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MASTER THESIS

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MASTER'S THESIS

IMPACT OF DEMOGRAPHIC CHANGES ON PUBLIC EDUCATION A CASE OF PRIMARY EDUCATION IN THE SARAJEVO CANTON

Ljubljana, March 2016 MUAMER ĐUZO

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INTRODUCTION

The changes in the demographic structure of the population (monitoring trends of natality and mortality) are of great importance for the formation of policies of public education. Primary school education in the area of the Sarajevo Canton is carried out in 85 institutions, according to the available data for the school year 2012/2013. Primary education in the Sarajevo Canton is mandatory for every child that turns 6 years of age in the month of April in the calendar year. The selection of the elementary school in which a child, is to be enrolled as a student is left to the will of the parents. A student may be enrolled in the first grade of primary education in any of the 85 primary schools in the Canton of Sarajevo, whether it be a public or a private institution. In this way, there is thought latent a growing competition between public and private schools, as well as between students enrolled in public and those enrolled in private schools and their performances. Primary education lasts without interruption for 9 school years.

In this study, changes in the demographic structure in the Sarajevo Canton will be followed in the period from 1997 to 2013 for the natality, mortality, and natural increase of the population in municipalities. The war between 1991 and 1995 had a significant impact on the movement of the demographic parameters. The changes of the listed paremeters resulted from the changes in the age and ethnic structure of the municipalities of Stari Grad, Centar, Novo Sarajevo and; changes in the administrative boundaries of the city of Sarajevo; and the formation of the Sarajevo Canton. The geographical location of the city of Sarajevo, the Sarajevo Canton is one of the reasons for the large fluctuations in the movement of natality , mortality and natural growth by the municipalities in the given time period. In parallel with the changes in the demographic structure of the population (natality, mortality, and natural growth) we shall follow the movement of the number of primary schools, the number of classes, teachers and students by municipalities for the school years 2001/2002, 2005/2006, 2010/2011, and 2012/2013. Pedagogical standards for primary education of the Federation of Bosnia and Herzegovina that are valid and applicable in the territory of the Sarajevo Canton will be taken into account.

The following norms and standards shall be analysed in detail: optimal number of classes in a school, the optimal number of students in one class, and area of usable space per student. An analysis shall be conducted on the basis of the norms and standards, showing the current state of how public primary schools comply with these norms and standards. In order to present the current state of primary education in the Canton of Sarajevo, I shall present certain indicators that are valid for the OECD countries, based on which it will be shown to what extent the primary education in Canton Sarajevo is away from these indicators. The purpose of the teaching of norms and standards which are valid for primary education is compliance with those norms.

The primary objective of the study is to analyze natality trends and its relevance to primary education policy planning. The recent dramatic changes in the demographic structure of the population in Bosnia and Herzegovina, including Sarajevo Canton are to be taken seriously into account when drafting the policies of public education. Further, in line with the much needed assessment of the quality of primary education provided in BiH, this study aims to shed some light on this complex and multidimensional issue, by determining the extent to which the existing pedagogical standards and norms are applied in the territory of the Sarajevo Canton. Finally, an attempt is made to propose specific measures on how to meet the minimum of those (selected) standards and norms.

The objectives of this thesis will be to:

1. provide a review of the basic parameters of the vital demographic statistics by municipalities for the period from 1996 to 2013,
2. provide a review of all primary schools in the area of the Sarajevo Canton,
3. analyze the relationship between the number of students enrolled in the first grade compared to the birth rate,
4. analyze the usable space per student for all primary schools,
5. construct a proposal for restructuring the existing primary schools in the area of the Sarajevo Canton with respect to the usable area per student (the possibility of building the new facilities for primary education; maximization of space in schools where this is not done),
6. give a proposal to restructure the existing primary schools in line with demographic trends.

Master's thesis is structured into four chapters and a conclusion. The first chapter presents the theoretical introduction to demography as a discipline, sources of demographic data, data on vital demographic statistics of the population (natality, mortality, and natural growth), and the structure of the population by sex and age. The second chapter presents the institutional structure of the education sector in Bosnia and Herzegovina. The institutional structure of the education sector in Bosnia and Herzegovina is complex, and represents the image of the territorial organization of Bosnia and Herzegovina. Institutional image of the education sector in Bosnia and Herzegovina is defined by the Constitution of Bosnia and Herzegovina, the constitution of its entities, cantons in the area of the Federation of B&H and the Statute of the Brcko District. In Bosnia and Herzegovina education is organized into four levels: pre-school education, primary education, secondary education, and higher education. At the end of chapter two we are introduced to the regulation of primary education in the area of the Sarajevo Canton. The third chapter presents the geographical position of the Sarajevo Canton, accompanied by changes in the administrative boundaries of the city of Sarajevo in the period 1978-2009, and the emergence of the Sarajevo Canton and its territorial organization.

Moreover, this chapter presents the movement of the total population, population density, and population growth in the period 1996-2013. On the basis of secondary data on natality and mortality, the birth rate by municipalities will be calculated. The fourth chapter presents the current situation in primary education in the area of theSarajevo Canton regarding the number of students, classes, teaching staff

For the purpose of the analysis in the fourth chapter, we shall take into consideration 3 standards/norms for primary education of the Federation of Bosnia and Herzegovina that are valid and applicable on the territory of the Sarajevo Canton, and these are: the optimal number of classes in a school, the optimal number of students in one class, and area of usable space per student. In order to present the current state of primary education in the Canton of Sarajevo, certain indicators shall be presented that are valid for the OECD countries, based on which it will be shown how primary education in Canton Sarajevo is far from aforementioned indicators. At the end of the fourth chapter a proposition is given on how primary schools in the Sarajevo Canton can meet those standards. The last part of the thesis refers to a conclusion which provides recommendations that, when planning policies, standards and norms that apply to primary education, certain factors should be taken into account, such as: changes in the demographic structure of the population (natality and mortality), parents' choice about primary school in which the a child is to be enrolled, and evergrowing rivalry between private and public primary schools.

1 CONCEPT AND DEFINITION OF DEMOGRAPHY

Demography as a scientific discipline started to develop in the study of natural population growth, especially in the study of the rules portraying mortality changes. The word demography comes from two Greek words (*demos*=people, *graphiem*=to write, to describe it), first introduced in literature by French statistician Achille Guillard. Demography developed as a separate scientific discipline in the late 19th and early 20th century, when the interest in the expansion of the population became larger. "In the broadest sense of the term, demography refers to the study of the population from the quantitative and qualitative aspects" (Wertheimer, 1999, p. 41).

"Demography is the social science that studies 1) the size, composition, and distribution of the human population of a given area at a specific point in time; 2) changes in population size and composition; 3) the components of these changes (fertility, mortality, and migration); 4) the factors that affect these components; and 5) the consequences of changes in population size, composition, and distribution, or in the components themselves (Poston & Bouvier, 2010, p. 3).

Demography as a scientific discipline can be defined in a narrow and a broad sense. At the beginning, demography was defined in the narrow sense and its subject was a natural and mechanical movement of the population.

“Demography is defined as a social science that explores the principles of population development in their social and economic conditionality“ (Breznik, 1988, p. 26). “Demography is the mathematical study of size, composition and special distribution of human population and of changes overtime in these aspects through operation of the five processes of fertility, mortality, marriage, migration and social mobility” (Sharma, 2004, p. 8).

“Demography is the scientific study of human population, or more specifically, the study of the size, geographic distribution, age-sex structure, and socioeconomic composition of population and factors that affect changes in these dimensions of population namely, fertility, mortality, marriage, migration” (Shryock, 1975, p. 2).

1.1 Basic units in the population study

Basic units in the study population were:

1. a person or a resident,
2. family or household,
3. settlement

These are also the basic units of vital demographic statistics. The term person primarily refers to a person residing in a particular geographic territory. In demographic vocabulary, this primarily refers to a live-born child or a deceased person.

Family and household are complex statistical units, which include a set of persons living in the same space (apartment or house) and feeding together. The family is different from the household on the basis of members’ kinship.

The term settlement is applied for each set of buildings, regardless of their number, from the smallest villages to the cities of various sizes.

1.1.1 Subject of demographics and demographic methods

In terms of the chronological development, demographics can be seen in a narrow and a broad sense. Understanding demographics in the narrow sense is identified with the demographic statistics. The subject of demographics in the narrow sense refers to the size and spatial distribution of population, natural and mechanical movement, as well as gender and age structure of the population (Wertheimer, 1999, p. 42).The focus of demography in the narrow sense is the natural change in population, i.e. natality and mortality. The main disadvantage of demography in the narrow sense is the lack of interaction between population dynamics and social and economic changes.

The subject of demographics in a broader sense is the study of the number and the spatial distribution of population, natural and mechanical movement of the population and changes in demographic, socio - economic and other structures of the population (Breznik, 1988, p. 30). The subject of demographics in the broader sense can be associated with the term of demographic development.

The demographic development is a complex process of development of the population, which includes natural and mechanical movement of the population, mutual interaction with economic, social, socio - psychological factors which are directly aimed at developing population (Wertheimer, 1999, p. 43).

Demographic development implies continuous research of causal links between population changes, changes in its structure on the one hand and socio - economic development on the other (Sharma, 2007, p. 10). The scope of demography has been classified into two sections: Macro-demography and Micro-demography. Micro-demography is the study of the growth, distribution and redistribution of population within a community, state or local area. Macro-demography implies natural and mechanical movement of the population and its interaction with the changes in the socio - economic structure (Sharma, 2007, p. 11). The basic elements of macro-demography are:

1. size of population,
2. organization of population,
3. population distribution,
4. fertility and Mortality,
5. migrations,
6. labor force and
7. population policy.

Population development is a concept that involves the quantification of certain demographic phenomena and processes that are related to the population of a certain geographical area. **Demographic development** is a general relationship between demographic and socioeconomic factors, while the development of the population implies a specific demographic analysis of a specific geographical area.

1.1.2 Sources of the population data

"The data on population are essential for Demographic Studies. There are five key sources of data on the population"(Wertheimer, 1999, p. 43):

1. census (census books),
2. books of vital demographic statistics,
3. specific statistical publications on various relevant population sets,
4. surveys on population, and
5. various administrative and other registers.

"The basic sources of demographic data are national census, registers and surveys" (Poston & Bouvier, 2010, p. 15). National censuses and registers differ in that the former are conducted decennially. Registration data of population events are usually compiled and published annually or monthly. Censuses are the main source of data on population and its territorial arrangement. The oldest written record of a census dates back to 2000 BC in China. The modern Census dates back to 1749 when the first census of the population of Sweden was taken.

The scientific methodology of the census was developed in 1846 during the census of Belgium. Population census on the territory of Yugoslavia dates back to the 1921. Historically, the census of Yugoslavia can be observed in two periods: until World War II and after. Two censuses were taken in the period before World War II, namely in 1921 and 1931, and after World War II in 1953, 1961, 1971, 1981, 1991. According to data from 1991, there were **4,377,033 inhabitants** in Bosnia and Herzegovina. The first postwar census in Bosnia and Herzegovina was taken in the period from 15/10/2013 until 15/11/2013. Modern censuses have several important features (Breznik, 1988, p. 26):

1. the census generally includes the entire population of a territory,
2. the census obtains data directly from the population,
3. the census provides an extensive review of the population data and its features, which relate to a particular moment,
4. the census refers to a specific moment in time, and the instructions of the census determine the time of the census taking,
5. the census is taken every ten years, which expresses its periodicity.

A typical census includes information about the size of the population, as well as the data on geographic subpopulations, data on their age and sex composition and educational composition. “There are two ways to count people: by de jure method or by following a de facto method” (Poston & Bouvier, 2010, p. 16). A census de jure records all the persons within a territory in their usual place of residence in the country.

The basic data on vital demographic changes are provided in the books of vital demographic statistics. Under vital demographic changes the following events are implied: birth, marriage, death. The books of vital demographic statistics represent the system of current statistics that imply continuous monitoring of data on these vital events for the total population. Unfortunately, certain underdeveloped and developing countries do not have good records of vital demographic changes. UNICEF estimated that in 2000, 50 million newborns remained unregistered, which represents 2/5 of the total number of newborns in 2000.

Population surveys are a valuable source of data on certain groups of the population, or households (Poston & Bouvier, 2010, p. 36). The most prominent forms of population surveys are:

1. world Fertility Surveys,
2. demographic and Health Surveys,
3. other fertility surveys,
4. current Population Surveys,
5. national Survey of Family Growth.

World Fertility Surveys were first conducted in 1970. From 1974 to 1986, data on the reproductive cycle of women, socio-economic status and psychological factors that affect female fertility were taken. The survey encompassed women in 62 countries that make up 40% of the world's population.

Demographic and Health Survey has been carried out since 1984 in 75 developed countries. Survey is conducted on a sample of 5,000 to 30,000 households and provides information in the field of fertility, population, health and nutrition. The survey is conducted every 5 years with the purpose of comparison. Current Population Survey is a nationwide survey conducted by the US Census Bureau. Its main purpose is collecting labor force data about the civilian non-institutional population.

National Survey of Family Growth was conducted in 2002 in the six-month cycle survey. This survey includes both men and women aged 15 to 44 years and gathers information about the family and reproductive health. The first survey covered 12,571 people in the US; 7,643 women and 4,928 men (Poston & Bouvier, 2010, p. 36).

Population registers are the oldest source of demographic data. They primarily keep the record of information about the births, deaths, marriage, military service, the number of working-age population, etc.

1.1.3 Demography and Economy

The interest of economists in demography and demographic changes was first shown in the 1930s during the Great Depression. The interest first began to awaken in developed countries and then in developing countries. There are four crucial areas of cooperation between economists and demographers (Wertheimer, 1999, p. 58):

1. workforce issues,
2. supply and demand issues,
3. tax policy and investment policy,
4. synthesis of economic policy and demographic development.

Workforce issues are the key factor in the production process. The size of the workforce depends on demographic trends, primarily natality and mortality changes, and the structure of the labor force by sex and age.
The supply and demand issues apply to the determination of the required amount and the assortment of food for a country, the size of the stock, the number of educational institutions, the size and structure of the health sector, social welfare.

Tax policy and investment policy is the third area of common interest between demographers and economists. The number of tax payers depends on the income and the age structure of the population. The size of taxes, for instance, may depend on the number of children in the family, while the level of savings, investment and consumption depends on the tax rate.

The last area of joint cooperation of economics and demographics is reflected in the synthesis of the results obtained on the basis of the above issues with the aim of defining economic policy.

1.1.4 Total population

We have already defined that the most accurate portrayal of the population is given by the "Census". "There are two basic definitions of the total population, the first is based on the concept of permanent (residential) population and the other on the concept of present population" (Siegel, 2002, p. 40).

Permanent population of an area are considered to be those persons who had permanent residence on that area regardless of whether or not they were present at the time of the census, (Wertheimer, 1999, p. 195).

This definition implies that each person must be censused in their area of residence, regardless of whether they were present or absent on the day of the census. Education, travel, medical treatment, etc., are stated as the most common reasons for absence from the place of residence.

The present population in one territory is considered to be those persons who, at the time of the census, were present on the territory, regardless of whether they have a permanent residence or not (Poston & Bouvier, 2010, p. 40). The total permanent population of one area (P_t) at the time of the census is obtained from the following three groups (Wertheimer, 1999, p. 196):

- permanently present population (P_{pp}),
- temporarily absent persons (P_{ta}),
- temporarily present persons (P_{tp}).

$$P_t = P_{pp} + P_{ta} - P_{tp} \tag{1}$$

Total population change occurs as a result of various factors, such as births, deaths, immigration and emigration (Wertheimer, 1999, p. 197).

$$P_t = f(N, M, I, E)_t \tag{2}$$

where we have:

- P_t- *total population at the moment of census in the time "t",*
- N- *total of live-born children in the time "t",*
- M- *total of deceased persons in the time "t"*,
- I- *total of immigrants in the time "t"*,
- E- *total of emigrants in the time "t"*.

The difference between the total population of two censuses can be observed in absolute and relative terms. The simplest indicator from the first group is intercensal change in population size "D", which indicates the overall absolute amount of change occurring between the two censuses (Wertheimer, 1999, p. 198):

$$D = P_2 - P_1 \text{ or } D_1 = P_3 - P_2 \tag{3}$$

The disadvantage of this indicator is that it does not show the total population from which the annual increase emerged. Obviously, larger population will have higher annual growth rate of the population and vice versa.

The change in population between the two censuses is calculated by the total change rate (increase or decrease), which is denoted by "r" (Wertheimer, 1999, p. 198).

$$r = \frac{p_2 - p_1}{p_1} = \frac{D}{p_1} * 100 \tag{4}$$

The average annual change in the population is part of the relative indicators of the change in population between the two censuses, and is indicated by $\bar{r}$

$$\bar{r} = \frac{\overline{R}}{p} * 100, P = \frac{P_1 + P_2}{2} \tag{5}$$

Total population change consists of natural and mechanical movement of population (Breznik, 1988, p. 55).

1.2 Vital characteristics of the population

1.2.1 Natality, fertility and its determinants, indicators of fertility

Fertility can be studied in different ways. One way is cross-sectionally, that is at one point of time, also known as a period perspective. Birth rate - fertility is a positive item in the natural population growth which, along with other unchanged conditions, affects the population growth (Wertheimer, 1999, p. 198). In demographic literature, the term fertility refers to the ability to produce offspring.
Fertility may be studied over time to give us measures revealing the number and spacing of births to cohorts of women as they pass through the life cycle; this is known as cohort analysis (Poston & Bouvier, 2010, p. 40). Demographic study of fertility of individual women and men is known as a micro-analysis of fertility, because it is related to one person.

There are several ways of studying natality – fertility (Poston & Bouvier, 2010, p. 40):

1. examining the number of births a woman, or man, has produced by a given point in the time,
2. examining the number of births a woman, or man, has had by the end of the childbearing years and
3. focusing on the timing and spacing of births at various stages of the life cycle.

The term natality and fertility imply the quantitative processes that are directly related to the process of the birth of children in the total population in a certain geographical territory. The term natality is associated with the notion of effective natality or fertility that includes the number of live births, while the total number of births (live births and stillbirths) indicates the overall concept of total natality or total fertility.

"The natural fertility indicates the level of fertility that can be achieved with the absence of constraints involved in birth, i.e. a married couple is not trying to limit the number of births before the end of the fertile period of a woman (Henry, 1961, p. 1961)". In contrast to the natural fertility there is also the controlled fertility, which indicates the level of fertility achieved by family planning and the use of medical resources for birth control. The concepts natality and fertility should be considered in their narrow sense respectively, where **the term natality** indicates the number of live births in the total population, and **the term fertility** indicates the total number of live births in relation to a woman's fertile period. Fertile period of women is between 15-49 years, while in case of men it is between 15-64 years (Wertheimer, 1999, p. 209). The term fecundity implies potential fertility or ability of a couple to participate in the process of reproduction of the population.

The level of natality (fertility) is determined by the level fecundity on the one hand, and all those factors which directly or indirectly cause the reduction of fecundity below the maximum on the other.

The level of fertility is below the level of fecundity in all societies. In underdeveloped countries and communities the fertility level is very high and close to the level of fecundity, while this process is reversed in developed countries. There are three key groups of factors that determine the level of fertility (Breznik, 1988, p. 55):

1. biological factors,
2. socio-economic factors, and
3. psychological factors.

Biological factors in fertility levels had a significant impact in the early stages of population development. Their influence is stronger in underdeveloped countries and developing countries. With the development of society their influence is decreasing, while the influence of socio - economic and psychological factors is increasing.
Biological determinants of fertility are: fecundity, the age structure of the population and the average marrying age.

Socio - economic factors of fertility are directly related to the biological and particularly psychological factors of fertility. The main socio-economic determinants of fertility are: level of economic development and urbanization process, the social functions of the family and the material conditions for the establishment of new families, the role of children in the family and the costs of maintenance, social and economic status of women and the level of general education of women.

The third group of factors that determine fertility levels are ***psychological factors***. Their influence on fertility is extremely complex because to a large extent it depends on the socio - economic, individual factors and the life of the individual. The strength of these factors is extremely high. In this group we have:

1. socio-psychological factors and
2. psychological features of individuals.

There are two main natality – fertility rates: periodic and cohort (Wertheimer, 1999, p. 222). Periodic rates are calculated for a specific time period, usually a time period of one year, while cohort rates study reproductive experience of a generation in a period of time.

The most common indicators of natality are: natality rate, fertility rate, net production rate (Breznik, 1988, p. 60). The simplest and the roughest indicator of the frequency of birth of the population is the natality rate.

It represents the total number of births in one year (live births + stillbirths of children) at the mid-year.

$$n_u = \frac{N_u}{p} * 1000 \tag{6}$$

where we have:

- n_u – *general natality rate,*
- N_u – *total births (liveborn + stillborn),*
- P – *total population at the mid-year.*

1.2.2 Mortality and its determinants, indicators of mortality

(Wertheimer, 1999, p. 236) Mortality is the negative component of natural and total population change. The process of aging and death is a continuous process, which in itself brings a need for quantitative and qualitative replacement of deceased with new generations. The process of replacing the deceased with new generations often leads to radical changes in the socio - economic structure of the population. The complex action of biological, socio - economic and health factors affects the overall mortality, which is an important indicator of living standards.

There are two key sets of factors that determine the level of mortality (Wertheimer, 1999, p. 238):

1. biological factors and
2. socio - economic factors.

The age structure of the population is the key factor that affects the level of mortality. The health status of the individual, the development of general and social medicine, and the influence on the prevention of specific diseases have contributed to the prolongation of human life.

The standard of living, level of education of the population, hygienic - sanitary conditions and health conditions of life (level of health services, the number and structure of medical staff) are the main socio - economic factors of mortality (Poston & Bouvier, 2010, p. 110). The main socio - economic factors that have led to a reduction in mortality of the population were (Wertheimer, 1999, p. 239):

1. eliminating hunger and food shortages,
2. the impact of economic growth and an increase in GDP per capita,
3. the impact of various social reforms,
4. the impact of increasing general education,
5. the impact of improving sanitary conditions of housing and personal hygiene of individuals.

Measuring the level of mortality dates back to John Graunt and his analysis of "Bills of Mortality". Mortality refers to the relative frequency of death in the population (Poston & Bouvier, 2010, p. 110).
Demographers use two different concepts when referring to mortality, namely, the life span – which is a numerical "age limit of human life", and life expectation which is the average expected number of years to be lived by the particular population. Crude death rate (CDR) is an easily understood method of quantifying mortality in one population. CDR is the number of deaths in a population in one year per one thousand members of population (Poston & Bouvier, 2010, p. 111).

$$CDR = \frac{deaths\ in\ the\ year}{population\ at\ the\ midyear} * 1.000 \tag{7}$$

The above formula can be written as follows, if the numerator is written as follows (Breznik, 1988, p. 60).:

$$death \text{ in the year} = M = \sum_{n}^{t} M_x = \sum (P_x * m_x) \tag{8}$$

Where n=0, and t=100 year, denominator is replaced with expression:

$$population\ at\ the\ midyear\ P = \sum_{u}^{t} P_x$$

then the formula of general mortality rate is:

$$m = \frac{\sum (P_x * m_x)}{\sum P_x} \tag{9}$$

Where we have:

- P_x - *total population (by age group x),*
- m_x - *specific mortality rates of the total population by age (x),*
- $(P_x * m_x)$ - *the total number of deaths in terms of action* m_x.

The advantage of this type of mortality rates is reflected in the fact that it shows the determinants of total number of deaths according to a specific rate. The general mortality rate was extremely high in underdeveloped countries and, on average, it was above 40 deceased persons per 1000 inhabitants. General mortality rate is a good indicator of the development of mortality in one area in a short period of time; however, it is not a reliable indicator of the level of mortality in comparative analysis. There are two typical cases to prove this:
1. The general mortality rate is a good indicator of the level of mortality if the compared areas are significantly different according to the level of socio - economic development.
2. The general mortality rate is not a good indicator of the level of mortality for comparative analysis.

1.3 The structure of the population by age and sex

The population is not homogeneous; neither statistically nor content-wise. The word *structure* points to the different features in individuals who are residents of one area or of a country. The population of an area differs by various factors, of which the most prominent are: gender, age, marital status, activity, qualifications, etc. The population is a specific set of individuals, where each takes part with a lot of personal characteristics (Breznik, 1988, p. 90).

The most common are the three partial structures of the population (Wertheimer, 1999, p. 335):

1. biological structure (by sex, fertility, marital status)
2. the economic - social structure (according to economic activity, occupation, position in the community and ethnic structure)
3. educational structure (according to literacy, educational attainment and other educational features).

1.3.1 The structure of the population by sex

The structure of the population by sex shows the numeric ratio of male - female population in the total population (Breznik, 1988, p. 95). Demographically speaking, population structure by sex varies depending on the social and economic situation in the country, and these differences are especially evident in developing countries when compared to developed countries. Basic indicators of population structure according to sex can be divided into two groups:

- masculinity coefficient k_m
- femininity coefficient k_f.

Masculinity coefficient expresses the number of men per 1,000 women, or vice versa, femininity coefficient expresses the number of women per 1,000 men.

$$k_m = \frac{P_m}{P_f} * 1000 \; k_f = \frac{P_f}{P_m} * 1000 \qquad (10)$$

where we have: P_f – number of female population, a P_m – number of male population.

Masculinity / femininity coefficient can be between > 1000, <1000, or = 1000. If the coefficient is equal to 1000 it indicates that there is a balance between male and female population in the observed population. If the masculinity coefficient is more than 1000 this means that there more men than women, and vice versa, if the masculinity coefficient is less than 1000, there is more female population in the observed population.

1.3.2 The structure of the population by age

One of the most important structures for the development of the population according to their socio - economic implications is the structure of the population by age. The age structure of the population gives us an image of the historical development of the population over a long period of time. Age of the population is generally defined either by the years of age or by the calendar years. The structure of the population by age is a division of the total population in a census by one-year or five-year age groups.

There are various criteria for dividing the population by age. If we explore the impact of the age structure on the fertility of the female population, then the female population can be divided into the following three major groups: 0-14 prefertile age, fertile age of 15-49 and postfertile age of 50 and over. If we analyze the working contingent and potential labor resources, the total population can be divided into three major age groups: 0-14 pre-working contingent, 15-60/15-65 working contingent of women and men, 60/65 and older post working age for women and men respectively.

Age limits for certain functional groups vary from country to country. They are predetermined by physiological capabilities of performing certain functions. The guidelines of the age structure of the population are: natality (fertility), mortality, migration of population, external economic and political and other factors (Breznik, 1988, p. 75).

The most important determinant of the age structure of the population is the natality rate. High natality (fertility) regularly indicates a young age structure of the population, which is directly related to increased labor contingent, while low natality indicates a high proportion of middle-aged and old people in the population. The influence of mortality on the age structure of the population is significantly lower than the fertility rate, although natality and fertility jointly determine the number of people in different age groups.

The age structure of the population is formed under the influence of fertility and mortality and under the influence of migration processes. Migratory movements cause disorders in the age-sex structure of the population. Immigration of population causes a positive effect on the age structure of the population, because it usually increases the number of the population of the ages from 20 to 40. Unlike immigration, emigration has a negative impact on the age structure of the population. Most often it leads to a reduction of the population aged 20 to 40. The effects of population migration can be observed in the short term and in the long term. Short-term effects are the reduction of workforce, increasing the burden on working population and reducing the fertile contingent. Long-term effects of migration are lower natality and the number of births, and reducing the inflow of new generations in the working contingent.

2 PUBLIC EDUCATION IN BOSNIA AND HERCEGOVINA

The education sector in Bosnia and Herzegovina reflects the state system defined by the Constitutions of Bosnia and Herzegovina and its entities and the Brčko District legislation. The Ministry of Civil Affairs of Bosnia and Herzegovina is responsible for performing the tasks which are under the jurisdiction of Bosnia and Herzegovina and relate to the field of education, and coordination of activities at the entity level.

The Federal Ministry of Education and Science performs administrative, professional and other tasks relating to the coordination and planning of activities in the areas of: preschool, primary, secondary and higher education, pedagogical standards, and the space norms of preschool, primary, secondary and higher education.

Four framework laws on education are adopted at the level of Bosnia and Herzegovina:

1. framework Law on Higher Education in Bosnia and Herzegovina,
2. framework law on Preschool Education in Bosnia and Herzegovina,
3. framework Law on Vocational Education and Training in Bosnia and Herzegovina, and
4. framework Law on Primary and Secondary Education in Bosnia and Herzegovina.

All laws at the levels of the Federation of Bosnia and Herzegovina, Republika Srpska and the Brčko District along with other regulations in the field of education should be adjusted in line with the four Framework Laws. At the state level, the following agencies have been established: the Agency for Development of Higher Education and Quality Assurance, the Centre for Information and Recognition of Qualifications in Higher Education and the Agency for Preschool, Primary and Secondary Education.

2.1 Levels of education in Bosnia and Herzegovina

In Bosnia and Herzegovina, the process of education is organized into four basic levels, namely:

1 preschool education,
2. primary education,
3. secondary education and
4. higher education.

Preschool education in B&H is an integral part of educational system. It is the first special and specific level of education in the upbringing of preschool children. This level of education must be viewed as a level of education which is based on care and protection. A year before starting primary school is obligatory for all children of preschool age.

Primary education is defined by the Framework Law on Primary and Secondary Education. Primary education is compulsory for all children. It starts in the calendar year in which by April 1 the child reaches six years of age, and it continues, without cessation, throughout the period that may not be shorter than nine years. In the Federation of Bosnia and Herzegovina, the process of introduction of nine-year primary education was completed in the school year 2009/2010, while in the Republika Srpska this process was completed in the school year 2003/2004. According to the Framework Law, the compulsory education is free and is provided for all children. Unfortunately, due to the poor financial situation faced by the entities, the option of free education which is reflected through the distribution of free textbooks is not possible for every child. Only the Brčko District complies fully with these decisions, while at the entity level, this decision is implemented partially i.e. only for children living in low-income families.

Secondary education is defined by the Framework Law on Primary and Secondary Education in B&H, and it is available to everyone, depending on the general success achieved in primary school and the results of external graduation at the end of the nine-year education. There are two types of secondary schools: general and vocational schools. In these schools classes are held according to the curriculum for four-year education after which students are given a diploma of secondary education level and the ability to continue their education.

Higher education is defined by the Framework Law on Higher Education in B&H and implemented by the completion of four-year education in Bosnia and Herzegovina. In order to enroll a higher education institution in B&H, students who have completed secondary school abroad, submit the proof of completion of secondary school (certificate or diploma) for evaluation to the relevant institution, which deals with the verification of foreign diplomas.

The criteria for enrolment into a higher education institution are defined by the decision of the University Senate upon the proposal of the Academic Council of the Faculty. Higher education in Bosnia and Herzegovina is organized in three cycles:

1. the first cycle leads to the academic title of completed graduate study or equivalent to 180 or 240 ECTS credits.
2. the second cycle leads to the master's degree or equivalent, which is valued with 60 or 120 ECTS credits so that the total of the first and the second cycle is 300 ECTS credits.
3. the third cycle leading to the academic title Doctor of Science or equivalent.

2.2 Public education in Sarajevo Canton

Primary education in the Sarajevo Canton is regulated by the law on Elementary education. This law defines the principles of primary education for students with normal psychological development and students with special needs (the hearing impaired, blind, visually impaired, people with difficulties in their mental development), which is realized in institutions of primary education. The institution for primary education is a primary school which can be regular, parallel, (primary music, primary ballet school) and special primary schools. In the Sarajevo Canton it is necessary to attend primary school for a period of nine years and is for children from six to fifteen years of age. A first grade student is considered every child who is to turn 6 years of age by 1 April. Primary school that has adequate space and staffing opportunities may with the prior approval of the Ministry of Education and Science of the Sarajevo Canton, allow a child under the proscriber age to start compulsory education enrollment in a school if parents or guardians of the child ask for that, and if the school, after considering the recommendation of relevant experts, is sure that it is in the best interests of the child. A person older than 15 who does not attend regular primary school (adult) can acquire basic education in accordance with this Law and in accordance with the curriculum for adults set by the Agency for Curricula.
Classes in the Sarajevo Canton are performed in the languages of the constituent peoples of Bosnia and Herzegovina called by one of three names: Bosnian, Croatian or Serbian. Classes are held in both scripts (Latin and Cyrillic), and by the end of the third year of primary school, students will have learnt both scripts.
Primary school as an institution in the area of the Sarajevo Canton may be establish by a domestic or foreign legal person with the approval of the Minister and with the prior consent of the Government of the Canton. Primary school as a public institution may be established by the Canton alone or with other legal or natural persons when Canton evaluates that its establishment is of public interest. The establishment of primary schools is planned in accordance with the concept of primary education and in accordance with long-term development program put forward by the Canton at the proposal of the municipality or other legal entity.

The founder of the school in the Sarajevo Canton provides the means necessary for the establishment and operation of school in accordance with pedagogical standards for primary education and norms of school space, equipment and teaching aids.

The establishment of public primary school is possible if there is a sufficient number of students for the formation of at least 18 classes for a regular school. The school year runs from 1 September of the current year to 31 August of the following year. Teaching in schools is conducted in two terms and lasts 37 weeks; however, the curriculum is planned and implemented in the course of 35 working weeks.

The educational process in a primary school carried out the by a teacher. Teacher is a person qualified to perform educational work with children and adults, has a broad general education, possesse a profound knowledge of the subject they teach, and also has the knowledge of psychological-pedagogical and methodical basics of teaching and education. The primary goal of a teacher is education of students by modern pedagogical criteria in the framework of the established curriculum.

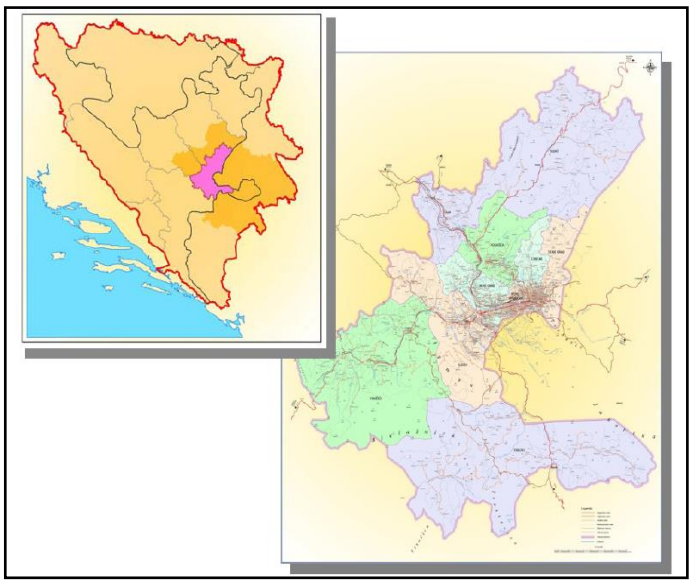
Depending on the type of primary school, the corresponding profile and qualifications of primary school teachers and specialized teachers is determined. A primary school teacher conducts classes from first to fourth grade has a higher education degree. A specialized teacher / subject teacher conducts classes from fifth to ninth grade has a higher education degree.

3 POPULATION, POPULATION DENSITY AND VITAL DATA

3.1 Geographic and geopolitical location of the Sarajevo Canton

The Sarajevo Canton is located in the mountain range of the Dinarides, at the contact of the two large natural-geographic units: the Danube and the Adriatic Sea. The Sarajevo Canton covers an area of 1,268.5 km^2, which is 2.5% of the territory of Bosnia and Herzegovina. The Sarajevo Canton is located between 43 49 55 north latitude and between 18 0 east longitude. The distance between the northernmost and southernmost points of the Sarajevo Canton is 62 km, and between eastern and western points is 52.5 kilometers. Geographically, the Sarajevo Canton has an important position because it is crossed by the most important traffic communication lines north - south, east - west.

Figure 1. Position of the Sarajevo Canton in Bosnia and Herzegovina



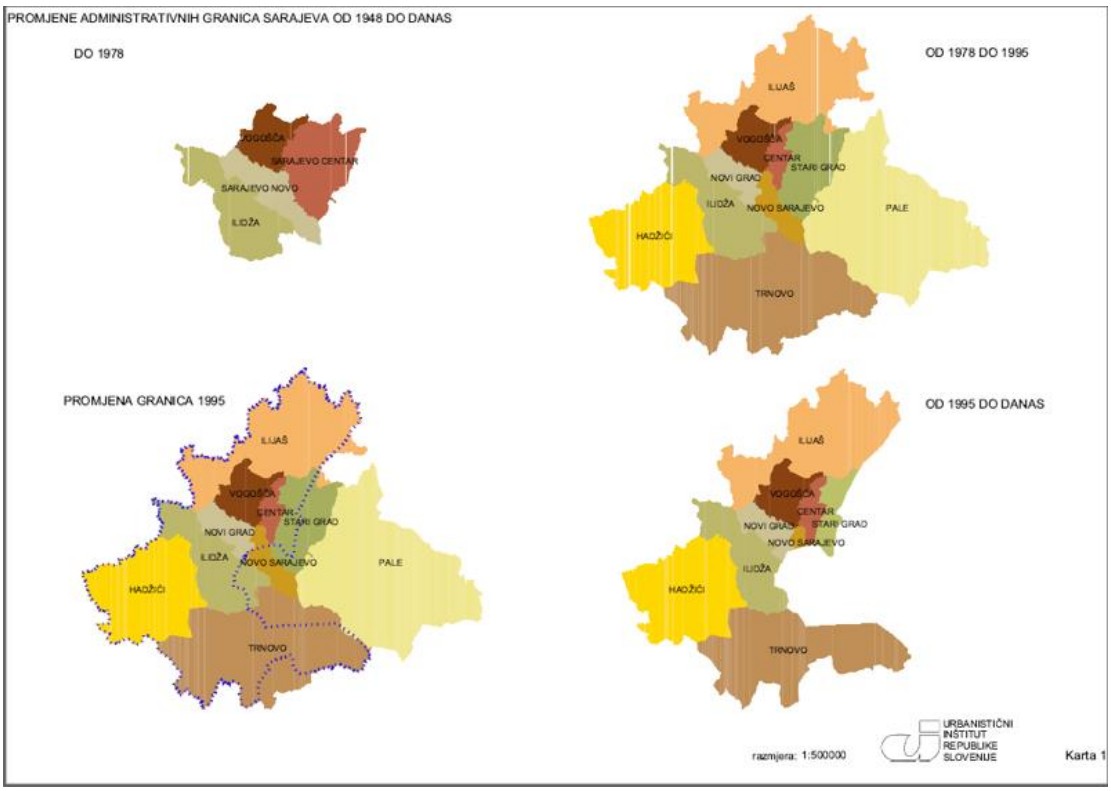
Source: *Spatial plan of the Sarajevo Canton for the period 2003 – 2023*, 2006, p. 223, Figure 1.

The change of the administrative boundaries of Sarajevo can be traced from 1978 to the present. The geopolitical position of the Sarajevo Canton and its territorial organization dates back to 1995, the Dayton Agreement. Until 1978, the city of Sarajevo consisted of the following municipalities: Sarajevo Center, Vogošća, Sarajevo Novo and Ilidža. Between 1978 and 1991 there was a change of administrative boundaries of the city of Sarajevo. Municipality of Sarajevo Center was divided into municipalities of Stari Grad and Centar, and the municipality of Novo Sarajevo to the municipalities of Novo Sarajevo and Novi Grad. Vogošća and Ilidža remained unchanged. Municipalities: Pale, Trnovo, Hadžići and Ilijaš are also part of the city of Sarajevo.

The boundaries of the city of Sarajevo changed significantly due to the war period from 1991 to 1995.

Parts of the municipalities Stari Grad, Novo Sarajevo, Ilidža, Trnovo and the entire Municipality of Pale, are part of the RS according to the new arrangement. Following the restructuring of the borders, the city of Sarajevo covers an area of 141.5 km^2. In accordance with the territorial organization of 1990, the municipalities Stari Grad, Center, Novi Grad and Novo Sarajevo remain as parts of the city of Sarajevo. The city of Sarajevo along with the municipalities Ilidža, Vogošća, Ilijaš, Hadžići and Trnovo comprise the Sarajevo Canton.

Figure 2. Change in the administrative boundaries of Sarajevo from 1978 to 2009



Source: *Spatial plan of the Sarajevo Canton for the period 2003 – 2023,* 2006, p. 224, Figure 2.

3.2 Population and population density of the Sarajevo Canton

The Sarajevo Canton covers an area of 1,268.5 km^2. The largest is the Trnovo Municipality area of 338.4 km^2, whileNovo Sarajevo has the smallest area of 9.9 km^2. The most densely populated municipality in the area of the Sarajevo Canton is the Novo Sarajevo Municipality, with an average population density of 7,225 inhabitants per km^2 in the period 1996-2013. Compared with the Municipality of Trnovo, which is the least populated municipality, density of population in the Municipality of Novo Sarajevo is 1,513 times higher. The average population density in the Municipality of Trnovo in the period 1996-2013 is 5 people per km^2. The average population density in the area of the Sarajevo Canton is 318 inhabitants per km^2 in the reporting period. The table 1. represents the area of municipalities in the Sarajevo Canton.

Table 1. Sarajevo Canton, city and municipalities – area in km^2

the city of Sarajevo				municipality within the Canton				
Stari Grad	Centar	Novo Sarajevo	Novi Grad	Ilidža	Vogošća	Hadžići	Ilijaš	Trnovo
51.4	33.0	9.9	47.2	143.4	72.0	273.0	309.0	338.0

Source: *Spatial plan of the Sarajevo Canton for the period 2003 – 2023*, 2006, p. 15, Table 1.

In the reporting period, there is a slight increase in population density in the Sarajevo Canton. Particular attention should be paid to the municipalities of Stari Grad, Center and Hadžići. These municipalities have a decreased population density. Further explanation of the reasons for the reduction in population density shall be provided later in this paper. Four city municipalities are 8 times smaller than the five municipalities that are not part of the city of Sarajevo. The city of Sarajevo has a higher density of population by km^2 than the Sarajevo Canton. The table 2. represents the change of population density by municipalities.

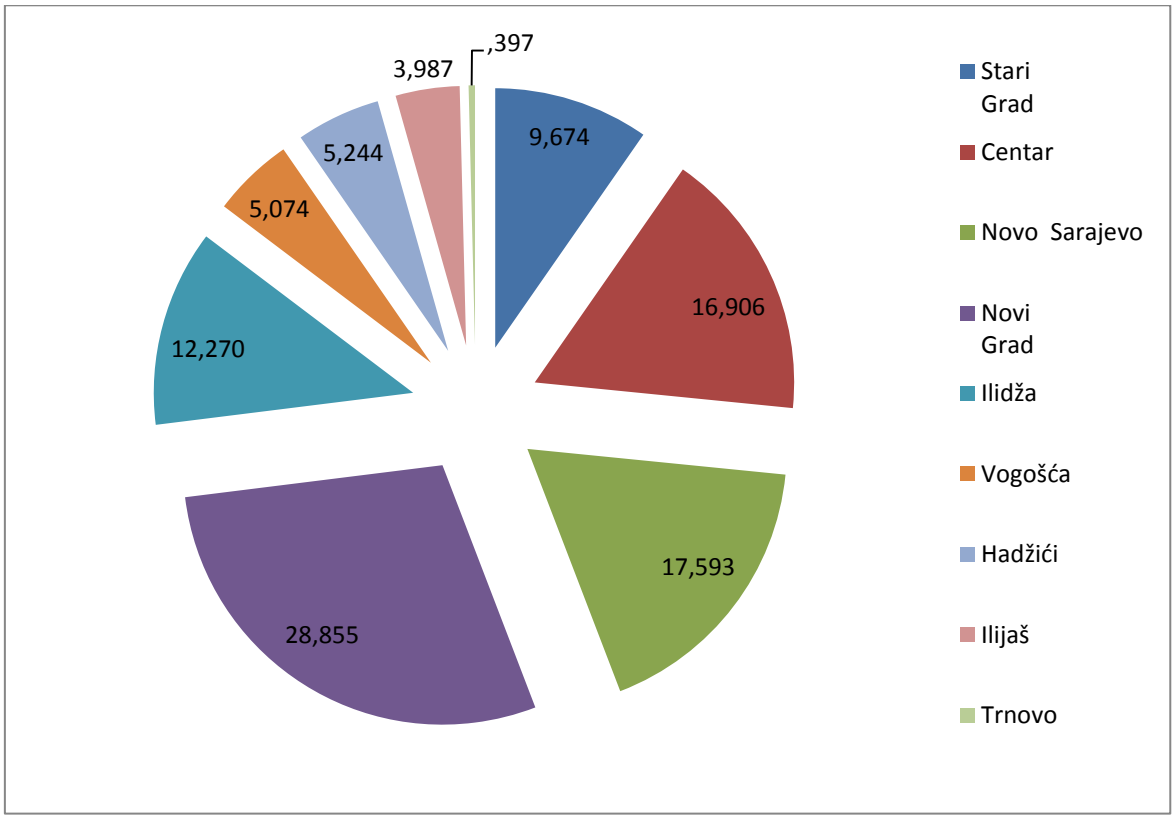
Table 2. Population density changes in the municipalities for the period 1996-2013.

Year	Stari Grad	Centar	Novo Sarajevo	Novi Grad	Sarajevo City	Ilidža	Vogošća	Hadžići	Ilijaš	Trnovo	Sarajevo Canton
area in km	51	33	9,9	47,2	142	143,4	72	273	309	338,4	1.419
1996	836	2.158	5773	2111	1915	262	215	87	41	2	254
1997	816	2.005	6247	2198	1935	280	241	71	42	2	257
1998	708	1.976	6875	2222	1940	293	251	70	45	2	260
1999	728	2.001	7014	2332	2000	310	261	71	47	2	268
2000	735	2.043	7266	2391	2049	321	269	72	48	2	275
2001	742	2.066	7522	2464	2100	331	276	73	49	3	282
2002	743	2.065	7525	2470	2102	332	277	74	50	2	283
2003	743	2.063	7515	2475	2103	334	277	74	50	2	283
2004	741	2.060	7512	2480	2103	335	279	74	50	2	283
2005	739	2.130	7412	2540	2131	337	286	80	50	6	289
2006	739	2.130	7406	2595	2149	337	286	81	55	6	292
2007	738	2.126	7401	2600	2149	365	287	81	57	6	295
2008	736	2.127	7412	2610	2153	369	293	82	57	8	297
2009	734	2.124	7411	2628	2157	374	300	83	58	7	299
2010	828	2.118	7414	2643	2195	413	320	83	60	7	308
2011	827	2.111	7433	2657	2199	419	326	83	61	7	309
2012	821	2.096	7449	2658	2195	421	353	83	62	7	311
2013	818	2.089	7457	2662	2194	426	359	83	63	8	312

The Sarajevo Canton records a constant population growth in the period 1996-2013. In mid-1996, 361,054 inhabitants resided in the area of the Sarajevo Canton. In mid-2013, 442,669 inhabitants resided in the area of Sarajevo Canton. Compared to 1996, there has been an increase in population of 81,615 inhabitants in the Sarajevo Canton.

The largest number of inhabitants live in the Municipality of Novi Grad (28.86%), while the smallest number of inhabitants live in the territory of the Municipality of Trnovo (0.40%). 73% of the total population of the Sarajevo Canton lives in the area of the city of Sarajevo.

Figure 3. The average annual share of the population in the municipalities in the area of Sarajevo Canton in the period 1996-2013



The population in the area of the Sarajevo Canton on average grew by 1% during this period, while the population in the City of Sarajevo had an average increase of 0.05%. City municipalities of Stari Grad and Centar record a population decline. The key reasons for the decrease in population are:

1. the change of the administrative boundaries of the municipality as compared to 1991,
2. ethnic structure of the population,
3. age structure of the population and
4. negative rate of natural population growth.

By signing of the Dayton Agreement in 1995, parts of municipalities of Stari Grad and Centar became a part of the Republika Srpska. Therefore, a portion of the population which had resided in the city of Sarajevo until 1991 changed their residence. According to the census of 1991, the territory of the Municipality of Stari Grad, and especially the Centar Municipality, was predominantly inhabited by Serbs. After the reintegration of Sarajevo, and the creation of the Canton of Sarajevo, the Serb population moved out to Lukavica and Pale.

In terms of the age structure in 1996, 16.73% of the area of the Municipality of Stari Grad and 18.58% of the area of the Centar Municipality was inhabited by the population aged 65 and over. Migration processes, reduced natality and increased mortality, which will be discussed later in this paper, led to a population decline in these municipalities.

Municipalities of Centar, Stari Grad, Novo Sarajevo and Hadžići recorded a negative population growth. These municipalities had a negative natural population growth in the period 2003-2008. This trend is particularly prominent in the municipalities of Centar and Stari Grad, where the mortality is significantly higher than the natality. Since the reintegration until today the Municipality of Hadžići has recorded a negative trend of natural growth.

From the urban viewpoint and regarding the possibility of building, municipalities of Centar and Stari Grad are very unfavorable. The lack of building land, the high price of living space (square meter of apartment) and low purchasing power of the population are some of the factors influencing the reduction in the number of inhabitants in these municipalities. Unlike the city municipalities, the Municipality of Trnovo is favorable for the building process from the urban viewpoint; however, poor communication infrastructure, distance from the town center and undeveloped commercial and economic infrastructure classify the Municipality of Trnovo as unfavorable for living.

If we analyze the rate of population growth in the Sarajevo Canton, we can come to the following conclusions: the largest population growth occurred in 1999 and 2008 when the population increased by **12,514** and **12,927** people, respectively.

For 50% of the observed time period, city municipalities of Stari Grad and Centar had a negative population growth, and the main reasons have already been explained. In **2007**, **2012** and **2013** the city of Sarajevo recorded a negative growth of the population, while this downward trend did not appear in the Sarajevo Canton.

The negative population growth was also recorded in the Municipality of Hadžići, and during this period of 16 years the municipality had a negative growth for **9** years. Figure 4. show the change of the total population of the Sarajevo Canton, table 3 shows population growth the period 1996-2013.

Figure 4. Changes in the total population in the Sarajevo Canton for the period 1996-2013.

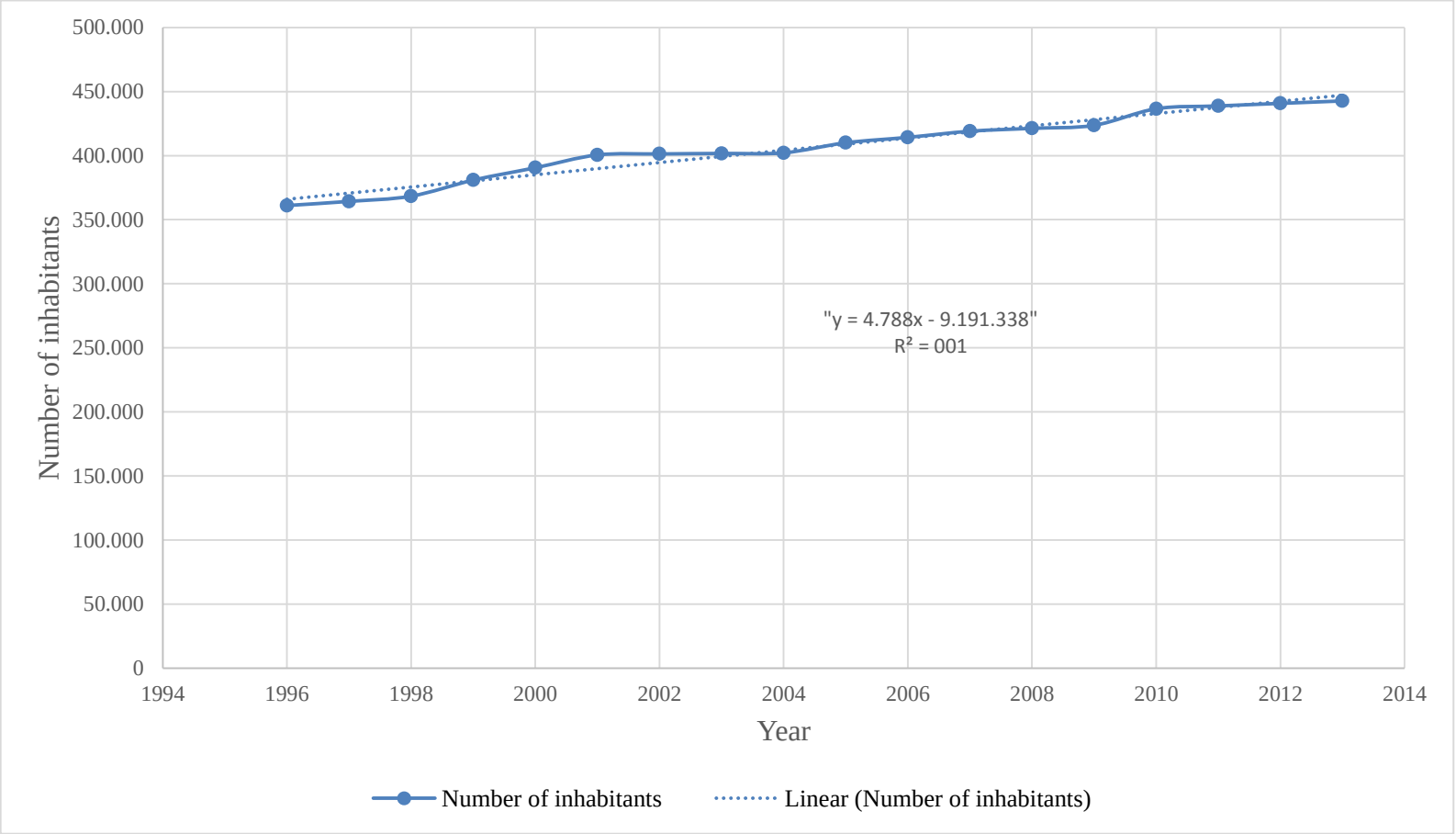


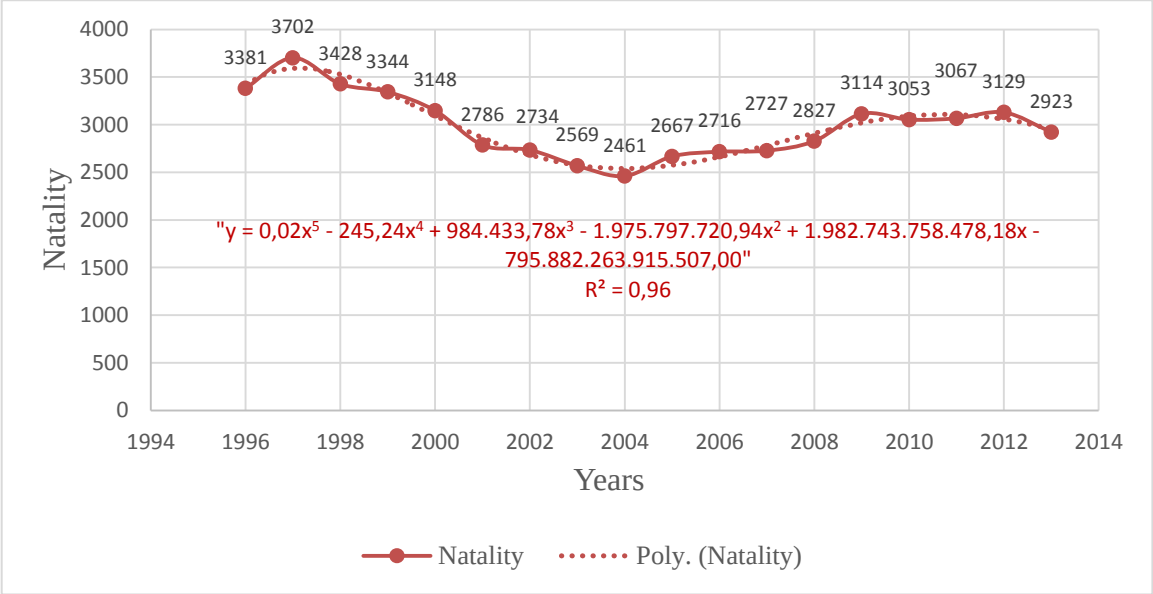
Table 3. Population growth in the Sarajevo Canton for the period 1996-2013.

Year	Stari Grad	Centar	Novo Sarajevo	Novi Grad	Sarajevo City	Ilidža	Vogošća	Hadžići	Ilijaš	Trnovo	Sarajevo Canton
1997	-1,000	-5,045	4,695	4,133	2,783	2,471	1,848	-4,153	354	-82	3,221
1998	-5,588	-963	6,208	1,113	770	1,925	711	-384	1,064	8	4,094
1999	1,022	828	1,378	5,208	8,436	2,466	754	318	529	11	12,514
2000	377	1,386	2,496	2,752	7,011	1,529	589	207	273	42	9,651
2001	376	743	2,539	3,450	7,108	1,482	464	356	505	49	9,964
2002	18	-22	22	300	318	152	114	169	76	-11	818
2003	44	-84	-91	244	113	270	0	0	0	-3	380
2004	-105	-93	-38	247	11	181	88	118	89	-17	470
2005	-106	2,320	-983	2,804	4,035	186	521	1,707	48	1,368	7,865
2006	-24	-5	-62	2,608	2,517	96	30	56	1,520	-4	4,215
2007	-59	-146	-51	246	-10	3,987	92	126	590	-1	4,784
2008	-85	60	111	463	549	522	411	239	166	372	2,259
2009	-95	-104	-8	835	628	704	487	257	310	-30	2,356
2010	4,843	-210	23	707	5,363	5,671	1,443	91	388	-29	12,927
2011	-71	-216	190	653	556	789	432	-22	492	-62	2,185
2012	-289	-517	164	52	-590	357	1,980	26	174	40	1,987
2013	-189	-223	72	179	-161	743	432	46	488	377	1.925

3.3 Vital characteristics of the population of the Sarajevo Canton

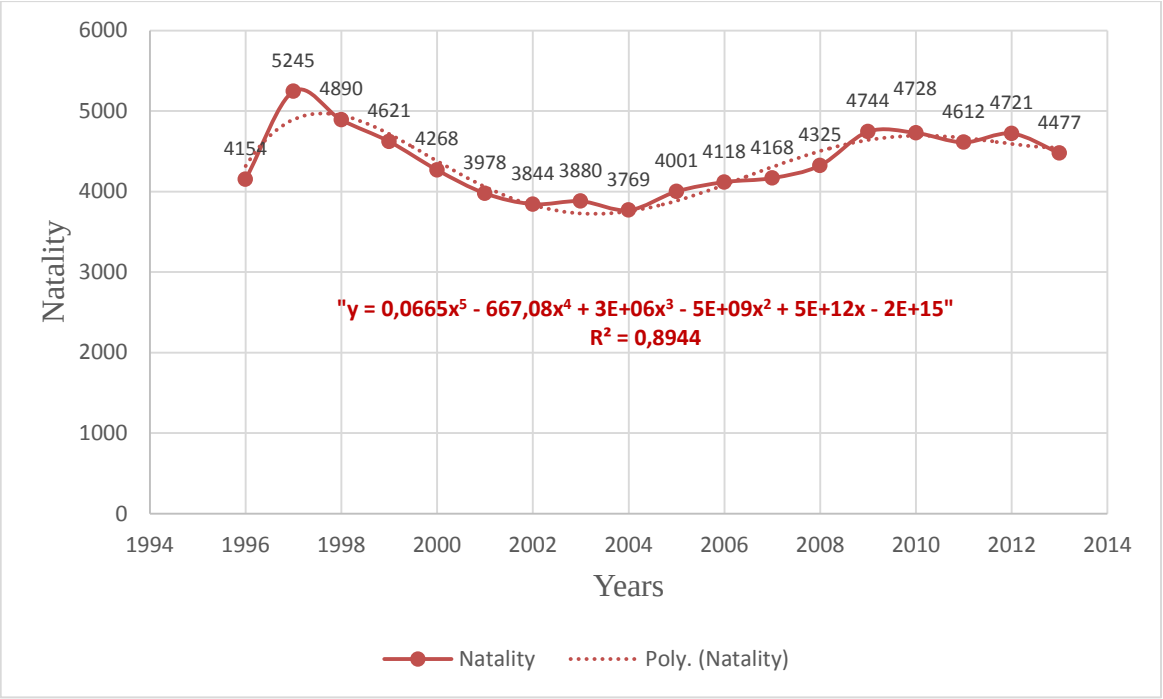
Changes in natality, mortality, natural population growth and vital index in the period 1996-2013 will be under consideration for the city of Sarajevo and the Sarajevo Canton. Within the same time period, four city municipalities recorded a decrease in natality and an increase in mortality.

Figure 5. Changes in the natality in the city of Sarajevo for the period 1996-2013



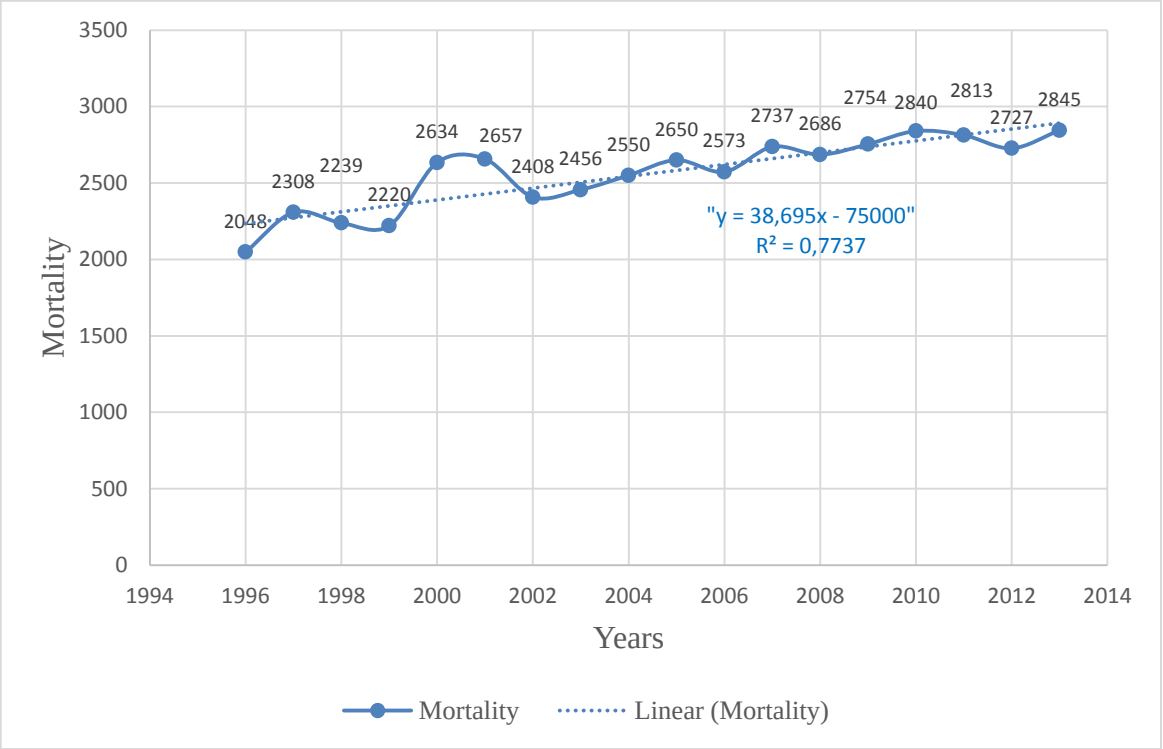
The highest natality in the city of Sarajevo was recorded in 1997 and amounted to **3,702** live-born babies, while the lowest natality in the city of Sarajevo was recorded in 2004 and amounted to **2,461** live born babies. Novi Grad Municipality has the highest natality in the city of Sarajevo and the Sarajevo Canton. The Municipality of Stari Grad has the lowest natality in the city of Sarajevo and it is **435** newborns a year on average for the referenced period of time. In the observed time period, the city of Sarajevo has a negative average natality growth (**- 26,94**) of newborns, which means that the average birth in each year has been declining for (**-26,94**) newborns. On the whole, it can be concluded that the natality in the city of Sarajevo has a cyclical (polynomial trend of decline) with **five** peaks.

Figure 6. Changes in the natality in the Sarajevo Canton for the period 1996-2013



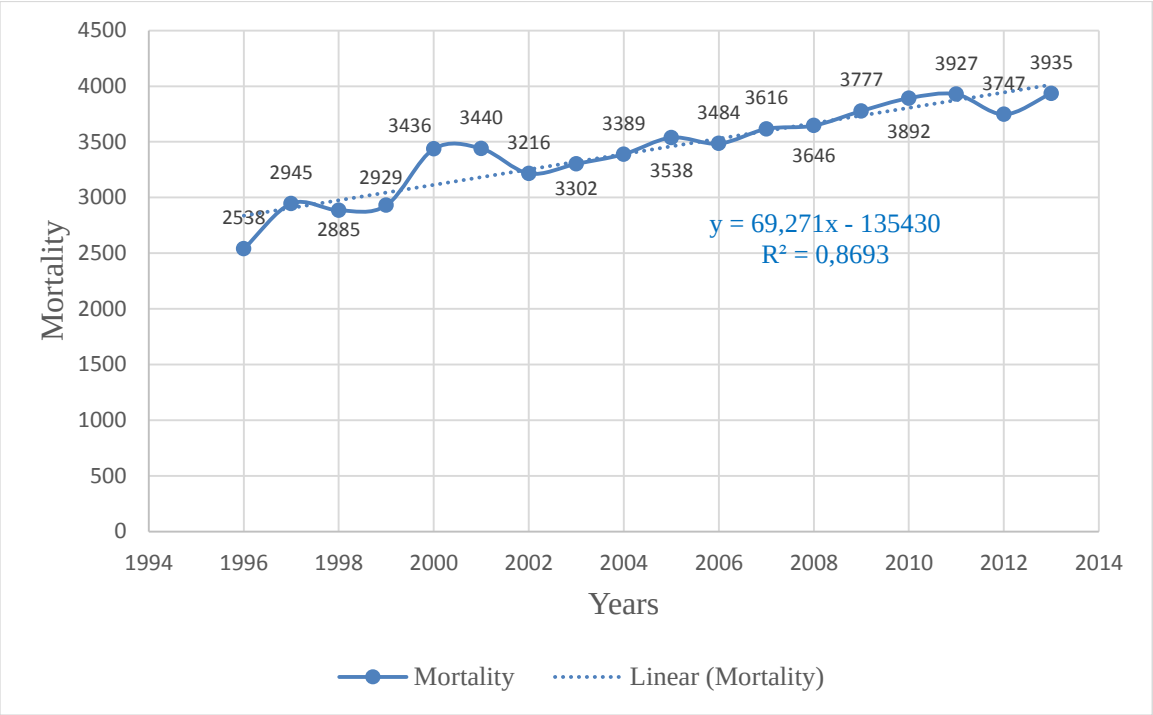
In the Sarajevo Canton the highest natality was recorded in 1997 and it was **5,245** live-born babies, while the lowest natality was recorded in 2004 with **3,769** live-born babies. The Municipality of Ilidža is the second largest municipality by natality in the Sarajevo Canton. In the Municipality of Hadžići natality on average decreased by **1.64** live-born children in the observed time period. In the Sarajevo Canton, natality had a positive average growth, and it amounted to (**19**) newborn babies. The highest average population growth in the observed period was registered in the Ilidža Municipality and it amounted to **25.64** newborns. On the whole, it can be concluded that the natality in the Sarajevo Canton has a cyclical (polynomial trend growth) with **five** peaks.

Figure 7. Changes in the mortality in the city of Sarajevo for the period 1996-2013



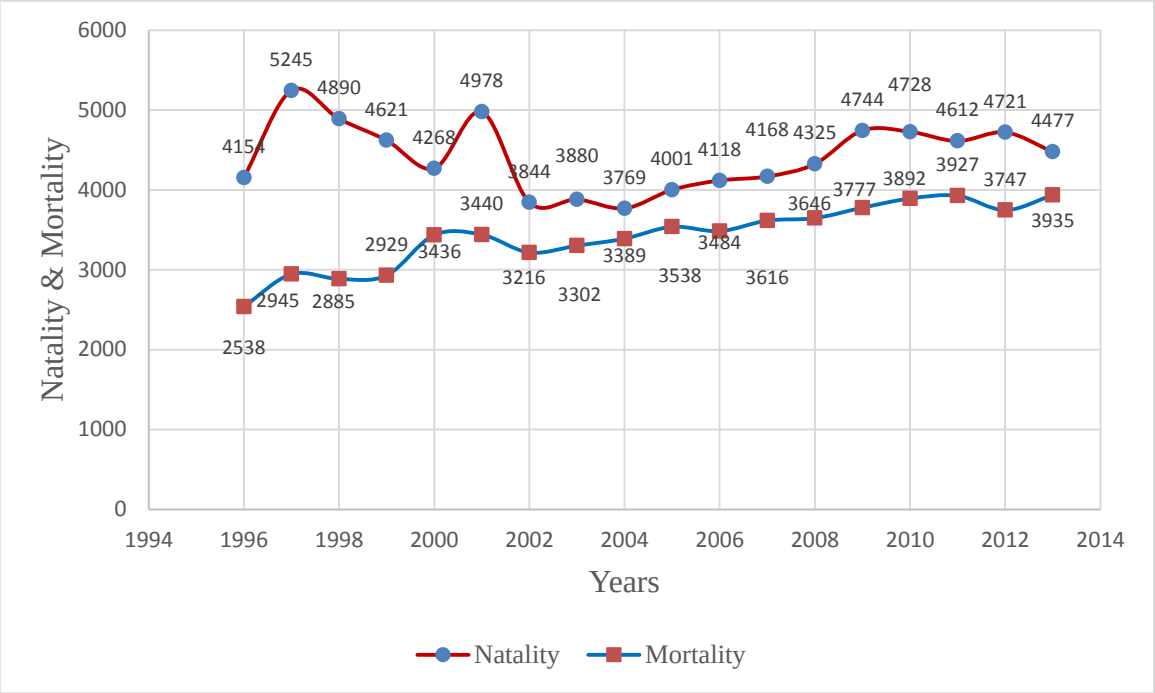
The highest mortality in the city of Sarajevo was recorded in 2013 and amounted to **2,845** deceased, while the lowest was in 1996 and amounted to **2,048** deceased. The highest mortality was registered in the Municipality of Novi Grad, which is quite reasonable if we take into account the fact that it is the municipality with the largest number of residents in the city and the Sarajevo Canton. In the city of Sarajevo, mortality grew on average by **46.9** deceased annually. From figure 7. it can be concluded that the mortality in the city of Sarajevo has a tendency of linear growth during this period.

Figure 8. Changes in the mortality in the Sarajevo Canton for the period 1996-2013



In the Sarajevo Canton, mortality was the lowest in 1996 and it amounted to **2,538** deceased, while it was the highest in 2013 and amounted to **3,935** deceased. The Municipality of Novi Grad can be singled out as the municipality with the highest natality and mortality. The highest average death during this period was recorded in the Municipality of Ilidža, where mortality grew each year by **15.7** deceased on average. In the Sarajevo Canton, mortality was increasing annually at an average of **82.2** deceased. The increase in mortality is accompanied by the increase in natality in the Sarajevo Canton.

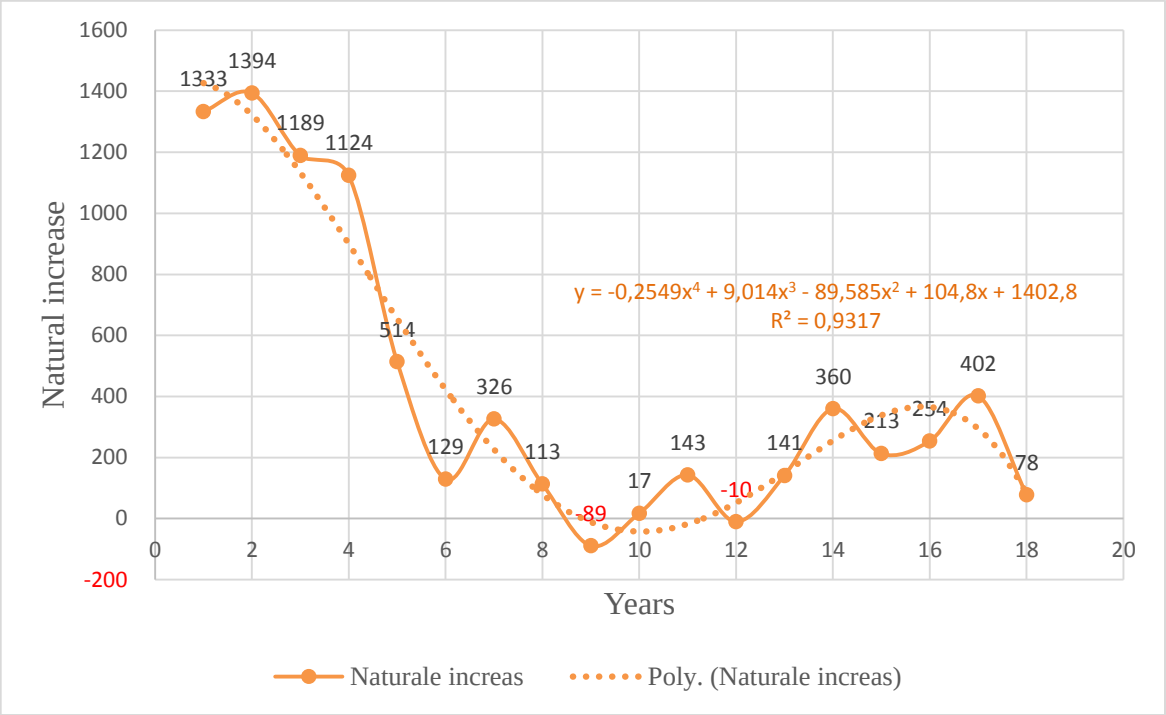
Figure 9. Changes in natality and mortality in the Sarajevo Canton for the period 1996-2013



In the period 1996-2013, the city of Sarajevo recorded a negative population growth twice: in **2004** and **2007**. Municipalities of Stari Grad, Novo Sarajevo and Centar consistently had a problem with depopulation in the period **2003-2008**. This situation is the result of changes in the age and ethnic structure, the cyclic movement of natality and a linear decline in mortality in these municipalities. The Municipality of Novi Grad consistently had a positive natural increase.

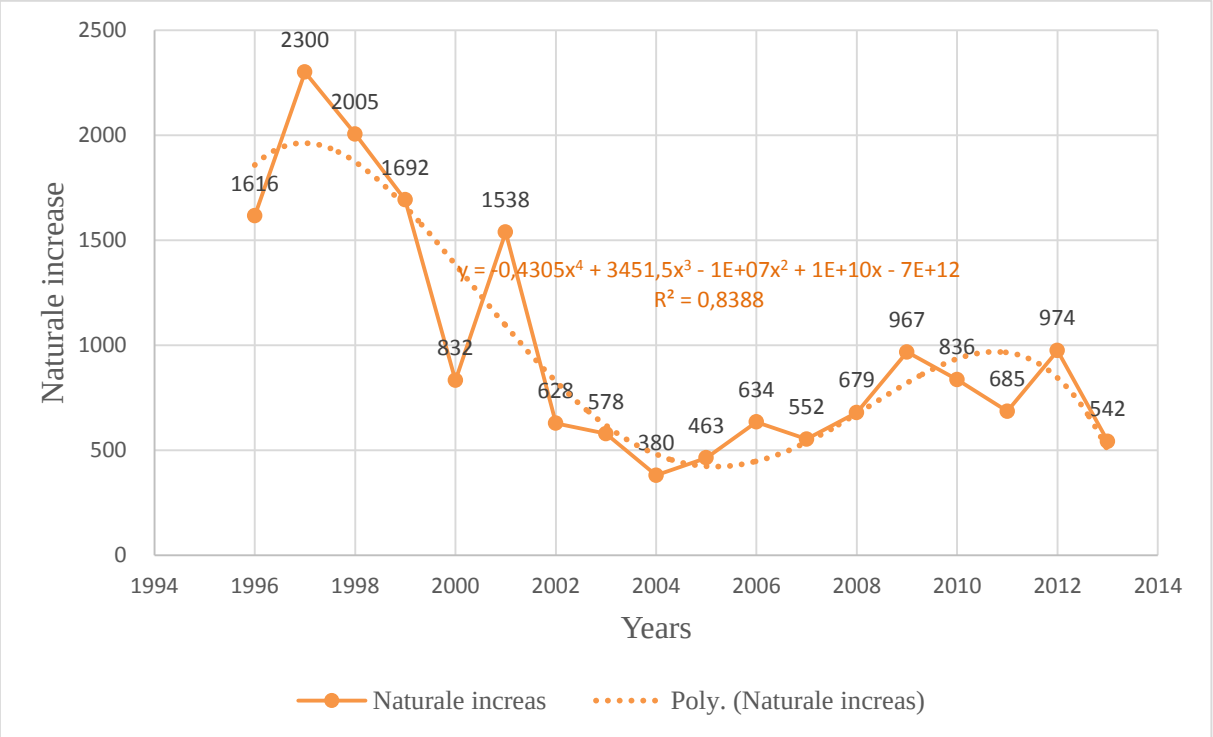
In comparison to 1996, natural population growth in the city of Sarajevo is **17** times lower. This situation arose as a result of the constant-linear growth in mortality, cyclical growth in natality that does not sufficiently follow the growth in mortality. If we look at the function of the natural growth through time, we come to the conclusion that it is cyclical i.e. has a cyclical trend.

Figure 10. Changes in population growth in the city of Sarajevo in the period 1996-2013



The Municipality of Trnovo is the only municipality in the Sarajevo Canton that sees a constant depopulation. Such a situation was created as a result of the changes in the age structure, poor infrastructure network and a high percentage of unemployment. When compared to 1996, in 2013, the population growth in the Sarajevo Canton was **2.98** times smaller. It is important to note that in the reporting period the Sarajevo Canton has not recorded negative population growth. The trend line of natural growth of Sarajevo Canton is cyclical.

Figure 11. Changes in population growth in the Sarajevo Canton in the period 1996-2013



Average vital index for the period 1996-2013 was **127**, which indicates that per 100 deceased persons we have **127** births in the Sarajevo Canton. Since the value of the vital index is 127, we can conclude that in the Sarajevo Canton have expanded reproduction of the population. But, if the trend of falling natality and rising mortality continues, the Sarajevo Canton is threatened by depopulation.

4 INFLUENCE OF CHANGES IN VITAL DEMOGRAPHIC PARAMETERS ON PUBLIC EDUCATION

4.1 Analysis of the current situation in primary education in the area of the Sarajevo Canton

At the beginning of 2012/2013 school year there were 85 schools for primary education, with 1,580 classes in the Sarajevo Canton. The total number of pupils who attended primary school in the Sarajevo Canton was 34,709. There were 2,462 teachers conducting the teaching process. The nine-year primary education replacing the old eight–year programme was introduced in the regular primary education in the school year 2004/2005.

Table 4. Primary education in the Sarajevo Canton in figures for the school year 2012/2013

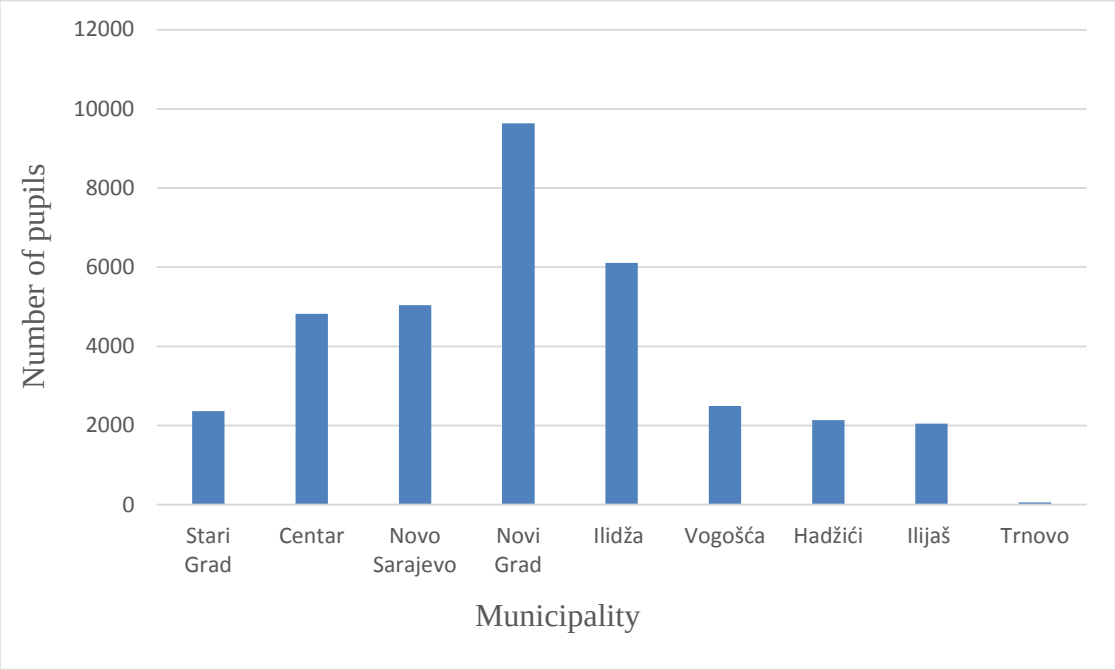
Municipality	Number of schools	Number of classes	Total number of pupils	Number of femail pupils	Number of teachers	Share of pupils by municipality	Average number of pupils per school	Average number pupils per class	Average number of pupils per teacher
Stari Grad	10	115	2,361	1,174	185	7	236	21	13
Centar	11	217	4,823	2,325	354	14	438	22	14
Novo Sarajevo	10	235	5,044	2,454	380	15	504	21	13
Novi Grad	16	413	9,632	4,665	605	28	602	23	16
The City of Sarajevo	47	980	21,860	10,618	1,524	63	465	22	14
Ilidža	12	276	6,110	2,985	437	18	509	22	14
Vogošća	6	111	2,490	1,212	172	7	415	22	14
Hadžići	7	102	2,140	1,034	140	6	306	21	15
Ilijaš	12	104	2,046	998	175	6	171	20	12
Trnovo	1	7	63	32	14	0,2	63	9	5
The Canton	85	1,580	34,709	16,879	2,462	100	408	22	14

Source: Public education of the Sarajevo Canton 2010, p. 22, Table 13.

The largest number of pupils attending primary education is in the Municipality of Novi Grad (28%). The average number of pupils in primary schools is 408. The largest number of pupils per school is in the Municipality of Novi Grad (602), followed by Ilidža (509) and Novo Sarajevo (504). In the Sarajevo Canton, the average number of classes per school is 19 and, when it comes to municipalities, it is up to 26 in Novi Grad, then 24 in Novo Sarajevo, 23 in Ilidža, while the the Municipality of Trnovo has the least.

The average number of pupils per class in the Sarajevo Canton is 22, and among municipalities, the highest is in Novi Grad 23, in Centar, Ilidža and Vogošća it is 22, in Stari Grad, Novo Sarajevo and Hadžići 21, while it is the smallest in Trnovo 9. The average number of pupils per teacher is 14. The highest number of pupils per teacher is recorded in Novi Grad which is 16, and the lowest in Trnovo: 5 students per teacher. Primary school pupils make up 7.9% of the total population of the Sarajevo Canton. The highest share of primary school pupils in the overall population is in the Municipality of Ilijaš 10.7%, and the lowest in the Municipality of Trnovo 2.5%

Figure 12. Total number of pupils in the Sarajevo Canton for the 2012/2013 school year



At the beginning of the school year 2012/2013 on the territory of the Federation of B&H, there were 1,118 schools of primary education with 9,868 classes comprising 199,569 students. Teaching was done by 11,579 teachers. The Sarajevo Canton in the Federation accounted for 7.8% of schools, 16.2% of classes and 17.4% of students. In the Federation of Bosnia and Herzegovina, on average, one school has 9 classes, with 183 pupils, and there are on average 20 pupils per class. On average, one school has 14 teachers, and the average number of pupils per teacher is 13.

4.2 Analysis of the changes in the number of students and teachers in elementary schools in the Sarajevo Canton for the period 2000-2010

For the purpose of this analysis we will monitor the changes in primary education in the Sarajevo Canton every five years, i.e. for the school years 2000/2001, 2005/2006 and 2010/2011.

In the school year 2000/2001, in the Sarajevo Canton classes were taught in 74 primary schools. Primary education was attended by 38,133 pupils, and the teaching was carried out by 2,133 teachers. The largest number of pupils was recorded in the Municipality of Novi Grad. On average, a primary school was attended by 470 pupils, there were 24 pupils per class, while the average number of pupils per teacher was 17.

Table 5. Primary education in the Sarajevo Canton in figures for the school year 2000/2001

Municipality	Number of schools	Number of classes	Total number of pupils	Number of femail pupils	Number of teachers	Share of pupils by municipality	Average number of pupils per school	Average number of pupils per class	Average number of pupils per teacher
Stari Grad	8	125	3,088	1,482	181	8	386	25	17
Centar	11	250	6,056	2,924	360	16	551	24	17
Novo Sarajevo	9	226	5,868	2,847	337	15	652	26	17
Novi Grad	13	415	10,625	5,155	558	28	817	26	19
The City of Sarajevo	41	1,016	25,637	12,408	1,436	67	625	25	18
Ilidža	12	214	5,541	2,650	312	15	462	26	18
Vogošća	5	99	2,649	1,306	144	7	530	27	18
Hadžići	7	87	2,420	1,099	117	6	346	28	21
Ilijaš	7	73	1,830	862	90	5	261	25	20
Trnovo	2	6	56	20	14	0,15	28	9	4
The Canton	74	1,495	38,133	18,345	2,113	100	515	26	18

Source: Public education of the Sarajevo Canton 2010, p. 23, Table 14.

In the school year 2005/2006, a slight increase in the number of pupils was recorded in the Sarajevo Canton. In comparison to the school year 2000/2001, the number of pupils had increased by 2,165, so that primary education was attended by 40,298 pupils. The slight increase in the number of pupils can be attributed to the education reform i.e. the introduction of nine-year primary education. The age limit for starting school shifted from seven years to six years of age, although in 2004/2005 two generations started school. An increase in population in the Sarajevo Canton in 1998 and 1999 contributed to this trend.

Classes were held in 83 primary schools. The increase in the number of primary schools can be attributed to the opening of private educational institutions. The average number of pupils in primary schools was 449, there were 23 pupils per class and the average number of pu per teacher was 17.

The decline in the number of pupils per school and per class can be explained by the opening ofthe additional 9 institutions of primary education and declining natality in some municipalities in regards to 1997. When compared to the school year 2000/2001, the number of pupils per teacher remained unchanged thanks to proportional increase in the number of pupils which was matched by an increase in teaching staff.

It is worth mentioning that the municipalities of Center and Novi Grad registered a decline in the number of pupils in the school year 2005/2006, which was accompanied by an increase in the number of teaching staff. Only the Municipality of Novi Grad recorded a decline in teaching staff in comparison to the school year 2000/2001, which resulted in the increase in the number of pupils per teacher.

Table 6. Primary education in the Sarajevo Canton in figures for the school year 2005/2006

Municipality	Number of schools	Number of classes	Total number of pupils	Number of femail pupils	Number of teachers	Share of pupils by municipality	Average number of pupils per school	Average number of pupils per class	Average number of pupils per teacher
Stari Grad	8	137	3,133	1,519	195	8	392	23	16
Centar	11	247	5,880	2,822	378	15	535	24	16
Novo Sarajevo	10	229	5,417	2,618	364	13	542	24	15
Novi Grad	15	419	11,205	5,550	421	28	747	27	27
The City of Sarajevo	44	1,032	25,635	12,509	1,358	64	583	25	19
Ilidža	12	278	6,943	3,340	408	17	579	25	17
Vogošća	6	114	2,755	1,355	178	7	459	24	15
Hadžići	7	103	2,578	1,190	145	6	368	25	18
Ilijaš	12	102	2,268	1,051	143	6	189	22	16
Trnovo	2	8	119	57	18	0	60	15	7
The Canton	83	1,637	40,298	19,502	2,250	100	486	25	18

Source: Public education of the Sarajevo Canton 2010, p. 24, Table 15.

The school year 2010/2011 saw a decline in the number of pupils in the Sarajevo Canton. The classes took place in the 85 educational institutions, which were attended by 37,552 pupils. The average number of pupils per teacher was 19. On average, a school had 411 pupils. It is impossible to specify the number of pupils per class, as secondary data is not available. All city municipalities recorded a decline in the number of pupils in primary schools that can be attributed to the declining natality in 2002-2004. It is interesting to note that 2004. is remembered as the year with the lowest natality in the period 1996-2013. The political crisis in the Federation of Bosnia and Herzegovina that reached its peak in 2003 contributed to this situation.

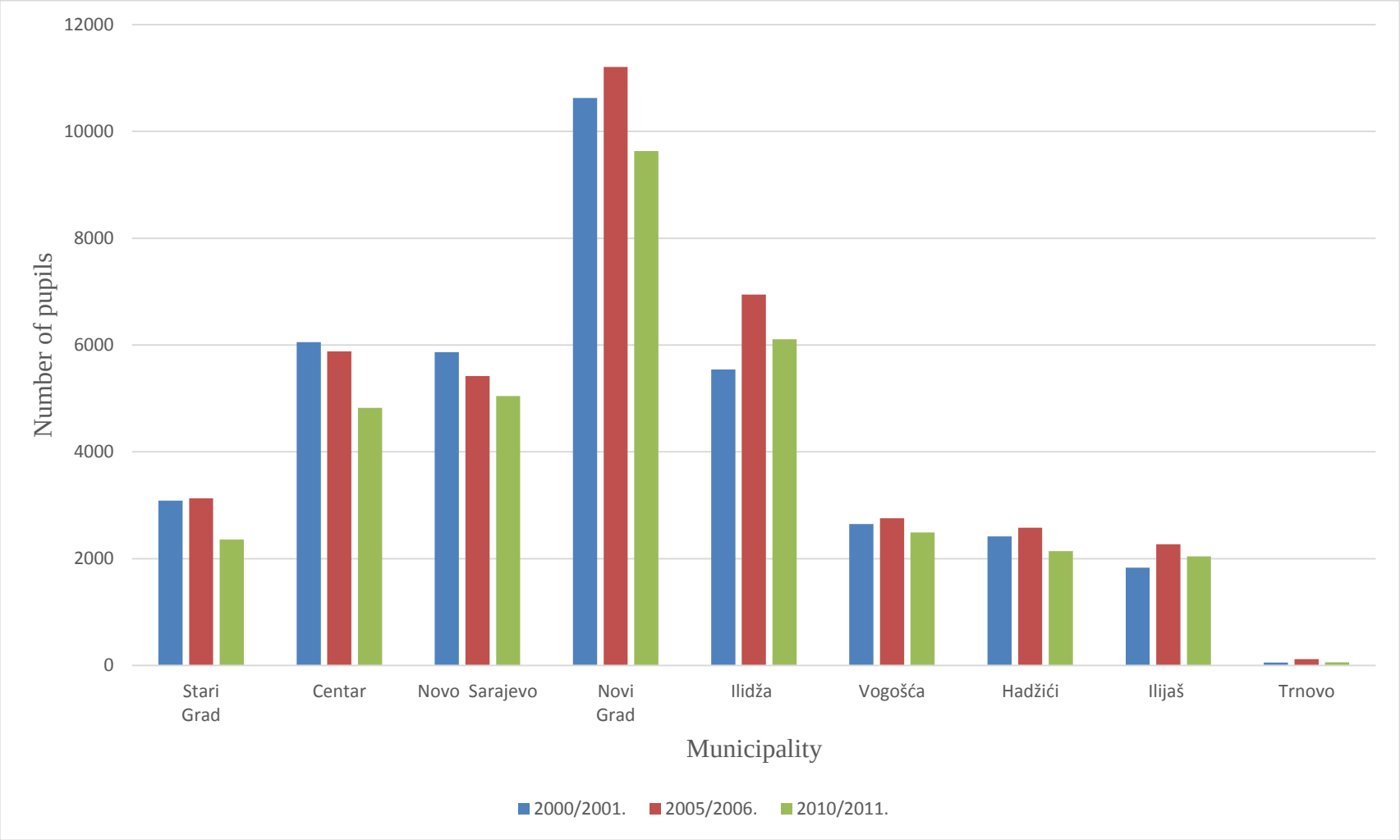
It can be concluded that the number of pupils in the period 2000/2011 decreased, the number of pupils per class remained the same (17), the average number of pupils per teacher decreased as a result of an increased number of teaching staff in the school year 2005/2006. The largest decline in the number of pupils in the Canton Sarajevo was recorded in the school year 2012/2013. This situation arose as a result of falling natality and rising mortality which ultimately resulted in a low natural population growth. This trend was very prominent in 2003-2006. The beginning of the economic and financial crisis significantly contributed to this situation, which resulted in a reduction in living standards, increase in the consumer prices, increase in unemployment and falling wages. When compared to the school year 2005/2006, the number of pupils decreased by 2.843. Number of primary schools increased from 84 to 85. Reduction in the number of pupils was accompanied by a reduction in the teaching staff.

Table 7. Primary education in the Sarajevo Canton in figures for the school year 2010/2011

Municipality	**Number of schools**	**Number of classes**	**Total number of pupils**	**Number of femail pupils**	**Number of teacher**	**Share of pupils by municipality**	**Average number of pupils per school**	**Average number of pupils per class**	**Average number of pupils per teacher**
Stari Grad	10	115	2,361	1,174	185	7	236	21	13
Centar	11	217	4,823	2,325	354	14	438	22	14
Novo Sarajevo	10	235	5,044	2,454	380	15	504	21	13
Novi Grad	16	413	9,632	4,665	605	28	602	23	16
The City of Sarajevo	47	980	21,860	10,618	1,524	63	465	22	14
Ilidža	12	276	6,110	2,985	437	18	509	22	14
Vogošća	6	111	2,490	1,212	172	7	415	22	14
Hadžići	7	102	2,140	1,034	140	6	306	21	15
Ilijaš	12	104	2,046	998	175	6	171	20	12
Trnovo	1	7	63	32	14	0,2	63	9	5
The Canton	85	1,580	34,709	16,879	2,462	100	408	22	14

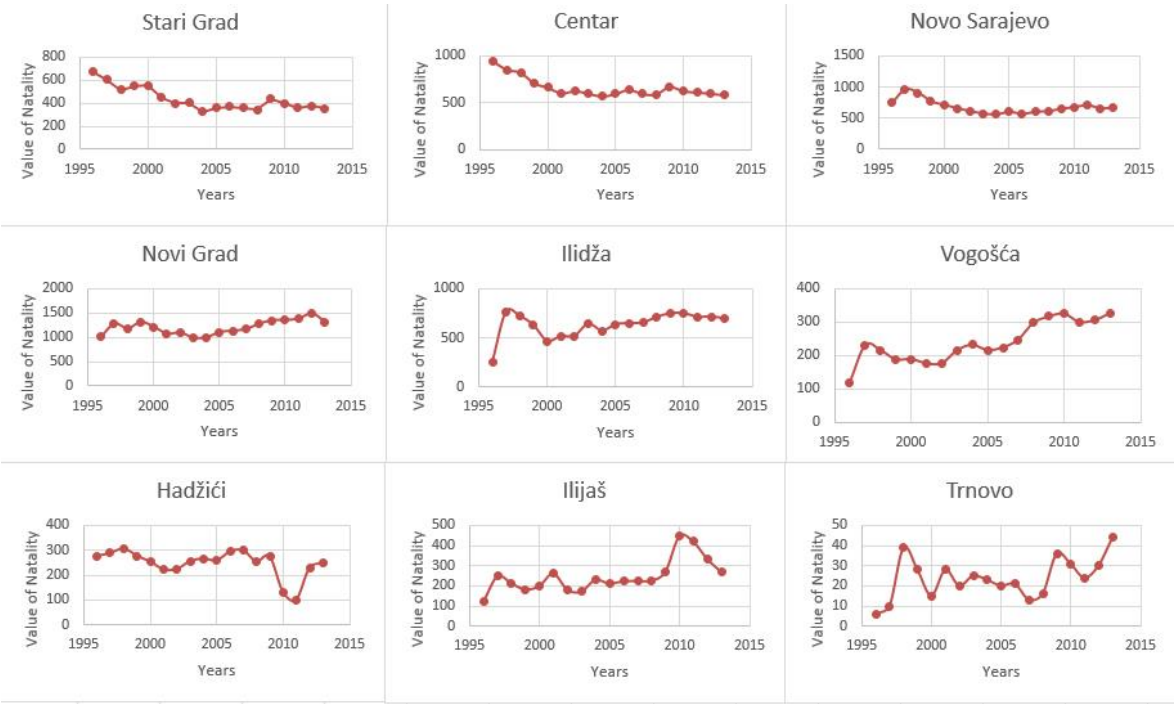
Source: Public education of the Sarajevo Canton 2010, p. 25, Table 17.

Figure 13. Number of pupils per municipality for the three points in the time



A conclusion can be drawn from the graphic 13. that all municipalities in theSarajevo Canton record a decline in the number of primary-education students in the period 2000 / 2001- 2010/2011. The largest drop in the number of students of primary education was recorded in the municipality of Centar (1123 students), then in the municipality of Novi Grad (993 students) and Novo Sarajevo (824 students). If we were to compare the academic year 2000/2001 to 2010/2011, municipalities Ilidza and Trnovo record an increase in the number of primary-education students. The smallest number of students of primary education is in the area of Trnovo and the largest is in the municipality of Novi Grad.

Figure 14. Value of natality per municipality for the period 1996-2013.



The fall in the number of students of primary education in the area of the municipalities of Stari Grad, Centar, Novo Sarajevo and Hadzici in the same time period may be brought in relation with falling natality in these municipalities. In the same period in the municipalities of Ilidza and Ilijas we see an increase in the number of primary school students which is in line with the increase in natality in these municipalities. In the municipality of Vogosca, the increase in natality is not accompanied by a growth in the number of students of primary education..

4.2.1 Analysis of the effective area per student compared to pedagogical standatds and norms for primary education in the Federation of B&H

The goal of this analysis is to provide an overview of the current situation in primary education in the Canton Sarajevo. For the purpose of making as precise analysis as possible we will use data for the school year 2010/2011. Private and special schools of primary education will not be taken under consideration.

Based on the pedagogical standards and norms for primary education in the Federation of B&H, a primary school can have a minimum of 18 classes, optimally 25 classes and a maximum of 36 classes, if classes are held in two shifts. The optimum number of students per class is 24, the minimum number of students is 16, and the maximum number of students per class is 30. The optimum classroom surface area per student is 3 m^2. It should be noted that the calculation of the optimum surface area per student does not include the surface of the gym.

Table 8. Primary schools in the municipality "Stari Grad" that do not meet the pedagogical standards and norms for primary education in the Federation of B&H

No.	Primary school	Number of pupils	Number of classes	Pupils per class	Schift	Area of school	Area per pupil
1	"Saburina"	453	21	22	3	1.397	3

In the Municipality of Stari Grad, teaching in primary schools is carried out in two shifts, in the 125 classes. Elementary school "Saburina" operates in three shifts, because of the limited surface of 3 m^2 that is on the fringes of pedagogical norms. Average usable space per pupil is 5 m^2 in the Municipality of Stari Grad. Teaching in one shift is carried out in 5 hours and 25 minutes.

Table 9. Primary schools in the municipality "Centar" that do not meet the pedagogical standards and norms for primary education in the Federation of B&H

No.	Primary school	Number of pupils	Number of classes	Pupils per class	Schift	Area of school	Area per pupil
1	"Katolički školski centar"	881	37	24	2	4,127	5
2	"Nafija Sarajlić"	611	26	24	2	2,000	3
3	"Safet beg Bašagić"	567	23	25	2	1,704	3
4	"Isak Samokovlija"	717	29	25	2	2,225	3

In the Centar Municipality, the Catholic School Centre operates in 37 classes working in two shifts, which is not in accordance with the norms. The average size of usable space per pupil is 6 m^2 at the Centar Municipality level.

Primary schools "Nafija Sarajlić", "Safvet beg Bašagić" and "Isak Samokovlija" represent border cases when it comes to usable space per student, i.e. it is 3 m^2. As in the Municipality of Stari Grad, the classes in one shift are conducted for 5 hours and 25 minutes due to work in two shifts; however, schools are not able to organize extended stay for the students.

Table 10. Primary schools in the municipality "Novo Sarajevo" that do not meet the pedagogical standards and norms for primary education in the Federation of B&H

No.	Primary school	Number of pupils	Number of classes	Pupils per class	Schift	Area of school	Area per pupil
1	"Pofalići"	657	30	22	2	1,950	3
2	"Malta"	564	26	22	2	2,418	4

Novo Sarajevo Municipality has 8 primary schools. It is interesting to note that the school "Čengić Vila 1" conducts the classes in four shifts, which is not in accordance with the norms. Elementary school "Pofalići" is on the minimum when it comes to the surface of usable space per student, i.e. it is 3 m^2. The average size of usable space per student at the level of Novo Sarajevo Municipality is 5 m^2.

Table 11. Primary schools in the municipality "Novi Grad" that do not meet the pedagogical standards and norms for primary education in the Federation of B&H

No.	Primary school	Number of pupils	Number of classes	Pupils per class	Schift	Area of school	Area per pupil
1	"Avdo Smailović"	1088	45	24	2	3,961	4
2	„Umihana Čuvidina“	1003	44	23	4	3,260	3
3	„Skender Kulenović“	856	37	23	2	3,901	5
4	„Aleksa Šantić“	899	38	24	2	4,500	5
5	„Behaudin Selmanović“	620	27	23	3	1,117	2
6	„Dobroševići“	565	23	25	2	991	2

The Municipality of Novi Grad is the most populous municipality in the Sarajevo Canton. Classes are held in 14 schools of primary education. Five schools do not meet the norm when it comes to the maximum allowed number of classes per school and these are: "Avdo Smajlović", "Umihana Čuvidina", "Skender Kulenović" and "Aleksa Šantić". Elementary schools "Behaudin Selmanović" and "Dobroševići" do not satisfy the criteria for optimum usable space per student, i.e. it is 2 m^2.

In the schools “Umihana Čuvidina” and "Behaudin Selmanović" classes are held in 4 and 3 shifts respectively. It can be concluded from all this data that the most populous municipalities of the Sarajevo Canton have the most difficulties in meeting the pedagogical standards and norms for the primary education of the Federation of Bosnia and Herzegovina.

Table 12. Primary schools in the municipality “Ilijaš” that do not meet the pedagogical standards and norms for primary education in the Federation of B&H

No.	Primary school	Number of pupils	Number of classes	Pupils per class	Schift	Area of school	Area per pupil
1	“Hašim Spahić"	1110	48	23	2	3,240	3

The Municipality of Ilijaš carries out primary education in 11 schools, of which 8 are listed as branch schools. In four schools classes are held in two shifts. Elementary school "Hasim Spahić" operates in 48 classes which is not in accordance with the norms.

Table 13. Primary schools in the municipality “Hadžići” that do not meet the pedagogical standards and norms for primary education in the Federation of B&H

No.	Primary school	Number of pupils	Number of classes	Pupils per class	Schift	Area of school	Area per pupil
1	"6. mart"	1245	53	23.5	3	4,566	4

In the Municipality of Hadžići, teaching is carried out in 7 primary schools. The primary school "6. mart" operates in 53 classes in 3 shifts; nevertheless, in spite of these indicators, the school meets the criteria for optimum usable space per pupil which is 4 m^2

Table 14. Primary schools in the municipality “Ilidža” that do not meet the pedagogical standards and norms for primary education in the Federation of B&H

No.	Primary school	Number of pupils	Number of classes	Pupils per class	Schift	Area of school	Area per pupil
1	"Druga osnovna škola"	751	32	23.5	3	3,291	4
2	"Treća osnovna škola"	1.138	47	24.2	3	3,396	3
3	"Osjek"	304	13	23.4	3	0	0
4	"Peta osnovna škola"	777	34	22.9	3	2,816	4
5	"Sedma osnovna škola"	686	29	23.7	3	1,335	2

The Ilidža Municipality is the second most populated municipality of the Sarajevo Canton. Primary education is carried out in 11 schools. "Treća osnovna škola" has more classes than the optimum. In 5 of 11 schools the classes are held in three shifts ("Treća", "Četvrta", "Osjek", "Peta" and "Sedma osnovna škola"). "Treća osnovna škola" operates in 47 classes in 3 shifts. None of the primary schools in the Municipality of Ilidža has the possibility for the organization and realization of the extended stay. "Sedma osnovna škola" does not satisfy the criteria for optimum surface per pupil, i.e. it is only 2 m^2.

Table 15. Primary schools in the municipality "Vogošča" that do not meet the pedagogical standards and norms for primary education in the Federation of B&H

No.	Primary school	Number of pupils	Number of classes	Pupils per class	Schift	Area of school	Area per pupil
1	"Zahid Baručija"	496	21	24	2	1,064	2

In the municipalities of Vogošća and Trnovo there are no significant irregularities regarding the pedagogical standards and norms for primary education in the Federation of B&H. Primary school "Zahid Baručija" does not satisfy the standard of optimum usable space, i.e. it is 2 m^2.

The following conclusions can be drawn from the Table 8. to Table 15.:

1. 21 of the 77 primary schools of the Sarajevo Canton do not meet the basic pedagogical norms of FB&H,
2. 8 of the 77 primary schools of the Sarajevo Canton operate in three or more shifts,
3. 12 of the 77 primary schools of the Sarajevo Canton have a problem with a minimum surface area of optimum space per student (3 m^2),
4. 8 of the 77 primary schools of the Sarajevo Canton have a larger number of classes than permitted by norms, if one takes into account that schools work in two shifts.

From these data we can conclude that primary schools in the Sarajevo Canton have the most problems when it comes to the norm which refers to the usable space per student. It should be noted that nearly 1/3 of primary schools do not satisfy the basic pedagogical norms for the Federation of Bosnia and Herzegovina, which are far behind the standards applicable in OECD countries; furthermore, this means that they will not meet the minimum standards of OECD countries as stated by the third argument of my master's thesis.

The following norms apply for OECD countries: the number of students per class of primary school is 22 on average, the optimum size of usable space per student is 6 m^2. Classes are held in one shift with the possibility of organizing extended stay for students.

In the case of the Municipality of Stari Grad, we can say that all schools have an optimum number of students per class when compared to OECD countries, while 66.67% of the schools do not meet the requirements for the optimum area of usable space per student. This situation comes from the fact that the largest number of schools was built in the second half of the 20th century.

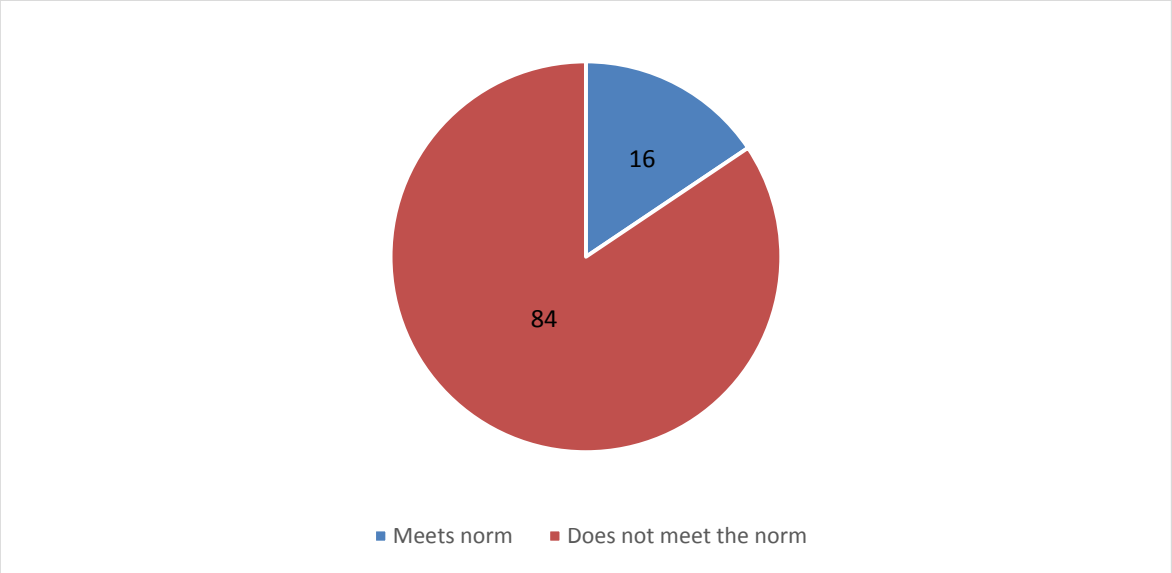
Schools in the Centar Municipality have 22 students in the class on average, which is in line with the optimum. Optimum usable space per student is satisfactory in two out of the eight primary schools.

In the Municipality of Novi Grad, the average number of students per class is 24, while usable space per student is 4.6 m^2. Accordingly, we can conclude that the OECD standards are not met.

Table 16. List of primary schools in the Sarajevo Canton that meet the standards of primary education of OECD

No.	Primary school	Number of pupils	Number of classes	Pupils per class	Shift	Area of school	Area per pupil
1	"Hamdija Kreševljaković"	386	18	21	2	2,774	7
2	"Mula Mustafa Bašeskija"	452	21	22	2	2,553	6
3	"Edhem Mulabdić"	704	33	21	2	4,982	7
4	"Hasan Kaimija"	267	14	19	2	1,978	7
5	"Hasan Kikić"	262	13	20	2	2,439	9
6	"Vladimir Skarić"	241	11	22	1	2,964	12
7	"Kovačići"	519	25	21	2	2,900	6
8	"Grbavica1"	432	21	21	2	2,677	6
9	"Džemaludin Čaušević"	566	26	22	2	3,480	6
10	PŠ "Gajevi"	14	2	7	1	120	9
11	PŠ "Dragoradi"	6	1	6	1	240	40
12	"Četvrta osnovna škola"	376	19	20	2	2,275	6

Figure 15. Share of schools in the Sarajevo Canton that meet – do not meet the standards of primary education of OECD countries



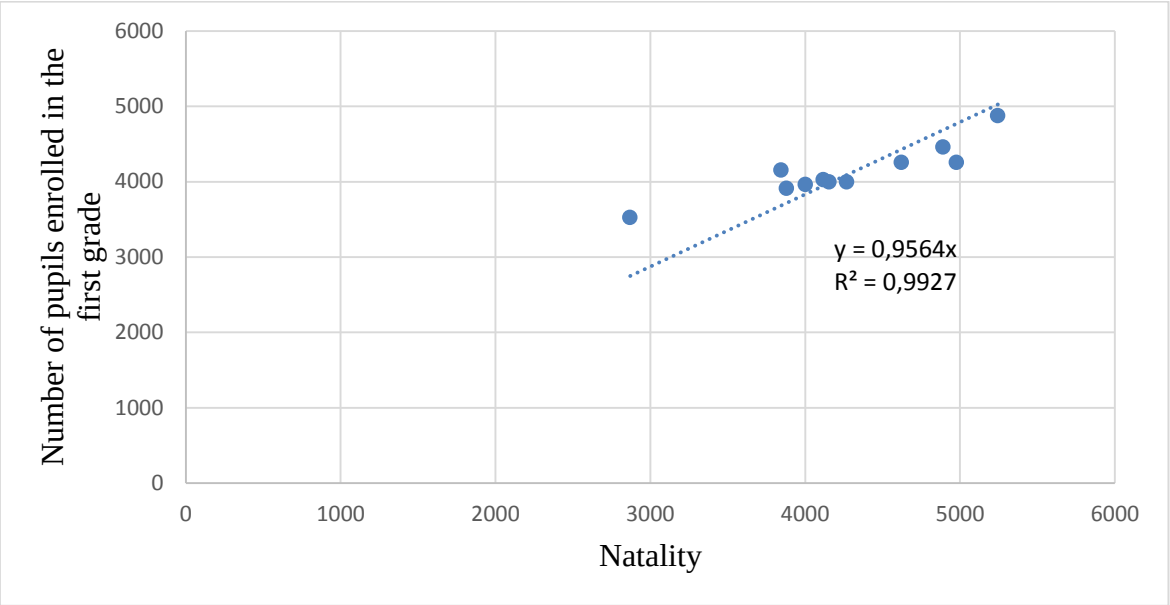
It can be concluded that the primary education of the Sarajevo Canton is far behind the norms of the OECD countries. Two parameters were analyzed for the purpose of the thesis: the number of students per class and usable space per student. Only 16% of primary schools of the Sarajevo Canton, i.e. 12 institutions, meet these two parameters. In this way it has been shown that primary education of the Sarajevo Canton does not satisfy the minimum standards of the OECD countries; hence, the third argument of the master thesis has been confirmed.

In order to satisfy the criteria set for the OECD countries in terms of the optimum usable space in the Sarajevo Canton, it is necessary to build additional 54,226 m^2. The average size of primary schools is 2,784 m2, which means that it is necessary to build additional 19.48 schools.

4.3 Regression analysis of the number of students enrolled in the first grade compared to the natality

For the purpose of this analysis, we took into consideration the natality and the number of pupils enrolled in the first grade. The natality was observed in the period from 1996 to 2006 and it was compared with the number of pupils in the period from 2003 to 2012. People born in 1996 were enrolled in the first year of eight-year education in 2003. In the school year 2004/2005, the nine-year education was introduced in the Sarajevo Canton; hence, an increase in the number of enrolled students was evident Natality is taken as an independent variable (x), while the number of pupils enrolled in the first grade represents a dependent variable (y). The regression model was developed with a “constant term” equal to zero, because this assumption is theoretically possible.

Figure 16. Relationship between natality and the number of pupils enrolled in primary schools for the period 1996-2006



Based on the figure 15 it can be concluded that the birth rate in the period 1996-2006 and the number of students enrolled in the first grade of primary education in the period 2003-2012. years have linear trend.The regression analysis results suggest the strong link between the birth rate and the number of students enrolled in the first grade of public primary education, as a priori expected. Moreover, the R square value suggest that over 99 percent of variations number of pupils enrolled in primary schools is explained by the variations in natality, that is changes in the number of newborns in the period under observation. The obtained marginal effect coefficient suggest that if the natality increases by 1000, 95% of the newborns is expected to be enrolled in public schools, on average, ceteris paribus. The results point strongly to the relevance of analyzing natality trends and future projections in policy planning. Moreover, the results suggest the trivial role played private primary schools, in terms of their absorptive capacity. However, we need to be cautious in interpreting the obtained results, taking into account possible mismatched between the number of enrolled populis in relations to their exact birth rate.Given the size of the sample (10), there is no point-it is not possible to conduct validly diagnostic tests, and the results represent the initial results.

4.4 Proposal for restructuring of primary education with respect to demographic changes and costs in the Sarajevo Canton

Based on the presented data on primary education in the Sarajevo Canton, respecting the changes that have occurred in the demographic structure, I suggest the following three proposals for the restructuring:

1. Restructuring of primary education of the Sarajevo Canton according to the pedagogical standards and norms for primary education of the Federation of Bosnia and Herzegovina;
2. Change in the use of the existing primary schools according to the population age structure;

Restructuring of primary education of the Sarajevo Canton according to the pedagogical standards and norms for the primary education of the Federation of Bosnia and Herzegovina is the most realistic activity that could be implemented under current circumstances. This activity could be implemented in two ways:

1) transportation of students by bus from schools that do not meet norms to schools that have the possibility to receive an additional number of students,
2) introduction of triple shifts if possible.

The Municipality of Stari Grad could perform the restructuring in the simplest way. Primary school "Saburina" currently meets the minimum standards as to the area of usable space per student, while in the primary school "Edhem Mulabdić" the number of classes exceeds the optimum.
In order for the primary school "Saburina" to have $4m^2$ of usable space per student it would be optimal for the school to have 350 students, which means that 102 students should be transferred to the nearest primary school, and in this case it would be the primary school "Mula Mustafa Bašeskija". For this to be implemented, it is necessary to provide 3 buses that would transport children to this school every day. The cost of renting a bus for a month amounts to 750.00 KM. This means that the cost of a 9-month lease would be 20,250.00 KM, which needs to be included in the Budget Plan for primary education.

In the Centar Municipality, primary schools "Nafija Sarajlić", "Safvet beg Bašagić" and "Isak Samokovlija" meet the minimum norm as to the usable area per student, which is 3 m^2. In contrast to the above, the primary school "Vladimir Skarić" has 4 times the area compared to the optimum.

If we wanted to increase the usable space per student to 4m^2, the easiest way to achieve this would be to reduce the number of students in the schools that barely meet the norms. It would be necessary to transfer 111 students from the primary school "Nafija Sarajlic", 141 students from "Safvet beg Bašagić" and 161 students from "Isak Samokovlija" to the primary school "Vladimir Skarić" if we wanted to increase their usable space from 3 m^2 to 4 m^2.
In order to implement this kind of activity, it is necessary to provide 8 buses. The cost of nine-month lease would amount to 54,000.00 KM.

In the Municipality of Novo Sarajevo, the primary school "Pofalići" meets the minimum norms of the usable area. Given the changes in vital demographic parameters, there is no need for restructuring.

Primary schools "Dobroševići" and "Behaudin Selmanović" in the Municipality of Novi Grad are below norms in terms of usable area per student, which is 2 m^2. The primary school "Dobroševići" is the most prominent school in the Municipality of Novi Grad. Restructuring the school by operating in three shifts, increasing the number of classes and reducing the number of students per class would lead to an increase in surface area per student. If the usable area per student were to be 3 m^2, the optimum number of students at the school would amount to 330. If we start from this information and the fact that the optimum number of students in class is 25, then there should be 10 classes per shift, i.e. 250 students per shift. By working in three shifts, the school would be able to receive a maximum of 750 students and the norms would be met.

The primary school "Behaudin Selmanović" currently operates in three shifts and the restructuring of the school is unfeasible. In order to meet the minimum requirement of 3m^2 per student, it would be optimal for the school to have 373 students, which means that it is necessary to transfer 247 students to other schools in the Municipality of Novi Grad. Given the current amount of usable area per student, primary schools "Fatima Gunić", "Ćamil Sijarić" and "Džemaludin Čaušević" represent the ideal candidates to accept these students. For this kind of restructuring to be implemented, it is necessary to provide transportation for students i.e. 5 buses, which cost 3,750.00 KM per month.

The norm regarding the minimum usable area per student is met in the municipalities of Ilijaš and Hadžići. The schools there work in two shifts, but the number of classes in the primary schools "6. mart" and "Hasim Spahić" is not in accordance with the norms.

The most difficult situation regarding the standards in the Municipality of Ilidža is in the primary schools "Treća osnovna" and "Sedma osnovna". Both schools work in three shifts. The usable area in the "Sedma osnovna" is below the norm because it is 2 m^2, and the number of classes in the "Treća osnovna" is below the norm because it has 47 classes.
Given the demographic structure of the Municipality of Ilidža, the most effective solution is to build additional school space, which will be discussed later in the paper.

The primary school "Zahid Baručija" in the Municipality of Vogošća does not satisfy the norms regarding the minimum area of usable space per student. Currently, the school is working in two shifts. The introduction of a shift between the existing two, for the students of the first and the second grade, would reduce the number of students in the first and second shift and, accordingly, the usable area per student would increase.

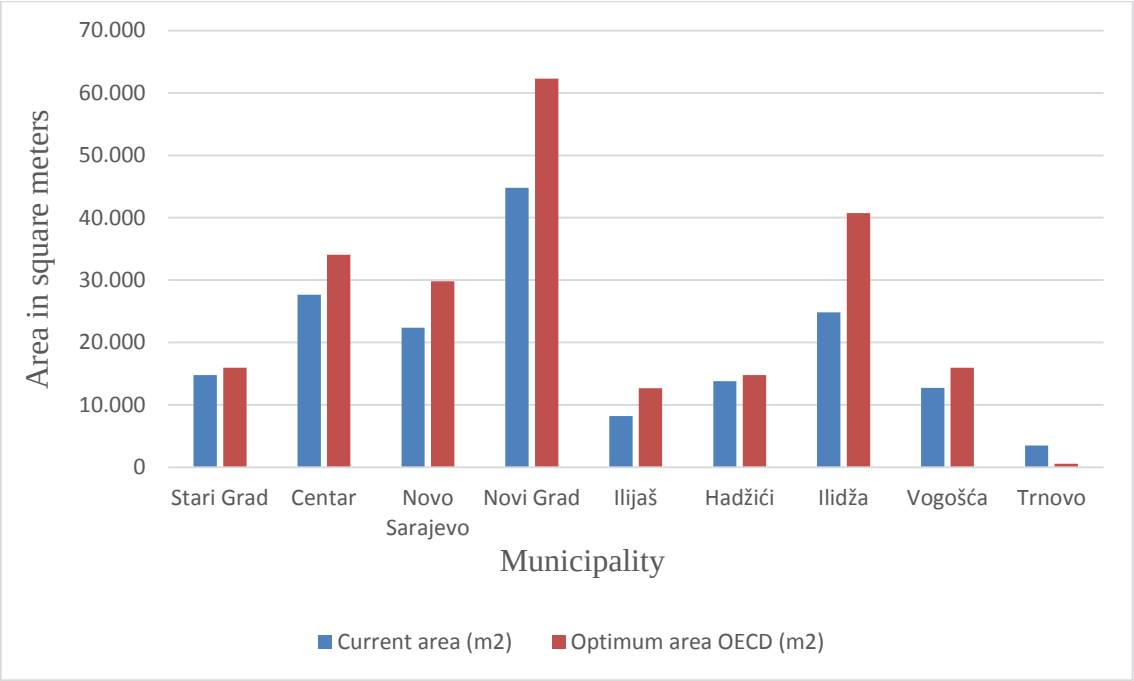
We can conclude that the municipalities of Centar and Novi Grad face the greatest amount of difficulties in the implementation of pedagogical standards and norms for primary education of the Federation of Bosnia and Herzegovina. The problem regarding the minimum usable space per student is particularly emphasized. Compared to the OECD countries and their norms for primary education (working in one shift, 22 students in a class, 6m^2 of usable area per student), the Sarajevo Canton does not meet the standards.

Currently, the classes in the Sarajevo Canton are conducted on an area of 172,716 m^2, and the average area of a school is 2,784 m^2. To meet the norms of OECD countries, it is necessary to construct additional 54,245 m^2 or 19 new schools. The municipalities of Ilidža and Novi Grad are in the greatest need for new schools, - they require12 or 84% of the new schools. The following graphic and tabular data reflect the current situation in primary education in relation to the optimum standards applied in the OECD countries.

Table 17. Optimum area and the number of schools modelled on OECD countries

Municipality:	Current area (m^2)	Optimum area OECD (m^2)	Difference:	Number of schools
Stari Grad	14,793	15,966	1,173	0.4
Centar	27,637	34,086	6,449	2
Novo Sarajevo	22,360	29,832	7,472	3
Novi Grad	44,814	62,280	17,466	6
Ilijaš	8,233	12,672	4,439	2
Hadžići	13,808	14,808	1,000	0.4
Ilidža	24,843	40,752	15,909	6
Vogošća	12,728	15,978	3,250	1
Trnovo	3,500	588	-2,912	-1
Total:	172,716	226,962	54,246	19

Figure 17. Current vs. optimum usable area in municipalities



Given the current economic situation, in order to cover the costs of building material and labor, it is necessary to provide 1,436.00 KM with VAT included for building $1m^2$ of school space. From the above it can be concluded that the cost of construction of an elementary school is 3,997,824.00 KM. The primary education budget for the fiscal year 2014/2015 amounted to 3,071,100.00 KM, which means that the existing budget is not even sufficient to build a single new school.

Primary education in the Sarajevo Canton recorded a decrease in the number of students in the period 2000-2013 and, accordingly, the question is whether it is justified to apply the parameter of OECD countries to the Sarajevo Canton, especially if one takes into consideration the costs of construction and available budget resources.

The Centar Municipality recorded the largest decline in the number of primary school students in the period 2000-2013, which amounted to 22%. The change in the age structure, decrease in purchasing power and growth of consumer prices has led to a drop in natality, which is directly reflected in the number of primary school students.

The Centar Municipality constantly had a negative population growth rate in the period from 2000 to 2013, which was created as a result of majority of older population. The need to accommodate the aging population in the absence of appropriate facilities for that purpose raises the possibility for one primary school in the Centar Municipality to be converted into a nursing home.

CONCLUSION

Monitoring the movement of natality and mortality in the Sarajevo Canton is of great importance for the formation of policies of public education. Enrollment of students in the first grade of primary education is exercised by parents, or legal guardians. The choice of primary schools in which the prospective student is to be enrolled is left to the parents will. Parents can choose whether to enroll their child in a public or private school. The percentage of students who are enrolled in private primary schools is very small, 8% in the Sarajevo Canton.

In the school year 2012/2013, teaching in the Sarajevo Canton was performed in 85 public and private primary schools. In the period 2000/2011 in the Sarajevo Canton there was a drop in the number of primary school students. The biggest drop was recorded in the municipalities of Centre (1123) students, Novi Grad (933) students and Novo Sarajevo (824) students. In the municipalities of Ilidza and Ilijas in the period 2000/2011, the increase in the number of students of primary education was recorded. Changes in the number of students of primary education may be linked to changes in natality. In the municipality of Stari Grad, Centar, Novo Sarajevo and Hadžići, a decline in the number of students of primary education is accompanied by a decline in natality in these municipalities. There are four main reasons for the decline in natality, increased mortality in the municipalities of Stari Grad and Centre: changes in the administrative boundaries of municipalities, the ethnic structure of the population, age structure of the population and negative population growth. The increase of natality, and the decrease of mortality in the municipalities of Ilidža and Ilijaš are accompanied by the growth of the number of students of primary education. It is important to note that in the municipalities of Novi Grad and Vogošća growth in natality, and declining mortality were not accompanied by a growth in students of elementary education.

The natality in the Sarajevo Canton, the city of Sarajevo in the period 1996-2013 has a polynomial downward trend. Mortality in the Sarajevo Canton, the city of Sarajevo in the period 1996-2013 has a linear upward trend. Population growth in the Sarajevo Canton, the city of Sarajevo has polynomial downward trend.
Primary education in Sarajevo Canton is regulated by the Law on Primary Education. This law defines the principles of primary education, pedagogical standards and norms on which the teaching is based in primary schools.

On the basis of pedagogical standards and norms for primary education of the Federation of Bosnia and Herzegovina, which have been accepted and standardized by the Law on Primary Education in the Sarajevo Canton, a primary school can have a minimum of 18 classes, optimally 25 classes and a maximum of 36 classes, if classes are held in two shifts.

The optimum number of students per class is 24, the minimum number of students is 16, and the maximum number of students per class is 30. The optimum classroom surface area per student is 3 m2. In the school year 2010/2011 in the Sarajevo Canton classes were organized in 77 public primary schools. On the basis of pedagogical standards and norms which are valid in the Sarajevo Canton, an analysis of the current situation in the public primary schools was conducted, and it can provide the following conclusions:

1.) 21 of the 77 primary schools of the Sarajevo Canton do not meet the basic pedagogical norms of FB&H,
2). 8 of the 77 primary schools of the Sarajevo Canton operate in three or more shifts,
3). 12 of the 77 primary schools of the Sarajevo Canton have a problem with a minimum surface area of optimum space per student (3 m2),
4). 8 of the 77 primary schools of the Sarajevo Canton have a larger number of classes than permitted by norms, if one takes into account that schools work in two shifts.

It is important to note that the municipalities of Stari Grad, Novo Sarajevo and the Centre which are struggling with depopulation i.e. have more deaths than births, actually best meet these educational norms and standards. Novi Grad and Ilidza which recorded positive population growth i.e. have a higher natality rate than mortality, experience serious difficulties in meeting the pedagogical standards and norms. Therefore, it can be concluded that it is necessary to pay more attention to the trend of natality and mortality in municipalities when planning future policies of primary education in the Sarajevo Canton.

Considering the fact that the enrollment of students in the first grade of primary education, and the choice of a primary school in the Sarajevo Canton is left to the choice and will of parents, we suggest the possibility of restructuring the existing primary schools in the Sarajevo Canton. Restructuring would be carried out on the basis of the applicable pedagogical standards and norms and would be conducted in the following two ways:

1) transportation of students by bus from schools that do not meet norms to schools that have the possibility to receive an additional number of students,
2) introduction of triple shifts if possible.

In the area of the Sarajevo Canton, 12 of the 77 public primary schools meet the two parameters relating to the number of students per class and the area of usable space per student complying with the OECD. If we want to meet the parameter that relates to the area of usable space per student, it would be necessary to build an additional 19 public primary schools. One square meter of school area, according to the current construction prices, costs 1,436 KM, which means that the cost of building a new school would be 3,997,824 KM.

For the purpose of the thesis, a regression analysis between natality and the number of students enrolled in the first grade of primary education in Canton Sarajevo has been made. Natality was taken as an independent variable, while the number of students enrolled in the first grade of public primary education as a dependent variable. The regression model was developed with a "constant term" equal to zero, because this assumption is theoretically feasible. Based on the adjusted value of R2 = 0.99 and the significance of the natality coefficient obtained,, we can conclude there a direct link between natality and enrollment, while over 99 percent of newborns are suggested to be enrolled in public primary schools, therefore pointing to the relevance of analyzing natality trends and future projections in policy planning.

Considering the rivalry that exists between public and private primary schools, it can be concluded (based on the regression model) that the outflow of students in favor of private primary schools is not substantial. Needless to say, we need to be cautious in interpreting the obtained results, taking into account possible mismatched between the corresponding numbers of enrolled pupils and the newborns, in relation to their exact birth rate and the possibility of their enrolment in primary school in the course of 1 and a half years. .

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APPENDICES

TABLE OF APPENDICES

Appendix A: Changes in the total population in the city – Canton of Sarajevo for the period 1996-2013.

Year	Stari Grad	Centar	Novo Sarajevo	Novi Grad	the city of Sarajevo	Ilidža	Vogošća	Hadžići	Ilijaš	Trnovo	the Sarajevo Canton
1996	42,962	71,224	57,155	99,632	270,973	37,629	15,486	23,620	12,524	822	361,054
1997	41,962	66,179	61,850	103,765	273,756	40,100	17,334	19,467	12,878	740	364,275
1998	36,374	65,216	68,058	104,878	274,526	42,025	18,045	19,083	13,942	748	368,369
1999	37,396	66,044	69,436	110,086	282,962	44,491	18,799	19,401	14,471	759	380,883
2000	37,773	67,430	71,932	112,838	289,973	46,020	19,388	19,608	14,744	801	390,534
2001	38,149	68,173	74,471	116,288	297,081	47,502	19,852	19,964	15,249	850	400,498
2002	38,167	68,151	74,493	116,588	297,399	47,654	19,966	20,133	15,325	839	401,316
2003	38,211	68,067	74,402	116,832	297,512	47,924	19,966	20,133	15,325	836	401,696
2004	38,106	67,974	74,364	117,079	297,523	48,105	20,054	20,251	15,414	819	402,166
2005	38,000	70,294	73,381	119,883	301,558	48,291	20,575	21,958	15,462	2,187	410,031
2006	37,976	70,289	73,319	122,491	304,075	48,387	20,605	22,014	16,982	2,183	414,246
2007	37,917	70,143	73,268	122,737	304,065	52,374	20,697	22,140	17,572	2,182	419,030
2008	37,832	70,203	73,379	123,200	304,614	52,896	21,108	22,379	17,738	2,554	421,289
2009	37,737	70,099	73,371	124,035	305,242	53,600	21,595	22,636	18,048	2,524	423,645
2010	42,580	69,889	73,394	124,742	310,605	59,271	23,038	22,727	18,436	2,495	436,572
2011	42,509	69,673	73,584	125,395	311,161	60,060	23,470	22,705	18,928	2,433	438,757
2012	42,220	69,156	73,748	125,447	310,571	60,417	25,450	22,731	19,102	2,473	440,744
2013	42,031	68,933	73,820	125,626	310,410	61,160	25,882	22,777	19,590	2,850	442,669

Source: *Demograhic analysis of the Sarajevo Canton by municipalities in the period 1996-2005*, p. 5, Table 1

Appendix B: Changes in natality in the city – Canton of Sarajevo

Year	Stari Grad	Centar	Novo Sarajevo	Novi Grad	the city of Sarajevo	Ilidža	Vogošća	Hadžići	Ilijaš	Trnovo	the Sarajevo Canton
1996	676	942	749	1014	3,381	257	119	277	120	0	4,154
1997	605	854	960	1283	3,702	768	231	291	249	4	5,245
1998	519	825	906	1178	3,428	723	216	307	214	2	4,890
1999	550	709	770	1315	3,344	628	188	278	183	0	4,621
2000	554	665	714	1215	3,148	468	189	254	201	8	4,268
2001	450	603	661	1072	2,786	517	176	223	1263	13	4,978
2002	398	627	612	1097	2,734	519	176	225	181	9	3,844
2003	403	599	577	990	2,569	644	215	257	173	22	3,880
2004	326	570	564	1001	2,461	572	232	267	231	6	3,769
2005	361	595	604	1107	2,667	636	216	260	213	9	4,001
2006	370	641	572	1133	2,716	648	224	295	224	11	4,118
2007	358	595	606	1168	2,727	655	247	301	226	12	4,168
2008	343	592	614	1278	2,827	710	298	255	227	8	4,325
2009	438	672	654	1350	3,114	748	317	276	271	18	4,744
2010	397	626	676	1354	3,053	748	326	133	449	19	4,728
2011	359	613	711	1384	3,067	711	301	100	422	11	4,612
2012	380	600	659	1490	3,129	716	306	229	335	6	4,721
2013	354	583	672	1314	2,923	693	327	249	270	15	4,477

Source: *Demograhic analysis of the Sarajevo Canton by municipalities in the period 1996-2005,* p. 15, Table 13

Appendix C: Changes in mortality in the city – Canton of Sarajevo

Year	Stari Grad	Centar	Novo Sarajevo	Novi Grad	the city of Sarajevo	Ilidža	Vogošća	Hadžići	Ilijaš	Trnovo	the Sarajevo Canton
1996	383	589	434	642	2048	231	82	93	78	6	2538
1997	416	651	541	700	2308	308	102	119	98	10	2945
1998	391	653	582	613	2239	264	111	140	92	39	2885
1999	402	614	589	615	2220	323	98	153	107	28	2929
2000	415	702	637	880	2634	366	146	165	110	15	3436
2001	446	696	651	864	2657	364	139	155	97	28	3440
2002	379	647	589	793	2408	367	134	134	153	20	3216
2003	359	683	668	746	2456	374	143	179	125	25	3302
2004	431	663	602	854	2550	391	144	149	132	23	3389
2005	443	655	655	897	2650	385	157	182	144	20	3538
2006	422	640	643	868	2573	395	163	173	159	21	3484
2007	417	741	657	922	2737	400	155	175	136	13	3616
2008	423	640	702	921	2686	456	173	161	154	16	3646
2009	430	697	647	980	2754	459	190	176	162	36	3777
2010	440	707	758	935	2840	460	192	199	170	31	3892
2011	407	731	706	969	2813	502	182	235	171	24	3927
2012	395	733	635	964	2727	437	170	214	169	30	3747
2013	464	700	665	1016	2845	498	200	194	154	44	3935

Source: *Demograhic analysis of the Sarajevo Canton by municipalities in the period 1996-2005*, p. 15, Table 15

Appendix D: Changes in natural population growth in the city – Canton of Sarajevo

Year	Stari Grad	Centar	Novo Sarajevo	Novi Grad	the city of Sarajevo	Ilidža	Vogošća	Hadžići	Ilijaš	Trnovo	the Sarajevo Canton
1996	293	353	315	372	1333	26	37	184	42	-6	1616
1997	189	203	419	583	1394	460	129	172	151	-6	2300
1998	128	172	324	565	1189	459	105	167	122	-37	2005
1999	148	95	181	700	1124	305	90	125	76	-28	1692
2000	139	-37	77	335	514	102	43	89	91	-7	832
2001	4	-93	10	208	129	153	37	68	1166	-15	1538
2002	19	-20	23	304	326	152	42	91	28	-11	628
2003	44	-84	-91	244	113	270	72	78	48	-3	578
2004	-105	-93	-38	147	-89	181	88	118	99	-17	380
2005	-82	-60	-51	210	17	251	59	78	69	-11	463
2006	-52	1	-71	265	143	253	61	122	65	-10	634
2007	-59	-146	-51	246	-10	255	92	126	90	-1	552
2008	-80	-48	-88	357	141	254	125	94	73	-8	679
2009	8	-25	7	370	360	289	127	100	109	-18	967
2010	-43	-81	-82	419	213	288	134	-66	279	-12	836
2011	-48	-118	5	415	254	209	119	-135	251	-13	685
2012	-15	-133	24	526	402	279	136	15	166	-24	974
2013	-110	-117	7	298	78	195	127	55	116	-29	542

Source: *Demograhic analysis of the Sarajevo Canton by municipalities in the period 1996-2005*, p. 16, Table 17

Appendix E: Changes of the vital index in the city – Canton of Sarajevo

Year	Stari Grad	Centar	Novo Sarajevo	Novi Grad	the city of Sarajevo	Ilidža	Vogošća	Hadžići	Ilijaš	Trnovo	the Sarajevo Canton
1996	176.50	159.93	172.58	157.94	165.09	111.26	145.12	297.85	153.85	0.00	163.67
1997	145.43	131.18	177.45	183.29	160.40	249.35	226.47	244.54	254.08	40.00	178.10
1998	132.74	126.34	155.67	192.17	153.10	273.86	194.59	219.29	232.61	5.13	169.50
1999	136.82	115.47	130.73	213.82	150.63	194.43	191.84	181.70	171.03	0.00	157.77
2000	133.49	94.73	112.09	138.07	119.51	127.87	129.45	153.94	182.73	53.33	124.21
2001	100.90	86.64	101.54	124.07	104.86	142.03	126.62	143.87	1302.06	46.43	144.71
2002	105.01	96.91	103.90	138.34	113.54	141.42	131.34	167.91	118.30	45.00	119.53
2003	112.26	87.70	86.38	132.71	104.60	172.19	150.35	143.58	138.40	88.00	117.50
2004	75.64	85.97	93.69	117.21	96.51	146.29	161.11	179.19	175.00	26.09	111.21
2005	81.49	90.84	92.21	123.41	100.64	165.19	137.58	142.86	147.92	45.00	113.09
2006	87.68	100.16	88.96	130.53	105.56	164.05	137.42	170.52	140.88	52.38	118.20
2007	85.85	80.30	92.24	126.68	99.63	163.75	159.35	172.00	166.18	92.31	115.27
2008	81.09	92.50	87.46	138.76	105.25	155.70	172.25	158.39	147.40	50.00	118.62
2009	101.86	96.41	101.08	137.76	113.07	162.96	166.84	156.82	167.28	50.00	125.60
2010	90.23	88.54	89.18	144.81	107.50	162.61	169.79	66.83	264.12	61.29	121.48
2011	88.21	83.86	100.71	142.83	109.03	141.63	165.38	42.55	246.78	45.83	117.44
2012	96.20	81.86	103.78	154.56	114.74	163.84	180.00	107.01	198.22	20.00	125.99
2013	76.29	83.29	101.05	129.33	102.74	139.16	163.50	128.35	175.32	34.09	113.77

Appendix F: Overview of all the primary schools in the Sarajevo Canton for the school year 2010/2011.

No.	Primary school	Address	Students	Classes	S/C	Shift	Area	A/S
Municipality Stari Grad								
1	„Vrh Bosna“	Baruthana 60	274	14	19.57	2	1,279	5
2	„Hamdija Kreševljaković“	Carina 2	386	18	21.44	2	2,774	7
3	„Šejh Muhamed ef. Hadžijamaković“	Iza Hrida 11	392	18	21.78	2	1,808	5
4	„Saburina“	Saburina 4	453	21	21.57	3	1,397	3
5	„Mula Mustafa Bašeskija“	Logavina 52	452	21	21.52	2	2,553	6
6	„Edhem Mulabdić“	Konak 1	704	33	21.33	2	4,982	7
TOTAL:			2.661	125	21,29	///	14.793	5
Municipality Centar								
1	„Katolički školski centar“	Mehmed paše S.	881	37	23.81	2	4,127	5
2	„Hasan Kaimija“	Cicin Han 93	267	14	19.07	2	1,978	7
3	„Nafija Sarajlić“	Patriotske lige 57	611	26	23.50	2	2,000	3
4	„Mehmed beg Kapetan Ljubušak“	Braće Begića 19	433	19	22.79	2	2,500	6
5	„Slivije Strahimir Kranjčević“	Mehmed paše S. 2	223	12	18.58	2	1,171	5
6	„Safet beg Bašagić“	Gimnazijska 1	567	23	24.65	2	1,704	3
7	„Musa Ćazim Ćatić“	Čekaluša 53	678	29	23.38	2	3,029	4
8	„Alija Nametak“	Zaima Šarca 15	801	33	24.27	2	3,500	4
9	„Hasan Kikić“	Gorica 27	262	13	20.15	2	2,439	9
10	„Vladimr Skarić“	Terezija 48	241	11	21.91	1	2,964	12
11	„Isak Samokovlija“	Fra Anđela Zvizdića“	717	29	24.72	2	2,225	3
TOTAL:			5.681	246	22,44	////	27.637	6

table continues

continued

No.	Primary school	Address	Students	Classes	S/C	Shift	Area	A/S
Municipality Novo Sarajevo								
1	„Kovačići“	Zagrebačka 22a	519	25	20.8	2	2,900	6
2	„Velešićkih Heroja“	Velešići 2	473	22	21.5	2	2,114	4
3	„Pofalići“	Ivanjska 1	657	30	21.9	2	1,950	3
4	„Grbavica 2“	Behdžeta Mutevelića	718	28	25.6	2	3,800	5
5	„Grbavica1“	Grbavička 14	432	21	20.6	2	2,677	6
6	„Hrasno“	Porodice Ribara 2	847	33	25.7	2	3,786	4
7	„Malta“	Marka Marulića 27	564	26	21.7	2	2,418	4
8	„Čengić Vila 1“	dr. Fetaha B.	762	32	23.8	4	2,715	4
TOTAL:			4.972	217	22,7	///	22.360	5
Municipality Novi Grad								
1	Avdo Smailović	Adema Buće 151	1088	45	24.2	2	3,961	4
2	„Umihana Čuvidina“	Smaila Šikala 1	1003	44	22.8	4	3,260	3
3	„Osman Nuri Hadžić“	Lava Tolstoja 6	533	26	20.5	1	2,608	5
4	„Ćamil Sijerić“	Braće Mulića 16	647	27	24	2	3,800	6
5	„Skender Kulenović“	Buleva M. Sinana	856	37	23.1	2	3,901	5
6	„Aleksa Šantić“	Bramislava Nušića	899	38	23.7	2	4,500	5
7	„Fatima Gunić“	Merkeza Smailagića	804	32	25.1	2	4,434	6
8	„Meša Selimović“	Geteova 16	739	32	23.1	2	3,200	4
9	„Džemaludin Čaušević“	Prvomajska 24	566	26	21.8	2	3,480	6
10	„Behludin Selmanović“	Viteška 2	620	27	23	3	1,117	2
11	„Mehmedalija Mak Dizdar“	Žrtava Fašizma 14	750	30	25	2	3,002	4
12	„Osman Nakaš“	Gradačačka 39	612	25	24.5	2	3,143	5
13	„Dobroševići“	Ahatovićka 41	565	23	24.6	2	991	2
14	„Sokolje“	Numan paše Ćuprilića	698	28	24.9	2	3,417	5

table continues

continued

TOTAL:			10.380	440	23.6	///	44.814	4
No.	Primary school	Address	Students	Classes	S/C	Shift	Area	A/S
Municipality Ilijaš								
1	„Srednje“	Srednje bb	270	11	24.5	1	2,145	8
2	PŠ „Gajevi“	selo Gajevi	14	2	7	1	120	9
3	PŠ „Dragoradi“	selo Dragoradi	6	1	6	1	240	40
4	PŠ“Kamenica“	selo Kamenica	39	2	19.5	1	188	5
5	„Podlugovi“	Polomska 189	509	24	21.2	2	2,300	5
6	PŠ „Ljubnići“	selo Ljubnići	31	2	15.5	1	///	0
7	PŠ „Lješevo“	selo Lješevo	25	2	12.5	1	///	0
8	Hašim Spahić“	Krajiška bb	1110	48	23.1	2	3,240	3
9	PŠ „Misoča“	selo Misoča	47	3	15.7	2	///	0
10	PŠ „Malešići“	selo Malešići	49	3	16.3	2	///	0
11	PŠ „Bioča“	selo Bioča	12	2	6	1	///	0
TOTAL:			2.112	100	15,2		8.233	4
Municipality Hadžići								
1	„Hilmi ef. Šarić“	Bratsva Jedinstva 38	587	28	20.96	2	2,600	4
2	PŠ „Korača“	selo Korača	12	1	12	2		0
3	PŠ „Raštelica“	selo Raštelica	17	2	8.5	2		0
4	„9 Maja“	„Bjelašnička 59“	511	24	21.29	2	6,642	13
5	PŠ „Lokve“	selo Lokve	21	2	10.5	1		0
6	„6. Mart“	„Anđelka Lažetića 5“	1245	53	23.49	3	4,566	4
7	PŠ „Binježevo“	selo Binježevo	75	5	15	2		0
TOTAL:			2.468	115	16	///	13.808	6

table continues

continued

No.	Primary school	Address	Students	Classes	S/C	Shift	Area	A/S
Municipality Ilidža								
1	„Prva osnovna škola“	Mala Aleja 15	742	31	23.94	2	2,650	4
2	„Druga osnovna škola“	Školska 1	751	32	23.47	3	3,291	4
3	„Treća osnovna škola“	Nasiha Kapidžić Hadžić	1.138	47	24.21	3	3,396	3
4	„Osjek“	Osjek	304	13	23.38	3		0
5	„Četvrta osnovna škola“	Put Famosa	376	19	19.79	2	2,275	6
6	„Peta osnovna škola“	Umihana Čuvidina 58	777	34	22.85	3	2,816	4
7	„Šesta osnovna škola“	Bare kod Stupa 63	549	23	23.87	2	2,160	4
8	„Sedma osnovna škola“	Blažuje 118	686	29	23.66	3	1,335	2
9	„Osma osnovna škola“	Ilirska 2	553	23	24.04	2	3,000	5
10	„Deveta osnovna škola“	„Rakovička cesta 339“	506	23	22	2	2,443	5
11	PŠ „Katolički školski centar“ Stup		410	18	22.78	2	1,477	4
TOTAL:			6.792	292	23,2	///	24.843	4
MunicipalityVogošća								
1	„Mirsad Prnjavorac“	Jošanika 51	827	34	24.3	2	3,614	4
2	„Zahid Baručija“	Omladinska 14	496	21	23.6	2	1,064	2
3	„Porodice ef. Ramića“	Nova cesta 62	402	20	20.1	2	2,060	5
4	PŠ“Gora“	selo „Gora“	9	1	9	1		0
5	„Izet Šabić“	Donji Hotonj bb	457	20	22.9	2	2,315	5
6	„Zajko Delić“	Slatinski put 3	472	21	22.5	2	3,675	8
TOTAL:			2.663	117	20,4	///	12.728	4

table continues

continued

No.	Primary school	Address	Students	Classes	S/C	Shift	Area	A/S
Municipality Trnovo								
1	„Zaim Kolar“	Husremova bb – Dejčići	90	10	9	1	3,500	39
2	PŠ „Delijaši“	selo Delijaši	8	2	4	1	////	0
3	PŠ "Šabići"	selo Šabići	////	///		///	////	0
TOTAL:			98	12	6.5	///	3,500	0

Source: *Primary education of Canton Sarajevo for school year 2010/2011.*, p. 27, Table 27

Appendix G: Regression analysis of the number of students enrolled in the first grade compared to the natality

Regression Statistics	
Multiple R	0,99635239
R Square	0,992718085
Adjusted R Square	0,881606974
Standard Error	373,4761403
Observations	10

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	171138831,2	171138831,2	1226,938622	4,82797E-10
Residual	9	1255359,846	139484,4274		
Total	10	172394191			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
X Variable 1	0,956401107	0,027304149	35,02768366	6,22562E-11	0,89463483	1,018167385	0,89463483	1,018167385