldwide the issue of geographical location of schools has been discussed indicating its influences to students' academic achievement. A World Bank guide line (1978) indicates that school location planning techniques have been reportedly used by a number of countries to solve their educational problems. Ogunsaju (1984) noted that school sites in the past where arbitrary chosen with little or no consideration for the necessary parameters such as creativity and corporate planning. Ojoawo (1989) found that location of school is one of the potent factors that influence the distribution of educational resources.

Other impacts of location of school to students include; absenteeism, dropout rates and early pregnancies. Amitava et al (2010) contend that location of school affects performances of students which results into poor attendance, resulting in low achievements, increases dropout rate and amplifies a host of social problems. In connection to this attitudes of students towards school become demoralized due to the location of school. Most of schools in the area of the study are situated in rural (remote areas) such location hinders and decrease attitudes of students to continue with their study. Hijazi andNaqvi (2006) held the view that students' performance is associated with students profile like his attitudes towards class attendance, time allocation of studies parents' level of income, mothers' age and education. Not only performances, but location of school accelerates many social issues as commented by(Sen,2010) that poor attendance not only affect students' academic achievements but also promotes a non educated society and thus leads to different types of negative community problems.

Various literatures tried to show various ways on how to improve students' academic performances. Katamei and Omwono(2015) suggested various strategies which includes; parental involvement strategy, behavior modification strategy, provision of support programs strategy, capacity building strategy, provision of life skills strategy, academic indicators strategy. Burden(2005) insist on provision of support programs strategy such as counseling programs, guide students, remedial coaching to slow students are poorly tutored, providing academic and

psychological support, mentoring, counseling, coaching, advice and guidance and tutoring. In addition learners can be given academic support through more education, remedial education and reading book.

The Education Trust (2005) indicated that the presence of a caring adult in their life is significant in helping learners to overcome the problem and effective at school. Adeniyi(2004) commented on Capacity Building Strategy that for schools to achieve high public examinations, they must select qualified teachers, they should secure modern buildings, sufficient infrastructures and apparatus must be provided to improve teaching and learning while supervision of teaching is carried out for quality control. According to Rooth(2000) points out that Life skills are needed for successful living in the 21stc . Life skills comprise good work culture, caring behavior and the capacity to cope as well as to produce one's own opportunities.

World Bank(2002) notes that learners' accomplishment is assessed by the check term or education cycle. Therefore, the quality of the grades and the number of students that pass in different grades decide the level of academic achievement. Hence rewards should be given to rise interest and their attitudes towards school, hence good performance or grade that student attain in testes or examinations done at the conclusion of the subject.

2.8 Strategies to extend Access

Successful policies to address inequality in education approached both supply and demand-side constraints with the effective strategies to bringing schools to the children in rural areas by building small schools with multi-grade teaching and high quality, relevant learning materials, use instructional technology to overcome the challenges of distance, insufficiently prepared teachers and the lack of educational materials, increasing supply , particularly in remote areas, often entails buildings small schools closer to population clusters (CERC,2008:122-123).

CHAPTER THREE

3. RESEARCH METHODS AND MATERIALS

3.1 Description of the study area

3.1.1 Location

Damboya *Woreda* is found in *KembataTembaro Zone* in SNNPR of Ethiopia at a distance of 115km west of *Hawasa*, 259km south of *Addis Ababa* and 14km north of Durame town. Astronomically the*Woreda* lies at the coordinates of 7˚27' to 7˚42' north latitude and 37˚34' east to 38˚07′east longitude. Relatively the *Woreda* is located in the north of Kedida Gamela*Woreda*, south of Shashogo*Woreda (*Hadiya *zone*), east of Angacha*Woreda* and west of Halaba Qulito *zone(Damboya Woreda administrative office 2021/2022)*.

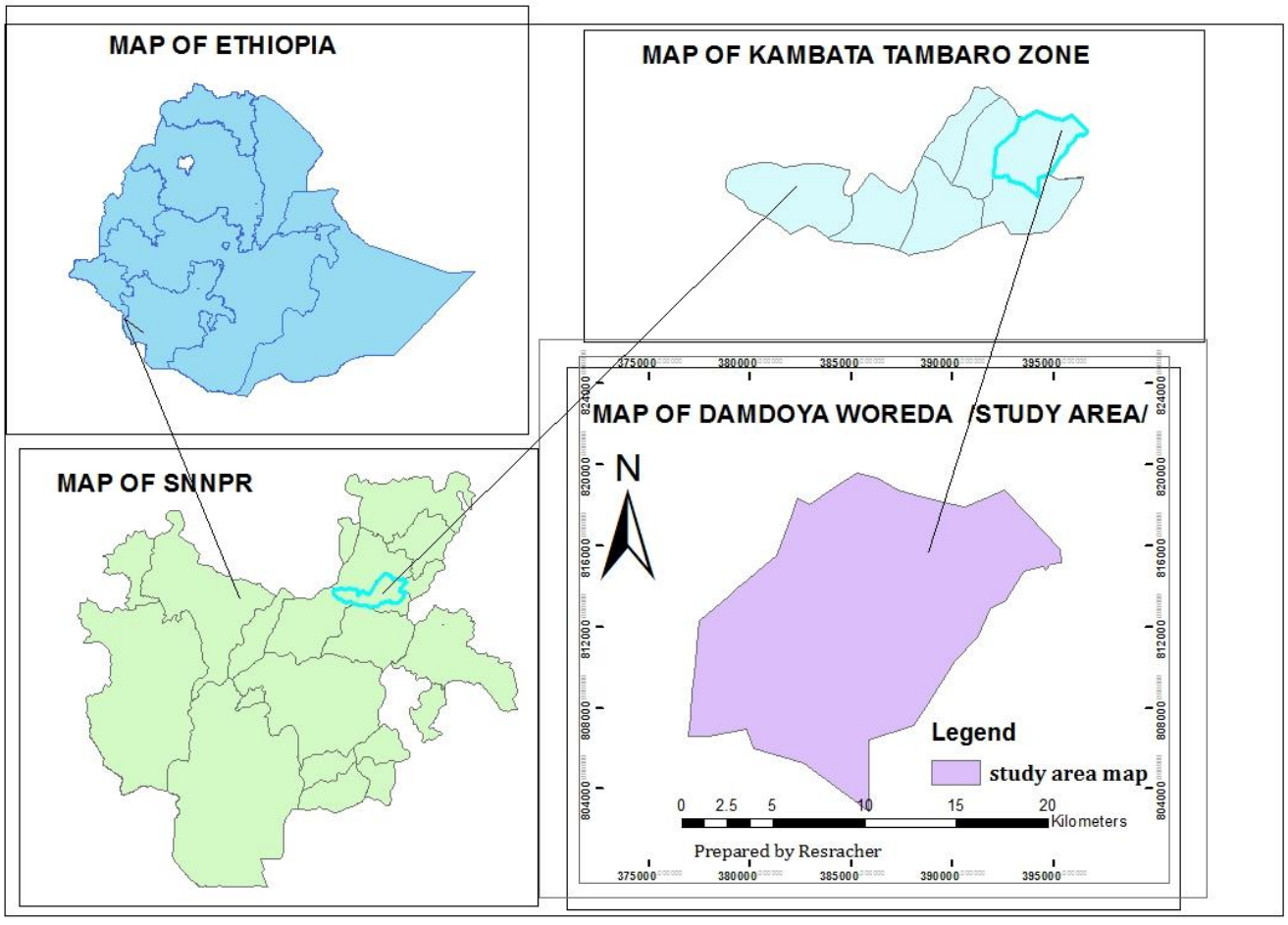

Figure 3. 1 Map of the study area (Researcher& Arc GIS10.4.1)

3.1.2 Topography and Drainage

Damboya *Woreda* accounts different ups and down landmasses and it is characterized by plain, mountain and plateau with 27%, 47% and 12% share respectively. Damboya *Woreda* does not have big mountains; there are some small mountains like Wondo and Dato Mountains. On the other hand the study area does not have big drainage system, but there are small rivers which are temporary and stops during winter season. Some of them include Sissa and Legebora River (Agricultural and Natural Resource Office of Damboya*Woreda,* 2017).

3.1.3 Local Climate

Damboya*Woreda* has three agro-climatic zones, *Dega, Woyne-dega and Kola*. The mean annual rainfall of the *Woreda* is about 500mm- 960mm.The mean temperature is 18˚c-26˚c.The major economic activity of the *Woreda* is subsistence mixed agriculture that entirely depends on seasonal rainfall. The main crops grown in the study area are wheat, Barley, pea, Teff, Maize and Inset (Agricultural Office of Damboya *Woreda,* 2020/2021).

3.1.3.1 Temperature Distribution

Temperature is the hotness or coldness of something. The degree and intensity of temperature determines the rate of vapor-transpiration, soil moisture content and the humidity of atmosphere. The mean annual temperature of the Damboya*Woreda* is 18˚c- 26˚c coldest and hottest amount of temperature respectively. However temperature of the kola *Kebeles* is hottest while *Dega Kebeles* experience coldest temperature. The hottest months of the year is April with a temperature of 27˚c and the coldest month is December with a temperature of 16˚c. Moreover, the Damboya*Woreda* has varied agro- climatic condition. This made the *Woreda* to be endowed with production of different commercial and food crops(Damboya Woreda Agricultural Office,2020). Refer the temperature distribution below in (figure 3.2).

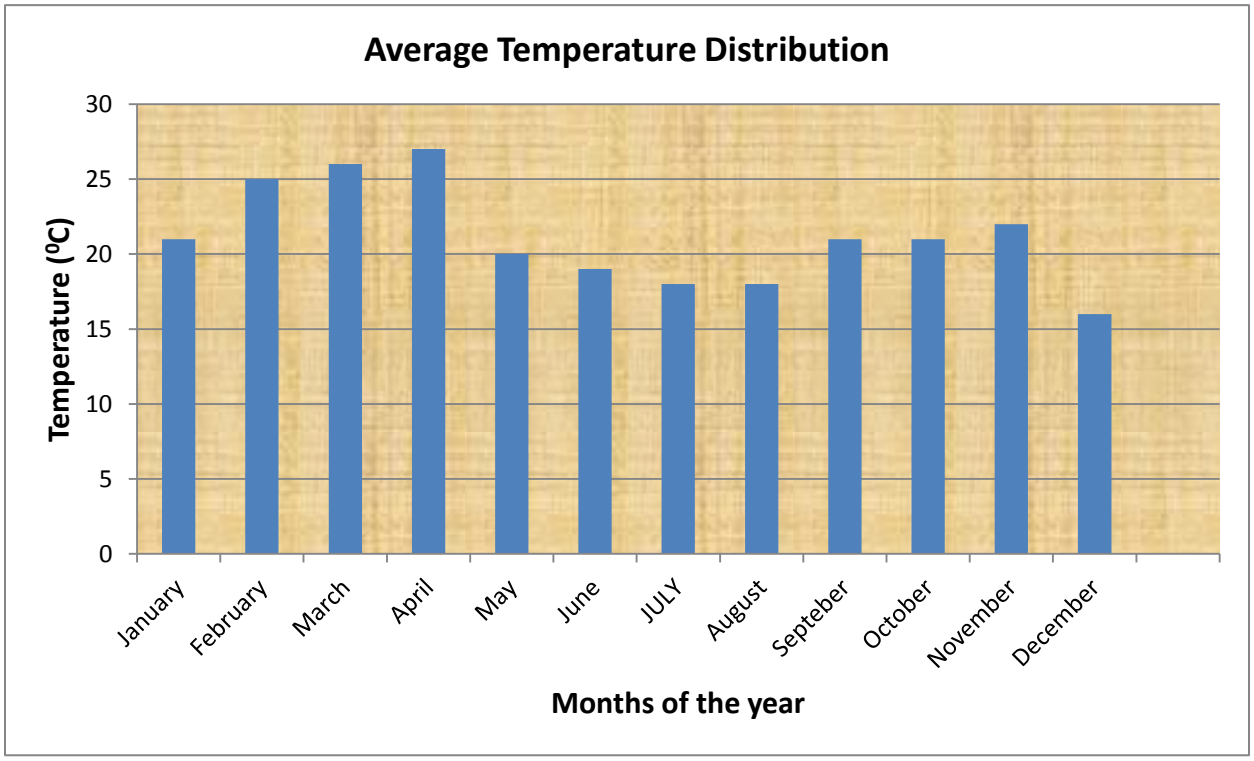

Figure 3. 2 Temperature distributionof Damboya Woreda(Damboya Woreda agricultural office (2020)

3.1.3.2 Rainfall Distribution

The amount and duration of rainfall in the Damboya*Woreda* is determined by seasonal factors of rainfall. The amount, duration and intensity of rainfall in the *Woreda* are decreased south west to north east and vice versa. The main dry season in the *woreda* is *Bega*, it is shortest season. *Kiremt* (June, July and August) is the main rainy season and the most important crop grown season in the Woreda. Small rainy season is *Belg*/spring season, in this season some *Kebeles* of the *Woreda* produce small amount of crops. The amount of lowest rainfall is experienced in the *Dega* and *Woine-DegaKebeles*. The mean annual rainfall of the *Woreda* is about 500-900mm (Agricultural Office of Damboya*Woreda,2020*). However, in each of the season the rain may begin earlier and lasts before the usual time. This has impact on growing period and reliability of rainfall (See figure 3.3 below).

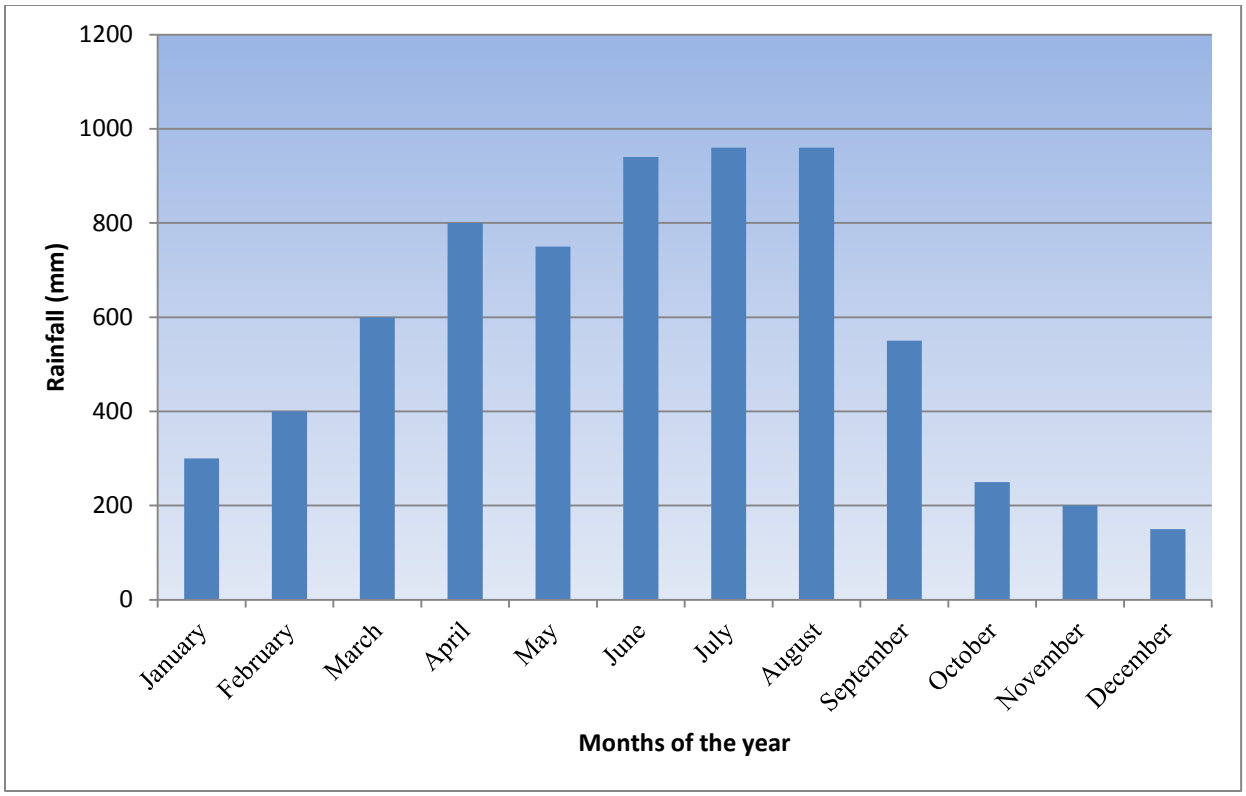

Figure 3. 3 Rainfall distribution of Damboya *Woreda* (Damboya *Woreda* Agricultural Office).

3.1.4 Population

The *Woreda* has a total population 82,622 of whom 41,543are men and 41,079 are women; 8,122 or 9.83% of its population are urban dwellers (CSA, 2007). The sex structure of the study area is nearly balanced. But in terms of composition, the dominance of young age population is high, while old age population is much smaller. This indicates the study area is characterized by low life expectancy. The total area of the *Woreda* is about 163.12 km2.Damboya*Woreda* is one of the densely populated *Woreda* in kembata tembaro zone, with the density of 507p/km2 (Damboya *Woreda*Agricultural Office, 2020). The majority of inhabitants are Protestant 82.07%, 10.35% are Muslim, 5.17% Orthodox Christianity, and 2.23% are Catholic (CSA, 2007). There are thirty (30) government primary schools in the *Woreda*(Educational Office,2020/2021EC). It has three (3) urban and seventeen (17) rural total of 20 *Kebeles*(Agricultural Office,2020).

Table 3. 1Population number of Damboya *Woreda by Kebele*

No	*Kebeles*' name of Damboya *Woreda*	Population number			%
		M	F	T	
1	Gendela	2533	2568	5101	3.43
2	H.Gotmena	1613	1546	3159	2.1
3	Megere	1900	1914	3814	2.6
4	H.Laloamo	1675	1784	3459	2.3
5	Dato-Darabora	3471	3463	6934	4.7
6	Bonga	5646	5533	11179	7.5
7	Hamancho	4377	4488	8865	6
8	Qoxa-Kombola	2680	2568	5248	3.5
9	Ambericho	2283	2350	4633	3.1
10	Geremba	4772	4871	9643	6.5
11	Geyoxa-Gerba	22843	2833	5676	3.81
12	Hego	4960	5046	10006	6.7
13	Wondo	2812	2906	5718	3.84
14	Yebu	5313	5188	10501	7.1
15	Heba-Dato	5811	6626	12437	8.4
16	Kazala	2933	2750	5683	3.82
17	Gonji	2908	3031	5939	4
18	Damboya 01	7306	7521	14827	10
19	Damboya 02	7446	7522	14968	10.1
20	Funo	588	421	1009	0.7
Total	20	73870	74929	148799	100

Source: Damboya *Woreda* plan Office (2020/21).

3.2 Research Approaches

The study used Quantitative research approach because it is used to analyze number based data by using various statistical techniques.

3.3 Research Design

The study used descriptive survey design because it is used to describe the data, obtained from primary and secondary sources about the current status of spatial distribution of primary schools in terms of population number, spatial accessibility of schools to the students and the effects of spatial distribution of primary schools on students' academic performance in the study area.

3.4 Sampling techniques

Non-probability sampling especially purposive sampling was used to select the study area. The study used the total government owned primary schools (30) existed in 20 *Kebeles* of the study area to identify the spatial distribution of primary schools, spatial accessibility of primary schools to students and the effects of primary schools to students academic performance.

3.5 Types and sources of data collection

Both primary and secondary data were employed for this study. The primary data used for this study includes; the x y coordinates of primary schools (Latitudes, Longitudes, Altitudes, and point Data)schools collected through field survey by the researcher using Garmin handled GPS instrument. Secondary data used for this study were Demographic Data, names of *Kebeles* of the study area, names of Primary Schools, areal size of the Woreda and each *K*ebeles of the study area, students' profile of 2021/2022 (no of enrolled students, no of dropouts and student result), Digital Orthophoto of Damboya *Woreda*(2017), map of Ethiopia and Ethio-*Kebeles*.

- Demographic data were collected from Damboya *Woreda* Finance and Plan office
- Name of *Kebeles* and primary schools of the study area were obtained from Damboya *Woreda* Administrative office and Educational office
- Total areal size of the *Woreda*'s and *each Kebeles* from Administrative office of Damboya *Woreda*
- 2021/2022 Students' profile (Dropout, Enrollment and their results) from Damboya *Woreda* Educational office and Schools' Directors' office).

- Digital Orthophoto from Damboya Woreda agricultural office used for extraction of spatial data.
- Map of Ethiopia and Ethio-*Kebeles* from SNNPR statistical authority and from Kembata Tembaro Zone statistical Bureau.

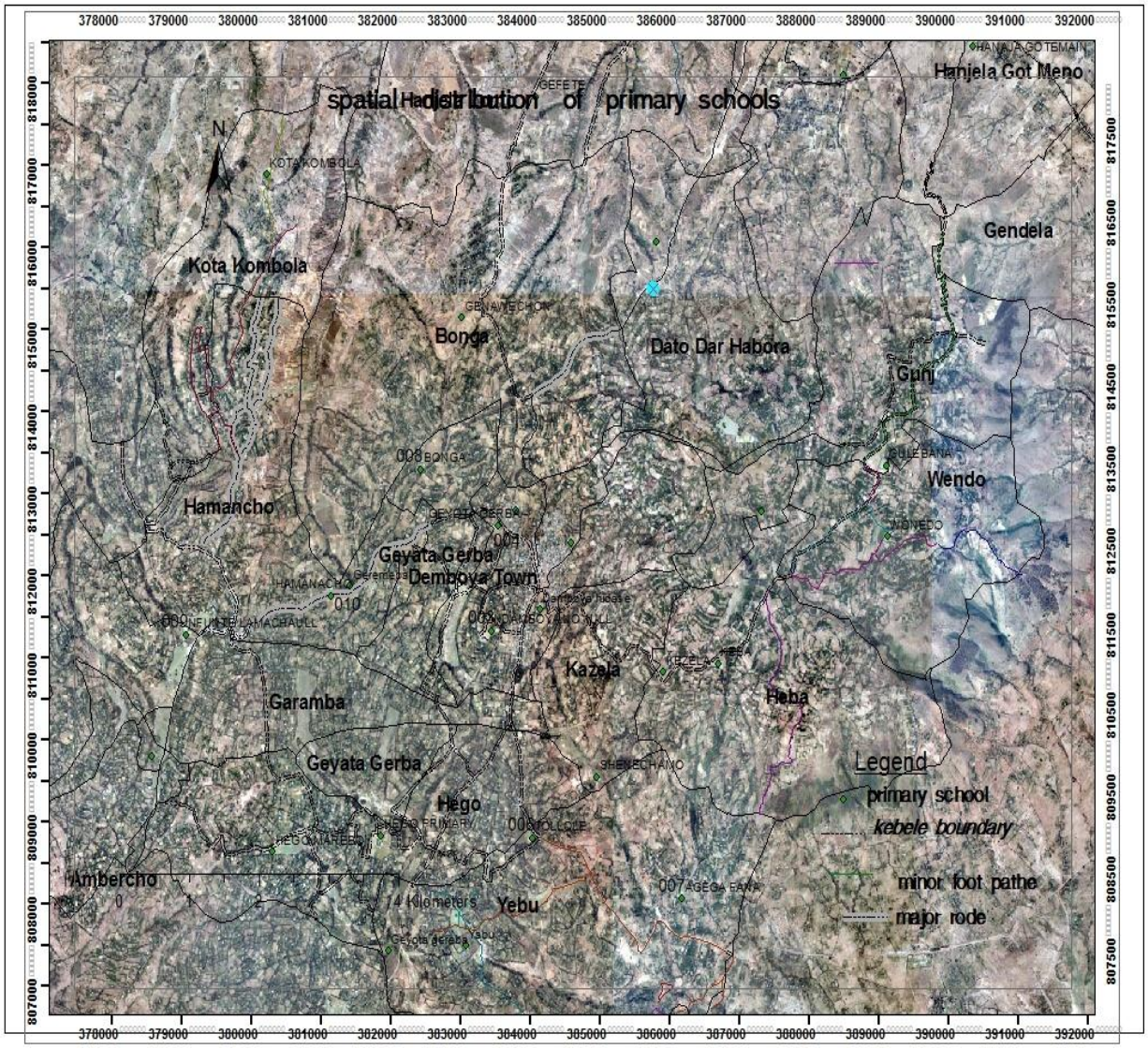

Figure 3. 4 Aerial photograph of Damboya Woreda(Agricultural Office of Damboya Woreda,2017).

Soft Ware and equipment's

- Garmin handheld GPS used for collecting spatial data and identification of schools

- Arc GIS 10.1 soft ware package was used for spatial data processing, analysis and output generations
- USB driving soft ware version 2.0 was used to connect peripheral devices to computers
- Geo-processing measurement tool used to measure travel distance of students from their home to various primary schools in the study area

3.6 Data analysis

It is the procedure of methodically using statistical and or logical methods to explain and clarify, squeeze, recap, and estimate data.The collected primary and secondary data used for this study were analyzed by using different types of statistical techniques and software applications. Spatial distribution of primary schools in terms of population number examined by using Location Quotient, Lorenz Curve, Ratio, percentage and Bare Graph and table.

Location Quotient: this analysis was carried out to show the extent of spatial inequality and the degree of concentration of primary schools in Damboya Woreda. LQ was computed by dividing number of primary schools in particular Kebele to total primary schools in the Woreda by the number of population of particular Kebele to the total population of the Woreda. It is calculated by applying the following formula:

$$LQ = \frac{ni/p}{Ni/P}$$

Where

ni = number of schools in a particular Kebele

Ni = number of schools in the Woreda

p = number of population in a particular Kebele

P = number of population in the Woreda

- LQ < 1.0 indicates that a particular kebele is disadvantaged in the location of primary schools

- ❖ LQ > 1.0 show that a particular kebele is advantaged in the location of primary schools in the study area (Wheeler 2005).

Lorenz Curve

It is a statistical tool broadly applying in Geography to calculate disparity. It is a graph showing the proportion of overall variables assumed by the bottom X% of the population. It is used in this study to represent primary schools distribution where it shows for the bottom X% of population, what percentage Y% of the total primary schools they have. The percentage of population is plotted in the X- axis, the percentage of primary schools on the Y-axis. A perfectly equal schools distribution is where the bottom N% of population would always have N% of the schools. For this study Lorenz Curve is used to show the inequality of schools among population in study area.

Ratios and percentages:-were also used to describe the ratio of a number of schools to people by kebele in order to check whether the distribution of schools fit the UNESCO standard of 1:10000 as cited on Wazzan(2017:77-78). The kebeles are benefited when the ratio of school to population is lower and the kebeles are not benefited when the ratio is higher than the recommended standard.

Bar Graph:-is another graphical tool used for displaying statistical data. The study used bar graph to represent the ratio of schools to population by kebeles in the study area.

Travel distance analysis was used to evaluate the accessibility of primary schools to students' through the help of Arc GIS 10.41geo-processing measurement tool. It was examined at 0-2kms, 2-3kms 3-5kms and greater than 5kms. Based on the UNESCO recommended standard of 2kms of travel distance of students from their settlements to various schools as cited in Ogunyemi(2014) ,the researcher identified whether the students accessed or non-accessed the schools in the study area. Students that travel below 2km they accessed the primary school easily, while, students travel above 2km, they were not accessed the school easily.

The effects of spatial distribution of primary schools to students academic achievement was identified by using 2014EC students profile such as number of enrolled students, number of dropout students from the schools, list of each students locality (Kebele & Gox), and 2014EC

students' result. Then the researcher compared the number of dropout students with travel distance and their results. Finally the researcher concluded how distance of schools affects students' academic achievement in the study area.

CHAPTER FOUR

4. RESULTS AND DISCUSSION

4.1. Spatial Distribution of Schools in terms of population number

The field survey revealed that there are 30 government owned primary schools distributed in 20 different *Kebeles* of Damboya Woreda. Among *Kebeles*, the maximum number of primary schools is found in Yebu *Kebele* as opposed to Damboya01, Heba-Dato, Bonga and Hego with a single primary school for each which supports high population concentration. In terms of allocation of primary schools; areas with small number of population, such as Kazala, Wondo, Gonji and Dato- Darabora served well than areas with large number of population concentration such as Damboya 01, Heba-Dato,Bonga and Hego. The information in the table below reveals that the allocation of primary schools in Damboya*Woreda* is uneven indicating inadequacy and inequality in the allocation of primary schools among the various Kebeles in the study area. Some *Kebeles*are well served while some others are poorly served.

Table 4. 1 Spatial distribution of government owned primary schools in terms of population number

Kebele names	Population numbers	No of primary schools
Gendela	5101	1
Gotmena	3159	1
Megere	3814	1
Hanja-Laloamo	3459	1
Dato-Darabora	6934	2
Bonga	11179	1
Hamancho	8865	1
Qoxa-Kombola	5248	1
Ambaricho	4633	1
Geremba	9643	1
Geyota-Gerba	5676	1
Hego	10006	2

Wondo	5718	2
Yebu	10501	4
Heba-Dato	12434	1
Kazala	5683	2
Gonji	5939	2
Damboya 01	14827	1
Damboya 02	14968	2
Funxo	1009	1
Total	148799	30

Source: Damboya Woreda Educational and Plan Office (2020)

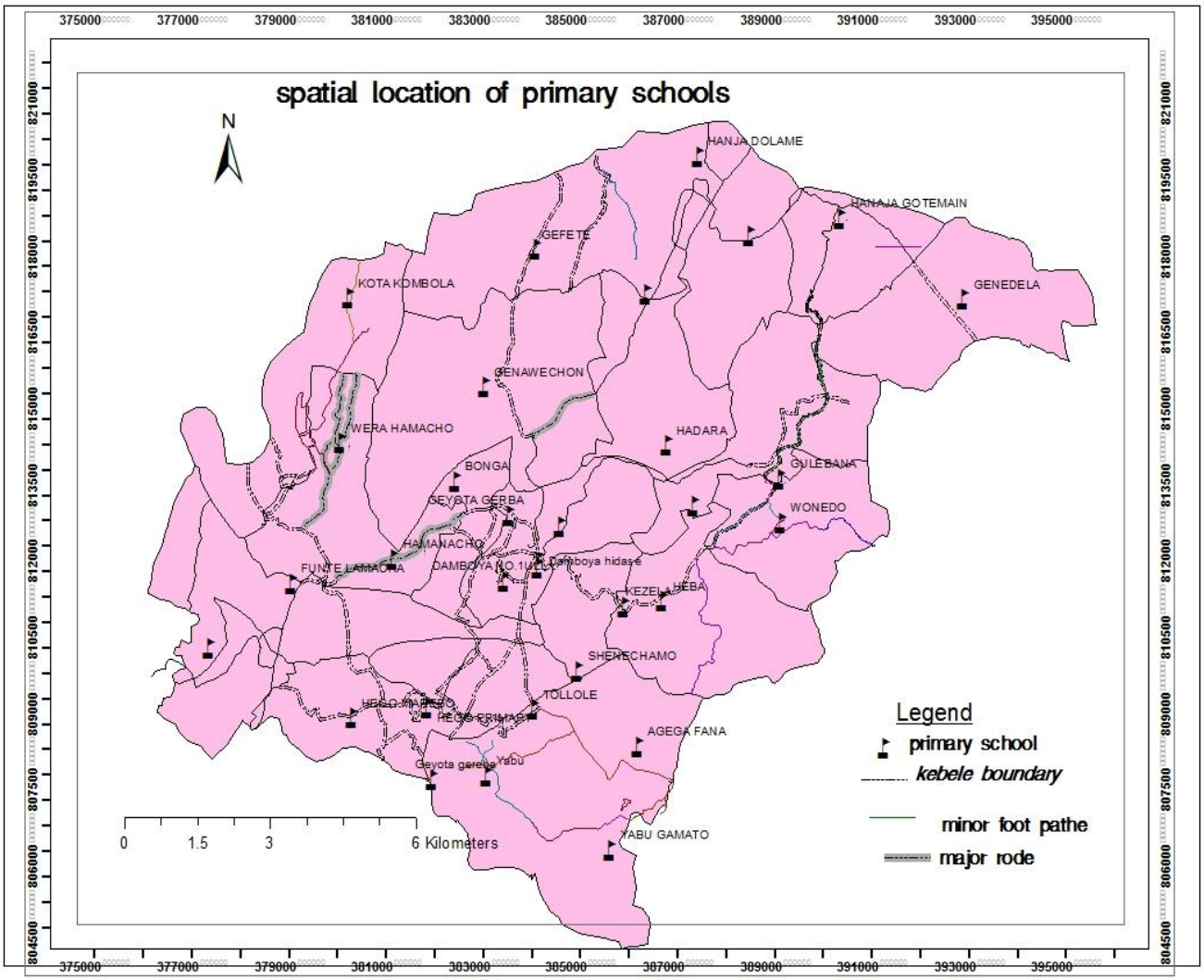

Figure 4. 1 spatial distributions of schools (Arc GIS 10.4.1).

4.1.1 Location Quotient (LQ) of primary schools

Table 4.2 below indicated that the level of LQ value of primary schools of each kebeles of Damboya woreda. As indicated in table 4.1.1 below, at the level of kebeles the LQ value varies between (4.9) in Funxo the most advantaged and (0.3) in Damboya 01 the most disadvantaged kebele. Among 20 existing kebeles 11 kebeles (55%) are marginally advantaged in the distribution of government owned primary schools, having LQ of more than 1.0. These are: Funxo (4.9), Yebu (1.8), Kazala (1.74), Wondo (1.73), Gonji (1.67), Gotmena (1.57), Dato-Darabora (1.43), Hanja-Laloamo (1.42), Megere (1.3), Hamancho (1.1) and Ambaricho (1.07) are marginally advantaged kebeles. The remaining (9) kebeles (45%) are marginally disadvantaged in terms of distribution of government owned primary schools, having location quotient values less than the recommended value of one(1.0). These are Damboya 01 (0.3), Heba-Dato (0.39), Bonga (0.4), Geremba (0.5), Geyoxa-Gerba (0.87), Qoxa-Kombola (0.94), Gendela (0.97) and Hego (0.99).

Table 4. 2 Location Quotient of government owned primary schools in Damboya Woreda

Kebele names of Damboyaworeda	Total population number (2013 E.C)	Number of schools	Location quotient (LQ)
Gendela	5101	1	0.97
Hanja-Gotmena	3159	1	1.57
Megere	3814	1	1.3
Hanja-Laloamo	3459	1	1.43
Dato-Darabora	6934	2	1.43
Bonga	11179	1	0.4
Hamancho	8865	2	1.1
Kota-Kombola	5248	1	0.94
Ambarcho	4633	1	1.07
Geremba	9643	1	0.5
Geyota-Gerba	5676	1	0.87
Hego	10006	2	0.99
Wondo	5718	2	1.73

Yebu	10501	4	1.8
Heba-Dato	12437	1	0.39
Kazala	5683	2	1.74
Gonji	5939	2	1.67
Damboya 01	14827	1	0.3
Damboya 02	14968	2	0.66
Funxo	1009	1	4.9
Total	148799	30	

Source: Damboya Woreda educational and plan office (2020/21).

4.1.2 Relation of schools to population using Lorenz Curve

Table 4.3 below shows the relationship between population and school distribution. The study revealed that the level of spatial distribution of schools is uneven and inequality of primary school between *Kebeles* in Damboya*Woreda*.

The shape of Lorenz curve below indicated that 37% of primary schools are enjoyed by about 49.6% of population, which indicating inadequacy and inequality in the allocation of primary schools among the various *Kebeles* in the study area, and the remaining 57% of primary schools are enjoyed by 51.4% of population, indicating equality and balancing location of primary schools in the study area. See the table 4.3 and figure 4.2 below)

Table 4. 3 Lorenz Curve of population and number of primary schools

Kebelenamesof Damboyawored a	Total population (2013 E.C)	Percentage (%)	Cumulative percent (%)	Number of schools	Percentage (%)	Cumulative percentage (%)
Gendela	5101	3.4	3.4	1	3.33	3.33
HanjaGotmena	3159	2.1	5.5	1	3.33	6.66
Megere	3814	2.6	8.1	1	3.33	9.99
HanjaLaloamo	3459	2.3	10.4	1	3.33	13.32
Dato-Darabora	6934	4.7	15.1	2	6.66	19.98
Bonga	11179	7.5	22.6	1	3.33	23.31
Hamancho	8865	6.0	28.6	2	6.66	29.97

Kota-Kombola	5248	3.5	32.1	1	3.33	33.3
Ambarcho	4633	3.1	35.2	1	3.33	36.63
Geremba	9643	6.5	41.7	1	3.33	39.96
Geyota-Gerba	5676	3.8	45.5	1	3.33	43.29
Hego	10006	6.7	52.2	2	6.66	49.95
Wondo	5718	3.8	56.0	2	6.66	56.61
Yebu	10501	7.1	63.1	4	13.33	69.94
Heba-Dato	12437	8.3	71.4	1	3.33	73.27
Kazala	5683	3.8	75.2	2	6.66	79.93
Gonji	5939	4.0	79.2	2	6.66	86.59
Damboya 01	14827	10.0	89.2	1	3.33	89.92
Damboya 02	14968	10.1	99.3	2	6.66	96.58
Funxo	1009	0.7	100	1	3.33	100
Total	148799	100	-	30	100	-

Source: Damboya *Woreda* Educational and Plan Office (2020/21)

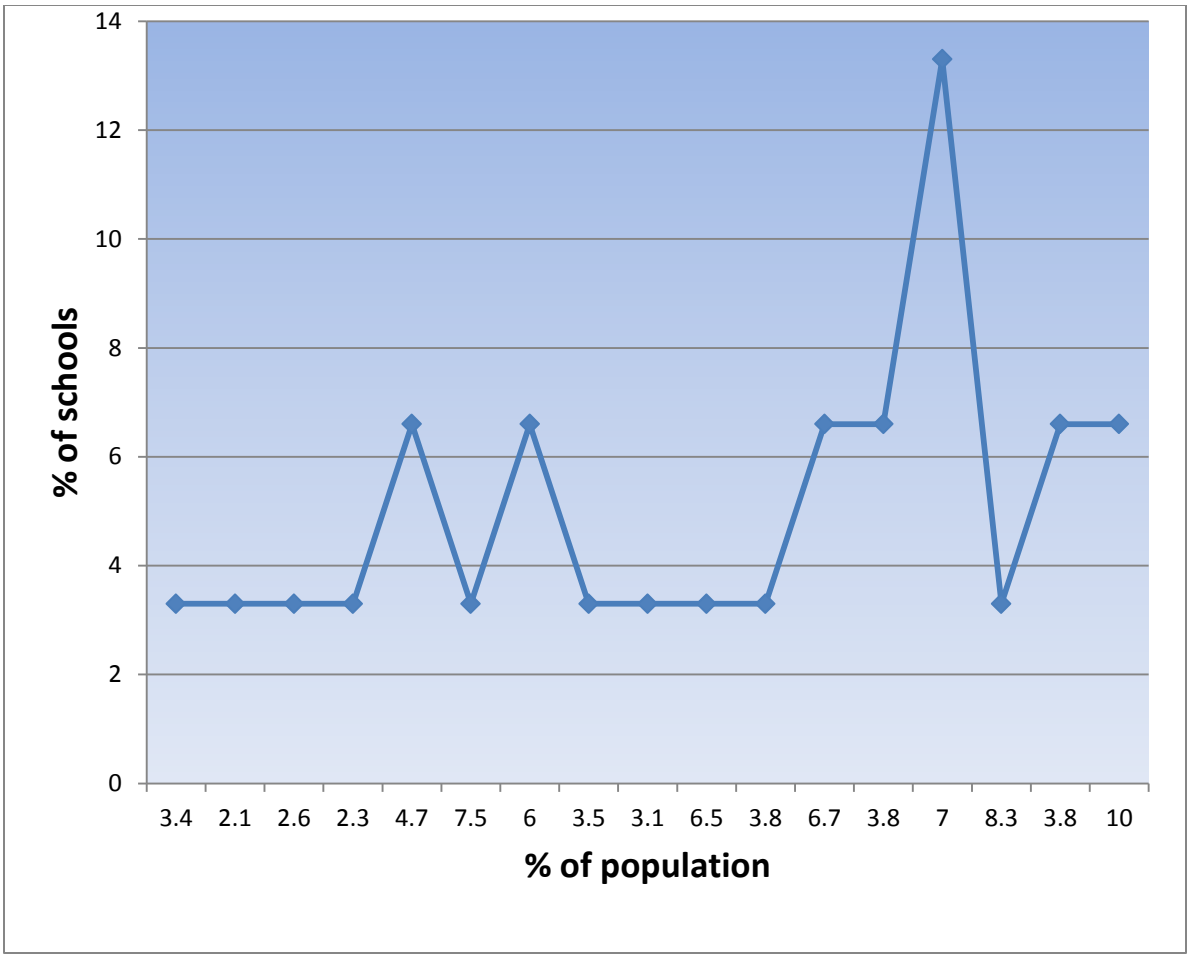

Figure 4. 2 The shape of Lorenz Curve for primary schools(Researcher(2021/22)

4.1.3 Ratio of schools to population

The Ratio schools/population 1:10000recommended standard of UNESCOas cited in (Wazzan 2017) primary schools to population reveal that the *Woreda*/ the *Kebele* is advantaged when the ratio is lower, or disadvantaged when higher.

The study indicated that at the *Woreda* level the ratio of school to population is 1:4960.For each Kebeles, the ratio of school/population reveals that 3 *Kebeles* in the *Woreda* are disadvantaged with ratio higher than (1:10000). These are Damboya 01, Heba-Dato, and Bonga, having all a close ratio (1:14827), (1:12437), (1:11179), respectively and representing 25.8% of the Woredas's inhabitants. The 17 advantaged kebeles with ratio lower than (1:10000)are Funxo, (1:1009),Yebu (1:2625), Kazala (1:2842), Wondo (1:2859) and Gonji (1:2969), Hanja-Gotmena (1:3159),Hanja-laloma (1:3459), Dato-Darbora (1:3467), Megere (1:3814),Hamancho (1:4433), Ambaricho (1:4633), Hego (1:5003), Gendela (1:5101), Qoxa-Kombola (1:5248), Geyoxa-Gerba (1:5676), Damboya 02 (1:7484), Geremba (1:9643), representing 74.2% of the woreda's inhabitants. The result of the study indicated that the spatial distribution of government primary schools in the study area is not considering population number.

Table 4. 4 The ratio of schools to population by Kebeles

Kebele names of Damboyaworeda	Total population number (2013E.C)	Number of schools	school to population ratio
Gendela	5101	1	1:5101
Hanja-Gotmena	3159	1	1:3159
Megere	3814	1	1:3814
Hanja-Laloamo	3459	1	1:3459
Dato-Darabora	6934	2	1:3467
Bonga	11179	1	1:11179
Hamancho	8865	2	1:4433
Kota-Kombola	5248	1	1:5248
Ambarcho	4633	1	1:4633
Geremba	9643	1	1:9643
Geyota-Gerba	5676	1	1:5676
Hego	10006	2	1:5003

Wondo	5718	2	1:2859
Yebu	10501	4	1:2625
Heba-Dato	12437	1	1:12437
Kazala	5683	2	1:2842
Gonji	5939	2	1:2969
Damboya 01	14827	1	1:14827
Damboya 02	14968	2	1:7484
Funxo	1009	1	1:1009
Total	148799	30	1:4960

Source: Damboya *Woreda* Plan and Educational Office(2020/21)

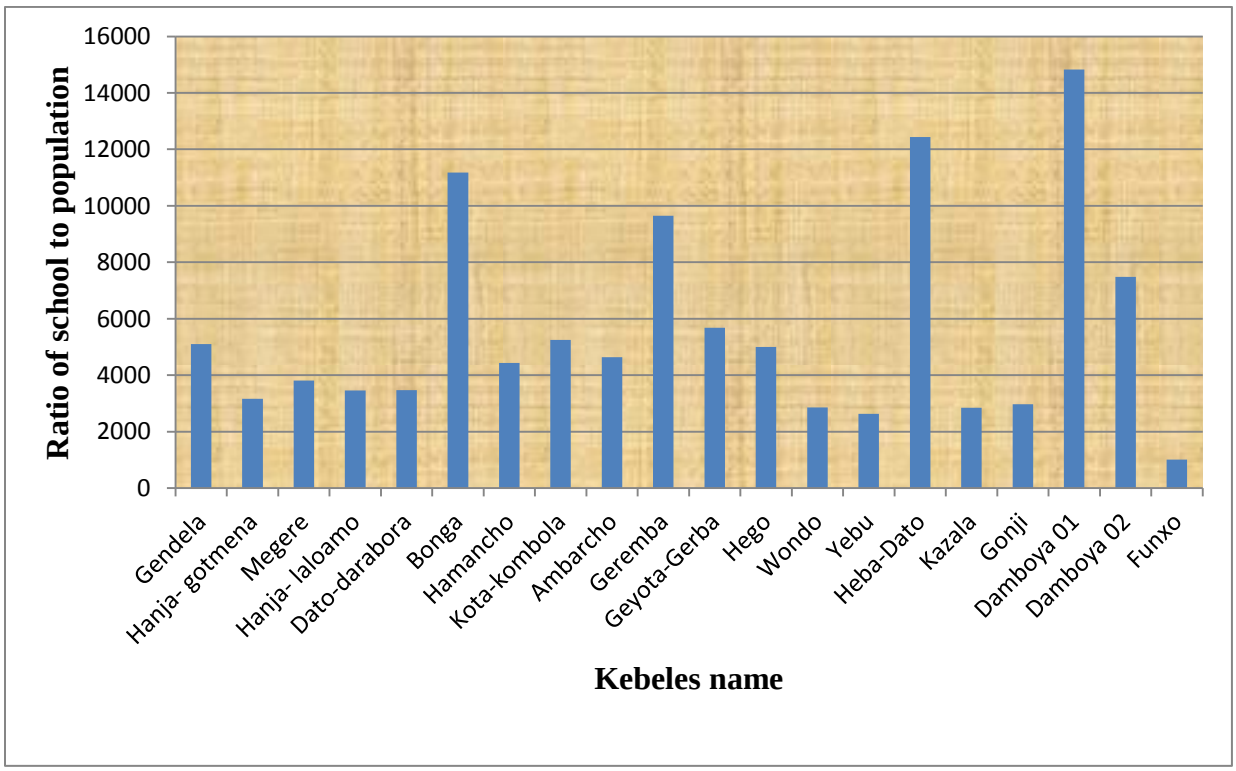

Figure 4. 3 The ratio of schools to population (Educational Office of Damboya Woreda (2021/22)

4.2 Spatial Accessibility primary of Schools

4.2.1 Travel distance analysis

The distance of schools affect students, especially those who are living far away from schools. Some of the challenges that faced students due to location of schools include absenteeism and poor attendance, decrease their academic achievement, negative attitudes toward schools and drop out from schools (Joseph 2015). Similar study conducted by Johannes (2014) in Tanzania, showed that transportation problems affect students attendance.

The result of spatial accessibility of primary schools is depicted in table 4.5. The results reveal that spatial variation in accessibility of primary schools in Daboya Woreda. Accessibility was examined at 2km, 3km, 5km, and greater than 5km. At the Woreda level, 6411**(**35.2%) of the students were accessible to primary schools at 0-2 kms distance which is the acceptable distance as per recommendation of the standard, 9257**(**50.8%) of students in the Woreda were accessing the schools with 2- 3kms distance, 2436 (13.4%) of students were expected to travel 3- 5kms. The remaining, 130 (0.7%) of students were more disadvantaged as they should travel more than 5kms to access the facility. Generally from the total students of the Woreda(18234), 11823(64.8%) of students were travel abov2kms to access the primary schools' 6411(35.2%) of the students were travel below 2km distance to primary schools. Students that travel below 2kms constitutes the lowest percentage (35.2) while students that travel above 2km distance to primary school constitutes the highest percentage (64.8) which is out of the UNESCO recommended standard. At the level of kebele highest percentage of students that travel below 2km were found in Funxo(74.7%), Damboya 01 (61.7%), Damboya02(59.7%), Gendela(58.6%) and H.Gotmena(50.4%). Opposed to this highest percentage of students that travel above two kilometers were found in Qoxa-Kombola (85.9), Geremba (83.7), Ambaricho(79.9),Yebu(78), Gonji(77.8), Bonga(77.7), Dat-.Darabora(75.9), H.Laloamo(73.6), Hamancho (73.3), Wondo(71.5), Hego(69.7), G.Gerba(66.6), H. Dato (65.3) and Megere (56.2) respectively.

The table 4.5 and map 4.4 below shows the spatial accessibility of primary schools in the study area.

Table 4. 5 Travel distance of students from their home to various primary schools

Kebele name	No of students that travel different distances(kms)								
	0-2	%	2-3	%	3-5	%	>5	%	Total
Gendela	396	58.6	170	25.2	109	16.1	--		675
Hanja-Gotmena	210	50.4	99	23.7	108	25.9	--		417
Megere	260	43.8	310	52.3	23	3.88	--		593
Hanja-Laloamo	127	26.4	150	31.2	204	42.4	--		481
Dato-Darabora	210	24.1	560	64.4	100	11.5	--		870
Bonga	241	22.3	650	60.2	189	17.5	--		1080
Hamancho	296	26.7	748	67.6	63	5.7	--		1107
Kota-Kombola	83	14.2	232	39.7	270	46.2	--		585
Ambarcho	106	20	372	70.3	51	9.6	--		529
Geremba	163	16.3	530	52.9	309	30.8	--		1002
Geyota-Gerba	228	33.3	388	56.7	68	9.9	--		684
Hego	440	30.8	796	55.7	194	14	--		1430
Wondo	246	28.5	432	50.1	185	21.4	--		863
Yebu	330	21.9	860	57	319	21	--		1509
HebaDato	488	34.8	680	48.5	105	7.5	130	9.3	1403
Kazala	346	41.8	430	52	52	6.3	--		828
Gonji	202	22.2	620	68.2	87	9.6	--		909
Damboya 01	820	61.7	509	38.3	--	--	--		1329
Damboya 02	918	59.7	619	40.3	--	--	--		1537
Funxo	301	74.7	102	25.3	--	--	--		403
Total	6411	35.2	9257	50.8	2436	13.4	130	0.7	18234
Percentage (%)	35.2		50.8		13.4		0.7		100

Dambova Woreda educational office

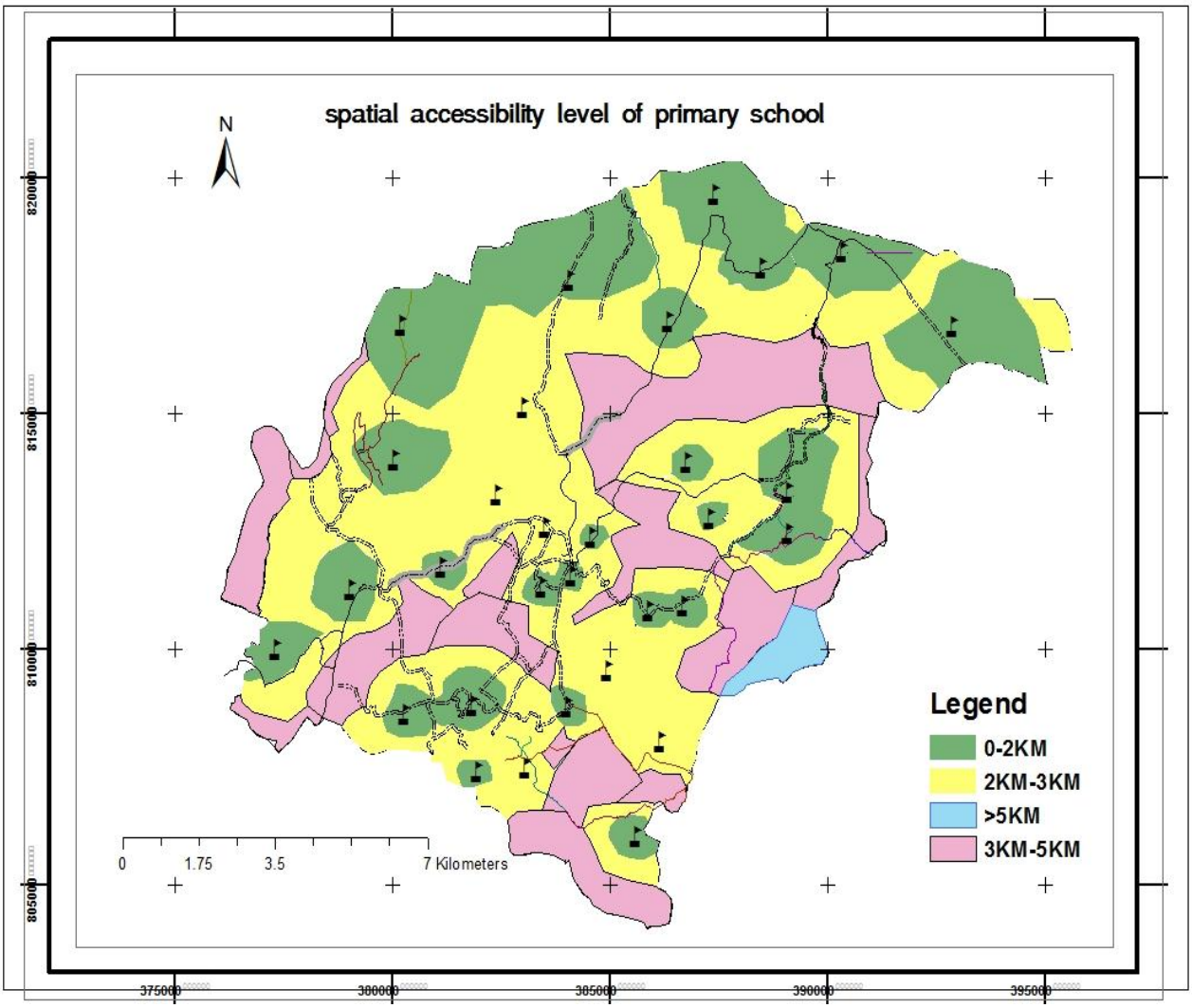

Figure 4. 4 travel distance of students from their home to schools (Arc GIS).

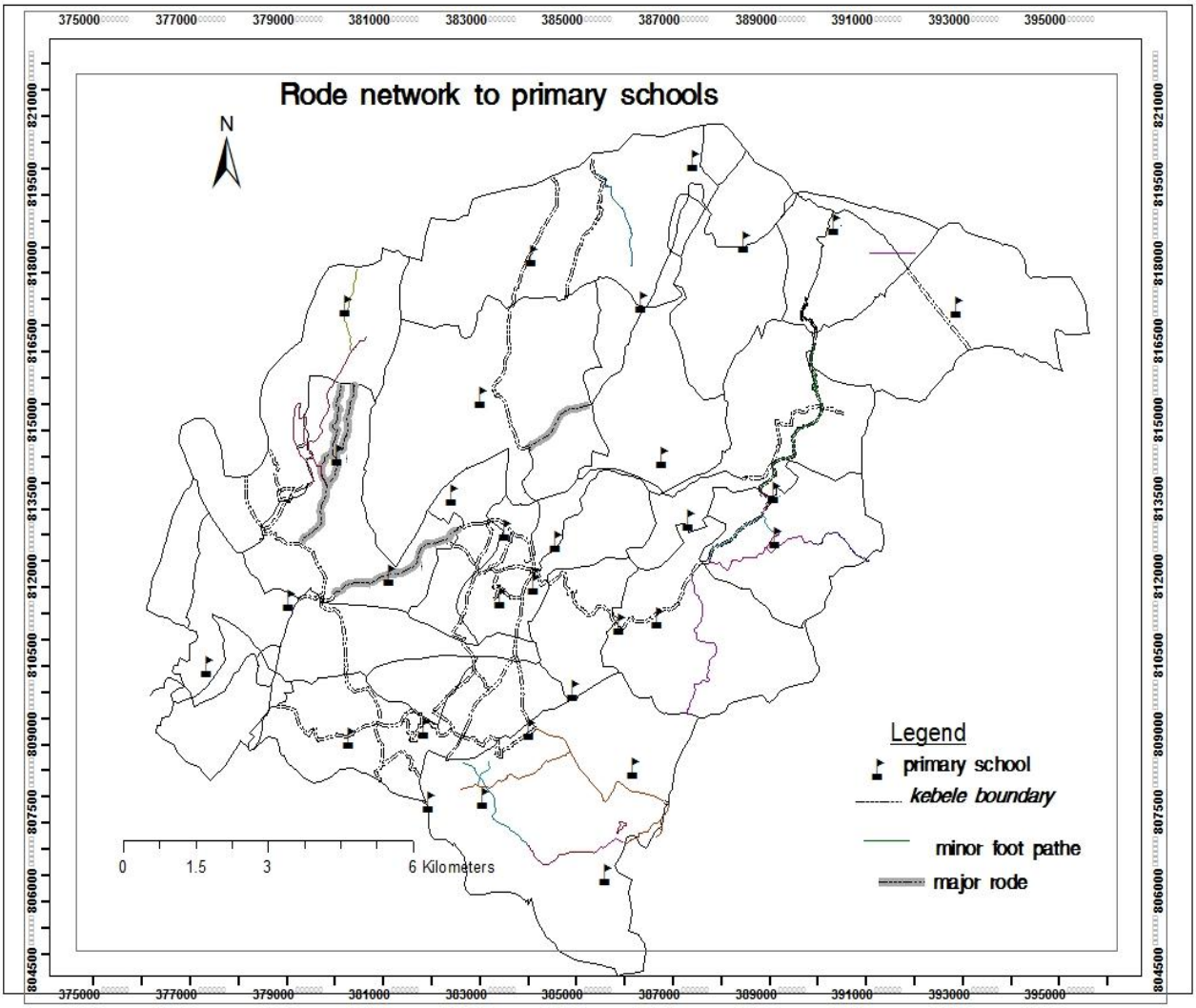

Figure 4. 5 Road network to primary schools (Arc GIS)

4.3 The Effects of Spatial Distribution of School on Students academic performance

4.3.1 Dropouts

Under the objective of the effects of spatial distribution of primary schools to students' academic performance, the study result indicated that at the Woreda level, out of the total enrolled 18234 (9175 (49.8%)male and 9059(49.7%)) female students,1351(729(54%) male and 622 (46%)

students were dropout from the school in 2014EC academic year. The table below indicated that students that travel below 2km to access the school constitute 18.4% of dropout from the school, while, students that travel above 2kms constitute81.6% of dropouts from the school at the Woreda level. This refers students that travel below 2kms to access school constitutes lowest percentage, while students that travel above 2kms constitute the highestpercentage of dropouts. At the kebele level the lowest percentage of dropouts were found in Funxo(0.9%), Damboya 02(1.4%), Damboya 01(1.4%) Gotmena (2.7%) and Gendela(2.9%). These kebeles are urban and sub-urban kebeles. On the other hand the highest percentage of dropout students were found in rural kebeles of Bonga(8.1%), Dato-Darabora(8%), Hego(7.3), Qota-Kombola(6.7%), Hanja-Laloamo(6.7%) Hamancho(6.4%), Geremba(6.3), Yebu(6.1%) and Gonji(5.3%). From this it is simple to conclude that distance of schools accelerate dropout of students from the school. The following table show no of dropouts of students from the school.

Table 4. 6 The number of dropout students from the school during academic year of 2022.

Kebles of the study area	Enrolled students In 2022	No of Dropout students from the school								Total	Percentage (%)
		0-2km	%	2-3km	%	3-5km	%	>5km	%		
Gendela	675	15	38.5	14	23.7	10	16.9	--	--	39	2.9
H.Gotmena	417	8	22.2	17	22.4	11	14.5	--	--	36	2.7
Megere	593	12	19.4	20	32.3	30	48.4	--	--	62	4.6
H.Laloamo	481	13	14.4	32	35.5	45	50	--	--	90	6.7
D.Darabora	870	15	17	30	34	63	58.3	--	--	108	8
Bonga	1080	15	17	30	33.3	65	59.1	--	--	110	8.1
Hamancho	1107	10	11.6	35	40.7	41	47.7	--	--	86	6.4
K.Kombola	585	12	15	30	37.5	48	53.3	--	--	90	6.7
Ambaricho	529	12	19.4	20	32.3	30	48.4	--	--	62	4.6
Geremba	1002	15	19.7	36	41.9	35	46.0	--	--	86	6.3
G.Gerba	684	19	35.8	12	28.6	22	51.2	--	--	53	3.9
Hego	1430	10	10.2	38	35.2	50	46.3	--	--	98	7.3
Wondo	863	10	19.2	20	38.5	32	51.6	--	--	62	4.6
Yebu	1509	16	20	29	36.3	38	45.8	--	--	83	6.1
H.Dato	1403	13	14.4	17	19	47	40.2	40	44.4	117	8.7
Kazala	828	23	51.1	12	26.6	14	28.6	--	--	49	3.6
Gonji	909	10	16.1	30	41.7	32	51.6	--	--	72	5.3
Damboya 01	1329	9	47.4	10	21.7	-	--	--	--	19	1.4
Damboya 02	1537	7	41.2	10	58.8	-	--	--	--	17	1.3
Funxo	403	4	33.3	8	29.6	-	--	--	--	12	0.9
Total	18234	248		450		613		40	--	1351	100
Percentage	100	18.4		33.3		45.4		3		100	7.4

Source: Damboya Woreda Educational Office and Schools Directors' Office (2022).

4.3.2 Effects spatial distribution on students' result

Under the object of the effect of spatial distribution of schools on students academic performance, the researcher engaged in the study in order to check whether the spatial distribution of schools affect students academic performance or not. The study indicated that at

the Woreda level a total of 16883, 8446(50.0%) male and 8437(49.97%) female students took the exam. Out of those students about 876, 433(49.4%) male and 443(50.6%) female students scored below 50%. About 11641(68.95%), 5713(49.1%) male and 5928(50.9%) female students scored 50-74%. The remaining 4366(25.9%), 2300(52.7%) male and 2066(47.3%) female students scored above 75%.

The findings of the study reviled that at the Woreda level out of 876 students, those who scored below 50%, the highest percentage 752(86%) of students were travel above 2kms to access the facility, while only 124(14%) of students those who scored below 50% travel below 2kms to access the school.

From the total students of 16007, those who scored above 50%, the lowest percentage 4686 (29.3%) of students those who travel above 2kms to access the facility, while students those who travel below 2kms to access the school constitute the highest percentage, 11321(70.7%).

At the Kebele level the lowest percentage of students scored below 50% were found inFunxo(1.8%), Damboya 01(2.1%), Damboya 02(2.3%), Gendela(3.2%) and Hanja-Gotmena(3.4%). The remaining Kebeles constitute the highest percentage of students scored below 50%. From this the researcher concluded that distance of schools greatly affect students.

Based on the results the researcher concluded that distance of school location from students greatly affects the learners' academic success.

Table 4. 7 Damboya Woreda students result

Kebeles	2022 Students' result														
	0-49					50-74					>75				
	0-2	2-3	3-5	>5	T	0-2	2-3	3-5	>5	T	0-2	2-3	3-5	> 5	T
Gendela	3	10	15	--	28	150	127	30	-	307	200	65	36	-	301
H.Gotmena	5	8	17	-	30	57	7	5	-	69	182	65	35	-	282
Megere	7	15	31	-	53	137	100	71	-	308	120	30	20	-	170
H.Laloamo	3	15	30	-	48	93	58	30	-	181	90	60	12	-	162
D.Darabora	7	8	40	-	55	432	75	50	-	557	100	25	25	-	150
Bonga	6	9	38	-	53	690	50	27	-	767	118	22	10	-	150
Hamancho	4	21	29	-	54	530	200	77	-	807	87	41	32	-	160
Q.Kombola	5	14	33	-	52	210	40	20	-	270	105	55	13	-	173
Ambaricho	8	16	33	-	57	163	70	30	-	263	116	25	6	-	147
Geremba	10	19	20	-	49	590	89	40	-	719	129	10	9	-	148
G.Gerba	9	14	17	-	40	340	71	40	-	451	70	50	20	-	140
Hego	5	17	20	-	42	728	320	80	-	1128	119	30	13	-	162
Wondo	7	18	20	-	45	470	65	40	-	575	130	43	8	-	181
Yebu	6	21	29	-	56	962	190	53	-	1205	110	45	10	-	165
H.Dato	6	10	15	20	51	790	185	50	50	1075	140	10	3	7	160
Kazala	11	19	20	-	50	460	70	36	-	566	98	53	12	-	163
Gonji	9	20	30	-	59	340	175	100	-	615	102	55	6	-	163
Damboya 01	6	12	-	-	18	490	199	-	-	689	503	100	-	-	603
Damboya 02	4	16	-	-	20	560	347	-	-	907	398	195	-	-	593
Funxo	3	13	-	-	16	102	80	-	-	182	110	83	-	-	193
Total	124	295	437	20	876	8294	2518	779	50	11641	3027	1062	270	7	4366
Percentage	0.7	1.75	2.6	0.1	5.2	49.1	14.9	4.6	0.3	68.95	17.9	6.3	1.56	0.01	25.9

Source: Damboya Woreda Educational Office and School Directors' Office (2022).

CHAPTER FIVE

5 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

The study investigated the spatial distribution of primary schools, spatial accessibility of primary schools to students and effects of spatial distribution of primary schools on students' academic performance in Damboya Woreda, Kembata Tembaro Zone, SNNPR of Ethiopia.

The analysis of spatial distribution of primary schools in terms of population number indicated that the allocation of schools with relatively more number of population such as Yebu*Kebele* and Damboya02 are served with more than areas of low population density (*Kebele*Funxo,wondo). However, there is uneven allocation as some areas with denser population are not allocated with more for instance, Damboya02. This indicated that the population and primary schools are not evenly distributed. Location Quotient values varies between 4.9 in Funxo Kebele and 0.3 in Damboya 01 Kebele. This indicated that the disparity of location of schools in the study area. The ratio of schools to population is 1:4960 at the woreda level, while at the kebele level the highest school to population ratio is found in Damboya 01 kebele (1: 14827), however, the lowest is in Funxo Kebele (1:1009).

The result of spatial accessibility of primary schools to students' revealed that a significant number of students' have little access to primary schools in the study area. About 11823(64.8%) of students travel above 2km to access the schools.

Distance of schools locations affects students' academic performance negatively. About 81.7% of students that travel above 2kms to access the school constitute 81.7% of dropout of schools from the school and 752(86%) of them scored below 50%.

5.2 Conclusion

The study assessed the spatial distribution of schools, accessibility to the students' and its effects on students' academic performance in Damboya Woreda Kembata Tembaro Zone SNNPR of Ethiopia. The study indicated that the spatial distribution of schools is not considering population number. This indicated that the inaccessibility of schools in the study area. Some Kebeles are accessed well, while the others kebeles lack of access of schools. Due to this large number of

students in the study are forced to travel more than 2kms to access the schools. Inaccessibility of schools affects students' academic performance. When students travel above 2kms to access the schools resulted dropout of students' from the school and minimization their score. Generally the study concluded that spatial distribution of schools in the study area is uneven, inaccessible and it affects students' academic achievements negatively.

5.3 Recommendations

This study suggests further research on the spatial distribution of primary schools, spatial accessibility of primary schools to the students and the effects of spatial distribution of schools on students' academic performance.

The study recommended there was a need of planners and government intervention in the provision of primary schools in deficient Kebeles to enhance human development, to avoid the negative effects of school distance on students and to ensure equity, equality, quality and accessibility of primary schools in the study area.

Based on the findings of this study the researcher has recommended the following key points

- The need for spatial distribution maintenance should be part of the orientation programme given to students, teachers and administrators in the educational system.
- Educational planners, parents, government and philanthropists must see to the well-being of the school because the output of the school system determines the future of the societies.
- Institutional building for expanding primary school has to be raised as one of the most unprotected and conserved part of enhancing learning resources/facilities in the study area. In this respect, it is being recognized that there is a need for improved understanding and identification of institutional and organizational arrangements required for effective construction of primary schools.
- An appropriate legislative framework to support primary school laws has been also raised as an important tool which needs particular attention to address shortage of primary schools and to protect the existed primary schools from destruction and lose in each kebele of the study area.

- Providing of better educational access for students enhance their academic performance and it can be increasingly seen as an appropriate vehicle not only for economic, social and environmental change but also for the improvement of living conditions of rural communities. In this regard, there is a need for long-term commitment, including financial aid, from all stakeholders.

- A detailed research survey is needed before onset of the spatial distribution of primary schools at the village level to understand and document the impact of unbalanced distribution.

- The government and all stakeholders must give necessary financial and professional support to the secondary schools toward ensuring good spatial distribution planning. This will facilitate good effectiveness of the students.
- The relatively high level of spatial distribution planning and students' academic performance in primary schools should be improved upon by the school administrators and other stakeholders.

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