VELEUČILIŠTE VELIKA GORICA
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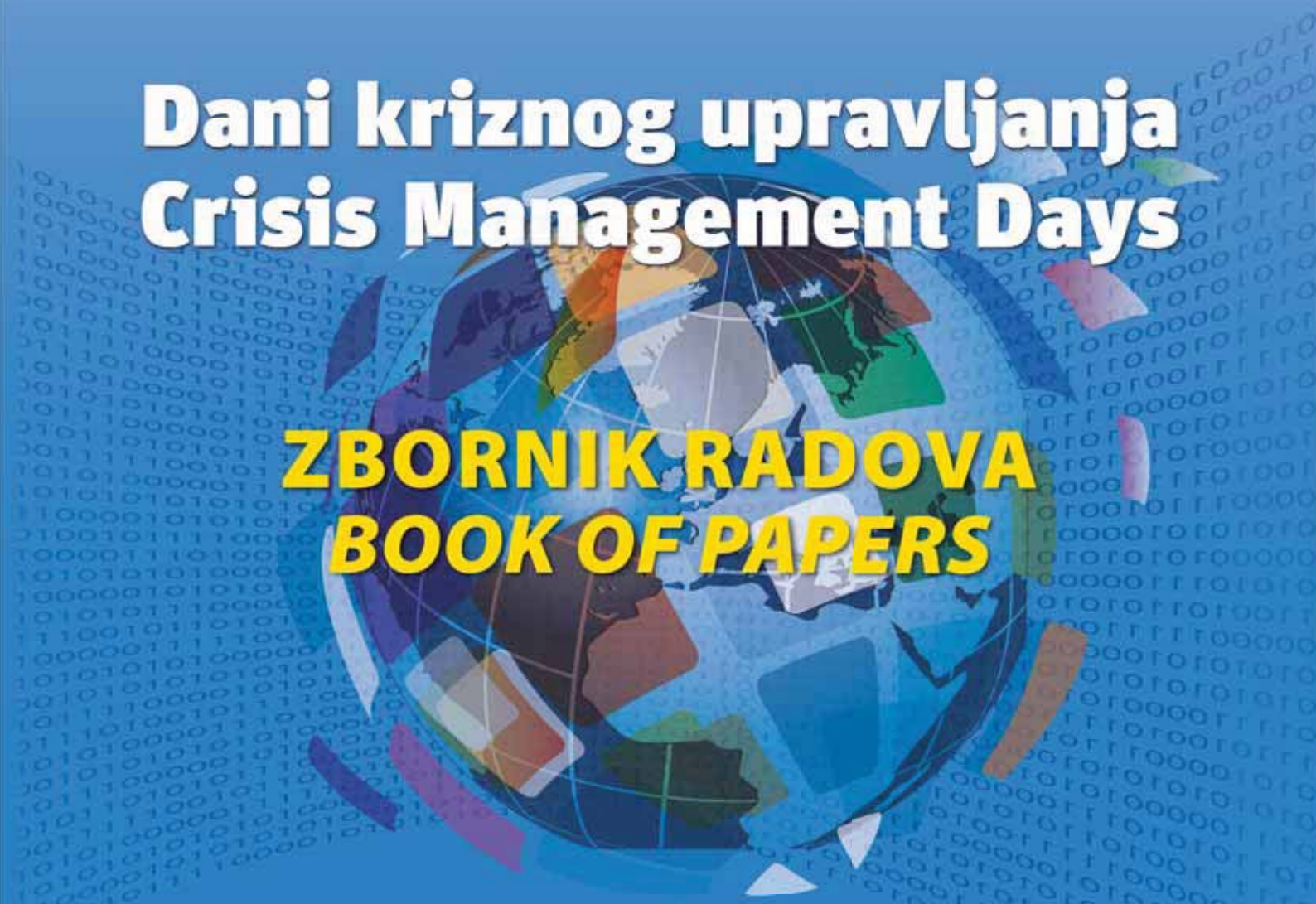
DKU
Dani kriznog upravljanja
Crisis Management Days

8. MEĐUNARODNA ZNANSTVENO-STRUČNA KONFERENCIJA
8th INTERNATIONAL SCIENTIFIC CONFERENCE

Dani kriznog upravljanja
Crisis Management Days



ZBORNIK RADOVA
BOOK OF PAPERS

14. i 15. svibnja 2015.
Velika Gorica, Hrvatska

14 and 15 May 2015
Velika Gorica, Croatia

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UTJECAJ POPLAVA NA KVALITETU ŽIVOTA GRAĐANA HRVATSKE I SRBIJE: POLA STOLJEĆA POSLIJE

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Sažetak

Poplave su na teritorijama Republike Hrvatske i Republike Srbije relativno česta pojava. Pre pola stoleća, tačnije 1964. godine dogodile su se velike poplave na teritoriji tadašnje SR Hrvatske, kada se izlila reka Sava i naredne godine u SR Srbiji, kada su se izlili Dunav i Tisa. Prošle godine (2014. godine), dogodile su se poplave u Hrvatskoj i Srbiji, kada je nekoliko desetina građana izgubilo svoje živote. Autori će pokušati u radu da kvantitativnom analizom utvrde nivo kvaliteta života građana ovih dveju država u razmaku od 50 godina i uticaj poplava na kvalitet života građana, nivo nastale štete, gubitak života i druge varijable koje su od značaja za utvrđivanje odnosa kvaliteta života i kvantiteta nastale štete. Kvalitet života biće prikazan pomoću kvantitativnih pokazatelja, kao što je npr. BND per capita.

Ključne riječi: poplave, kvalitet života, šteta, varijabla

1. INTRODUCTION

The purpose of this paper is to identify and collect data about historically important floods on the territory of the Republic of Croatia and the Republic of Serbia and to identify the impact of floods on the quality of life of the citizens. Floods, as kind of natural disaster which in main cause huge damages, have negative impact and inflict large number of problems for citizens in areas where floods were. In recovery phase countries affected by floods need a lot of different resources to back whole elementary part of people life in normally. Probably, citizens for some period of time could not live as before floods. They need time, funds and so more to obtain quality of life as they had before flood appearing. The occurrence of natural disasters has increased in frequency across the globe over the past 50 years. Estimates of the economic and financial losses from natural disasters have also risen. Many researchers have found that floods have a significant negative impact on growth on the country level. The impact of floods on an economy will depend on many factors like the nature of the shock, the size and structure of the economy, population concentration, per capita income, financial depth, governance, and openness (Laframboise and Loko, 2012). In the short term, disasters typically result in a contraction in economic output and a worsening in external and fiscal balances. Besides negative impact of floods on the governance economy, both in short-term and long-term, this paper highlights the negative consequences of this kind of disaster on quality of life of any citizen in flooded area. Floods can have a significant negative impact over the long term on poverty and social welfare. The poor have limited savings and access to credit, so are not able to supplement their incomes following a crisis. This can drive households into "poverty traps" with negative health and social effects (Hallegatte and Przyluski, 2010). Indeed, disasters have been found to have long-lasting consequences on psychological health and cognitive development (Norris, 2005; Santos, 2007). In this paper, after analysis of diffe-

rent definitions about quality of life with accent on the dimensions which will be used for the purpose of this paper, we deliberately focus on the floods before fifty years and in the last year in Croatia and Serbia with the main emphasis on the impact of floods on all dimensions of quality of life. The purpose of our research is to determine quality of life of the citizens of those two countries in the span of 50 years before and after catastrophic floods and to provide recommendations for improving the quality of life of citizens through reducing the risk of floods.

2. QUALITY OF LIFE: DEFINITIONS, DIMENSIONS AND USES

The quality of life of a population is an important concern in economics and political science. It is measured by many social and economic factors. A large part is standard of living, the amount of money and access to goods and services that a person has; these numbers are fairly easily measured. Others like freedom, happiness, art, environmental health, and innovation are very hard for measuring. This has created an inevitable imbalance as programs and policies are created to fit the easily available economic numbers while ignoring the other measures that are very difficult to plan for or assess (Young, 2008). According to now, exist many different definitions of quality of life. Empirical study of quality of life is more than simply an intellectual exercise. It is a purposeful effort by people to understand the fundamental concerns of societies. Accordingly, the quality of a society can only be determined by measurement or asking the principal question:" Is society improving or is it deteriorating?"(Diener and Suh, 1997). World Health Organization defines quality of life as individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a wide ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, personal beliefs and their relationship to salient features of their environment (World Health Organization, 1997). OECD defines quality of life as the set of non-monetary attributes of individuals that shapes their opportunities and life chances, and has intrinsic value under different cultures and contexts (OECD, 2013). It is very hard to choose the most appropriate definition, but according to goal of this paper very useful is definition of European Commission, more precisely of Eurostat, the statistical office of the European Union. They defines quality of life as broad concept that include a number of different dimensions by which can be understand the elements or factors making up a complete entity, that can be measured through a set of sub-dimensions with an associated number of indicators for each. Quality of life may be measured by different dimensions. OECD uses next dimensions for measuring quality of life: health status, work and life balance, education and skills, social connections, civil engagement and governance, environmental quality, personal security, subjective well-being (OECD, 2011). Swain, a practitioner rather than an academician, stresses that: "Indicators are not objective in any sense of the word, although many of them derive from 'objective' data." He also gave one interesting example for measuring quality of life and explained that reports about crime may serves as useful source of data because the FBI's Uniform Crime Report yields measures on 'actual crime' rates (burglary, assaults, etc.), while annual telephone interviews provides measures on 'people's fears of crime,' both of which are important, and can give view of people live (Swain, 2002). Based on academic research and several initiatives, Eurostat gives 8+1 dimensions as an overarching framework for the measurement of well-being, but also with special focus on Gross domestic product, GDP. GDP is the most common measure of the economic activity of a region or a country at a given time; many decision and policy makers use it as the standard benchmark, often basing their decisions or recommendations on it. It includes all final goods and services an economy produces and provides a snapshot of its performance.

Ideally, they should be considered simultaneously, because of potential trade-offs between them:

- Material living conditions (income, consumption and material conditions),
- Productive or main activity,
- Health,
- Education,
- Leisure and social interactions,
- Economic and physical safety,
- Governance and basic rights,
- Natural and living environment,
- Overall experience of life.

Measuring quality of life is very important, for all intents and purposes, nearly everyone. Interested citizens use them to weigh and understand the position and status of issue areas via their accompanying indicators. Policymakers use it for the same reasons, but equally important, they use this concept to guide their decision making. Also, it is important for giving focus to gaps or problems that exist, allow for recognition of appropriate linkages, assist in determining priorities, and help in deciding what should be done for improvement purposes. This is very important in cases such as floods, where occur many problems and declines in resources. Determining gaps of quality of life between time period before and after flood would give opportunity for decision makers to decide how to back previous conditions of lives by priorities.

3. FLOODS IN THE REPUBLIC OF CROATIA AND REPUBLIC OF SERBIA DURING 1964, 1965 AND 2014 IN BRIEF

The most catastrophic flood of Zagreb caused by the Sava River occurred on 26 October 1964. The river embankment was destroyed in several places and water flooded about 60 km^2 of Zagreb region, as well as the settlements of Zaprešić, Samobor, Dugo Selo, and Velika Gorica. Its maximum discharge was 3.126 m^3/s and maximum stage measured at Zagreb gauging station at the Sava River at km 702-8, was 514 cm. Water level was 117-40 m above the present sea level (a.s.l.), which is 69 cm higher than during the second biggest flood, which occurred on 24 September 1933, when the maximum discharge was 2.877 m^3/s (Bonacci and Ljubenkov, 2007). It should be noted that accuracy of high discharges definition varies between ±5% and ±10%. The flood of 1964 caused serious damages.

High waters of the Danube in 1965 occurred in four main big waves. The first rising in water level occurred in the third week of the March and at the end of the same month sparked the start of regular flood defense at the top of the Serbian's part of the Danube. After the culmination of this wave during the first days of April, and only from the confluence of the Drava approached, and near settlement Bezdan reached the height at which begins an extraordinary defense, there was a decline in water levels. In the third decade of April, the water level rises again and culminates in the first days of May, the same amount that he had the first wave. After a small decline appeared a third wave, which is at mid of the may caused the beginning of extraordinary defense downstream from the confluence of the Drava, and on May 20th same situation was at whole Danube stretch downstream of the confluence of the Drava. The third wave culminated in late May when the height in the Bezdan, Apatin and Novi Sad quite close before seen between the absolute maximum, in town of Bačka Palanka a former maximum was reached, and in Vukovar and Bogojevo exceeded. After a short and very small decline in water came the fourth longest and largest wave of the Danube, which culminated in late June with unrecorded and unprecedented level of water not only in Serbia upstream from the confluence of the river of Tisa, but also in Hungary. The water level is extremely slowly declined so in Serbia emergency flood protection stretched to the second half of July, except downstream from the confluence of the Tisa, where the decline was faster and extraordinary defense stopped earlier (Jeftić, 2010). It is very important to mention that main flood defense took 106 days and during that time period on the few places Danube broke river banks. Consequences were terrible because of number of victims, many people lost their homes and similar. The upper flow of the Tisa not only in Hungary, but not in Serbia do not have extraordinary defense. Probably all the absolute maximums observed on the Danube in 1965 would have been higher, estimated about at up to 20 - 30 cm, that there has been five breakthrough at the four flooded areas near regional propulsion of Bačka Palanka. It is fortunate that major waters of rivers Tisa, Sava and Morava were not coincided with the high waters of the Danube. Otherwise there would be another major disaster.

The flooding in Serbia and Croatia, which occurred in the middle of May 2014 after a three months amount of rain fell onto the region in just three days, had devastating impacts. The heaviest rainfall since records began 120 years ago caused an extreme increase of water levels in the rivers, some exceeding ever recorded maximums. The floods have firstly occurred along the rivers with smaller catchments. At the left Sava bank, floods occurred in the Orljava river basin. Right tributaries of the Sava river – the Bosna, Vrbas and Una rivers caused flooding and great loss in the area. Additional damage was caused by landslides. The Drina river basin suffered from flooding and landslides causing extreme damage. Several settlements in the Kolubara river basin were flooded, where the

town of Obrenovac suffered the most after it was impounded by water several meters deep in the city centre. Enormous inflow from the right bank tributaries lead to a fast increase of the Sava water levels as of May 15, in the bordering sections between Bosnia and Herzegovina and Croatia and in Serbia. On May 17, the Sava River breached left-bank levee at two locations, flooding several settlements and agricultural land in eastern Croatia. The downstream breach occurred just about 5 km and the upstream breach near the Rajevo Selo 25 km from the state border, so the flood water progressed over flat areas towards lower terrain in Serbia and flooded agricultural areas and one village there as well. Besides the devastating effects of flood water, additional danger presented flooding of the areas suspected to contain mines in Bosnia and Herzegovina and in Croatia, potential spread and dislocation of mines, risk of water contamination, epidemics, as well as landslides which continued to pose further risk in hilly areas after the flooding (International Sava River Basin Commission, 2014).

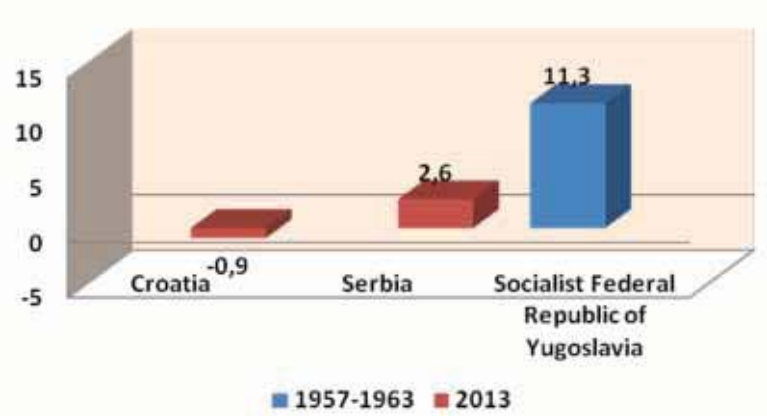
Figure 1. Map of flooding area, May 2014

Source: International Sava River Basin Commission, 2014

4. QUALITY OF LIFE IN THE REPUBLIC OF CROATIA AND REPUBLIC OF SERBIA BEFORE FLOODS IN 1964, 1965 AND 2014

In this part of paper whole dimensions of quality of life, which we described above, will be analyzed in years before floods in Croatia and Serbia. The Socialist Republic of Croatia and Socialist Republic of Serbia in 1963, one year before catastrophic floods on that territory, were part of the Socialist Federal Republic of Yugoslavia. Estimation is that GDP of whole country was about 130 US dollars per capita, calculated on the value of the dollar in 1986 and based on data on the purchasing power of dollars (Latifić, 1997). In 2013 the Republic of Croatia on 1 July 2013 took place as member of the European Union, while Serbia in this year was at the stage of accession to this community. As shown on the graph below the average annual growth of GDP of the Socialist Republic of Croatia and Socialist Republic of Serbia, in frame of the Socialist Federal Republic of Yugoslavia, says that during period 1957-1963, just before the floods, was 11,3 %. In 2013 the Republic of Croatia had a slight decline of the annual growth of GDP, and the Republic of Serbia recorded slight increase.

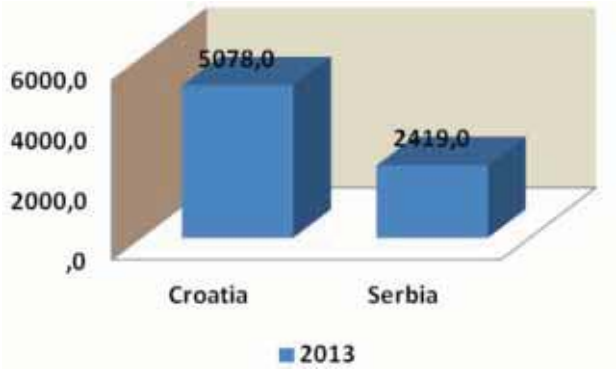
Graph 1.: GDP growth (annual %)



Source: http://ec.europa.eu/eurostat/statisticsexplained/index.php/Quality_of_life_indicators_-_measuring_quality_of_life (10.02.2015.)

According to the World Bank's gross national income in the Socialist Federal Republic of Yugoslavia in the early sixties was in the center of the group of 124 developed and most developed countries and occupied 88th place among those countries. The following graph shows how situation was with indicator of national income in 2013 in Croatia and Serbia.

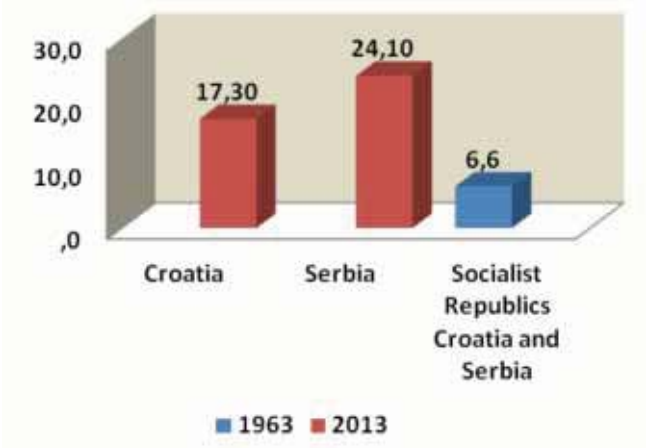
Graph 2.: Median equivalised net income in Euros



Source: http://ec.europa.eu/eurostat/statisticsexplained/index.php/Quality_of_life_indicators_-_measuring_quality_of_life (10.02.2015.)

Unemployment rate of working-age population (from 15 to 74 years) is appropriate indicator of productive and main activity. In 1963 the Socialist Republic of Croatia and Socialist Republic of Serbia had an average value of 6.6%, while the Republic of Croatia in 2013 had unemployment rate 17% and the Republic of Serbia 24.1%.

Graph 3.: Unemployment rates in percentage



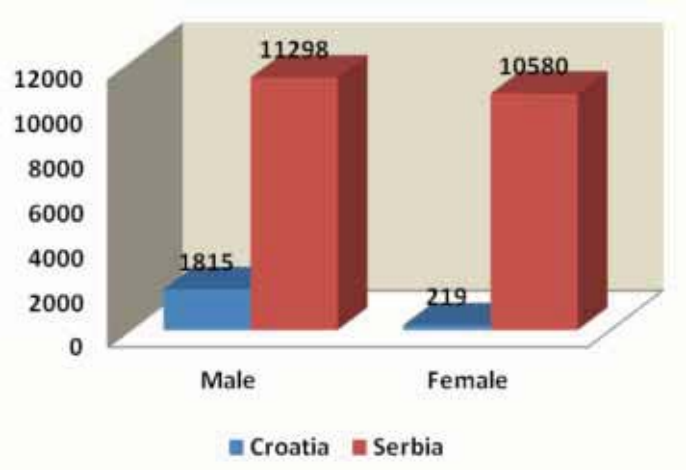
Source: http://ec.europa.eu/eurostat/statisticsexplained/index.php/Quality_of_life_indicators_-_measuring_quality_of_life (10.02.2015.)

The next dimension of quality of life which will be analyzed before and after floods is health. The health care of the population in Croatia and Serbia before the Second World War, was on very low level. Main efforts in post-war Yugoslavia were in the modernization of medical institutions, the establishment of medical personnel, as well as

in the application scientific advances in the treatment and control of diseases. In the Socialist Republic of Croatia and Socialist Republic of Serbia, in the early sixties, measures have been taken to provide health care for the largest part of the population. Since 1959 has been provided health insurance for farmers and their families, so the entire population in Croatia and Serbia had health care which was the general social interest in order to preserve health and working ability (Latifić, 1997). According to Third European Quality of Life Survey (EQLS), on average, Croatians rate their satisfaction with their health as 7.3 on a scale of 1 to 10. While the average for the European Union is also 7.3, the scores range from 6.5 in Latvia to 8.4 in Cyprus. Croatia has the lowest self-reported health satisfaction level of the seven enlargement countries included in the EQLS (European Foundation for the Improvement of Living and Working Conditions, 2012:3). In 2013 18.2% of citizens in Serbia did not receive health care although had a need for it, while the long wait to health care often is a problem in comparison with inability to reach health care due to distance. 16.6% of Serbian citizens have not achieved the need for health care due to waiting too long on the appointment or visit, while 5.7% citizens mentioned problems with transportation to the place of health care delivery (Ipsos Strategic Marketing, 2013).

The fourth dimension of quality of life, which Eurostat recommends during analyzing, is education. In the early sixties almost 3 million children reached primary schools in the Socialist Federal Republic of Yugoslavia. However, there were significant differences between individual regions of the country, both by the number of illiterates, and by the number of educated population. Economically more developed and richer regions at west and north of the country, as Croatia and Serbia had significantly more developed school network and better conditions of schooling. These areas are slightly lagging in the number of a written and educated population. Those areas are slightly lagging behind cultural and educational developed countries Europe. The following graph shows how situation was in 2012 with children out of primary school. We can conclude that, before floods in 2014, in the Republic of Croatia was better situation because lower number of children was out of primary school, regardless male or female, than in the Republic of Serbia.

Graph 4.: Children out of primary school



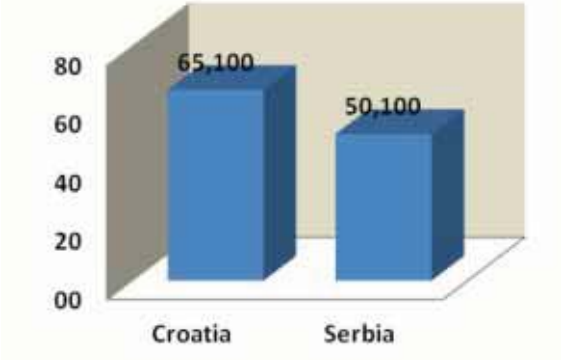
Source:http://data.worldbank.org/indicator/SE.PRM.UNER.FE/countries/RSHRdisplay=graph (01.03.2015.)

Many modern researches of quality of life put emphasis on leisure and social interactions. Immediately after the liberation, also in period before floods in the Socialist Federal Republic of Yugoslavia, especially in the Socialist Republic of Croatia and Socialist Republic of Serbia, cultural, artistic and sport life devoted special attention. Politicians recognized importance of this area and started to develop it with emphasizing that social interaction and sport should serve to working man, his health, physical and moral education and as part of the general welfare. We will describe this topic in Croatia before floods in 2014 with one interesting information which is important for time during and after floods. Involvement in unpaid voluntary work at least once a year is reported by 27%, but the percentage of regular volunteers (who contribute every month) is 8%. Croatia has the small proportion of people (5%) who expressed a wish to spend more time on volunteering and on this way to spend free time. Similarly, in Serbia in this period of economic crises people spend much of time to earn money. On the end they have a little to be with their friends and to take sport activities or something like that.

Security is a crucial aspect of citizens' lives. Being able to plan ahead and overcome any sudden deterioration in their economic and wider environment has an impact on their quality of life. In 1963 in the Socialist Republic of

Croatia and Socialist Republic of Serbia were created major qualitative changes in all elements of the economic security of citizens. The economic security is growing rapidly, primarily due to significantly higher overall production, increase national income, greater employment and labor productivity growth in net wages in social sector. The following graph will show how situation was in 2013 in Croatia and Serbia, before floods, about economic security.

Graph 5.: Inability to face unexpected financial expenses – percentage of total population



Source: http://ec.europa.eu/eurostat/statisticsexplained/index.php/Quality_of_life_indicators_-_measuring_quality_of_life (10.02.2015.)

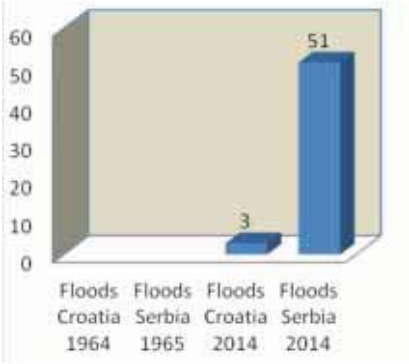
Safety of citizens was on higher level before fifty years than in 2013 in both countries. Number of murders and homicides per country enough testify about that.

1963, year before floods, is very important in terms of governance and basic rights as part of quality of life. In that year was The Constitution of the Socialist Federative Republic of Yugoslavia, also known under the name "Self-Management Charter" because the self-management model was implemented in all spheres and at all levels of social life. The state was renamed the Socialist Federative Republic of Yugoslavia and defined as a "federal state of voluntarily united and equal peoples and socialist democratic union based on the authority of the working people and self-management". The territory of Yugoslavia is integral and is made up of the territories of socialist republics, as Croatia and Serbia. All this completely described how defined people rights and governance was. According to Third European Quality of Life Survey participation can improve one's subjective well-being and help overcome a sense of exclusion. In years before floods in 2014 Croatians overall were active citizens. The proportion of people who contacted a politician or an official, or who attended a meeting or a demonstration was 15%. People with a higher education level express themselves in civic or political action more often than others (European Foundation for the Improvement of Living and Working Conditions, 2012:10). Same situation is also with Serbia. Many people are involved in political life. It is important to mention that in both countries in year period before floods ruled the multi-political party system with defined local government. Basic rights in Croatia and Serbia are generally satisfied. In period before floods in 1964 and 1965 in the Socialist Republic of Croatia and Socialist Republic of Serbia had lasted a period of industrialization. Faster development of the manufacturing industry characterized this period. With this occurred a certain number of factories which were potential pollutants of living and natural environment. According to the Eurostat data in the Republic of Croatia in 2013 6.8% of total population had pollution, grime or other environmental problems and in the Republic of Serbia number was 18.7% (http://ec.europa.eu/eurostat/statistics/explained/index.php/Quality_of_life_measuring_quality_of_life: 10.02.2015.). One reason because percentage was not big is decreasing in producing activities and closing of big industrial producers.

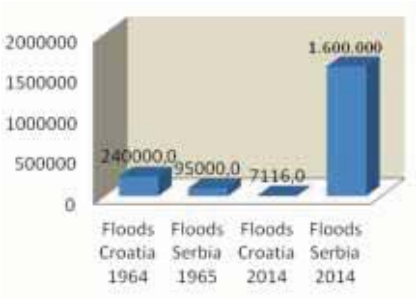
5. HOW FLOODS IN 1964, 1965 AND 2014 IN THE REPUBLIC OF CROATIA AND REPUBLIC OF SERBIA IMPACTED QUALITY OF LIFE OF THEIR CITIZENS

Floods on territory of the Republic of Croatia in 1964 and in 2014, and also on territory of the Republic of Serbia in 1965 and 2014 caused people victims and big damages which is shown comparatively by following graphs.

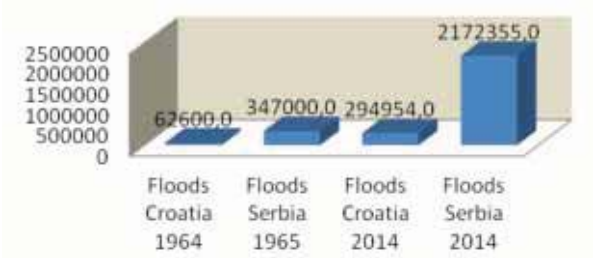
Graph 6.: Total deaths



Graph 7.: Total affected



Graph 8.: Total economic damage – '000 US$



Source:http://www.emdat.be/countryprofile/index.html (04.03.2015)

Now whole dimensions of quality of life will be analyzed after floods in the Republic of Croatia and the Republic of Serbia. Damage from flooding in 1964 in the Socialist Republic of Croatia amounted 8.19% of national income (Kuzmić, 2004). It was huge impact on this dimension of quality of life for citizens, especially for those who were lived in the central town Zagreb which was the most affected. If we compare damage from flooding in 1965 in the Socialist Republic of Serbia, which is described in the graph 8., with GDP of the Socialist Federal Republic of Yugoslavia, which was 58.458 million USD (OECD, 1995) it is clear that floods took 0.6 percent of GDP. A simple calculation shows that due to natural disasters the Republic of Croatia only at the beginning of the year 2014 lost 1.3 percent of its GDP. More precisely, freezing rain is involved with a much smaller percentage of this amount in comparing with floods. Regardless of all, this amount usually spends on the Croatian defense, or to finance their entire police or the judiciary (Marić, 2014). The recent floods in the Republic of Serbia in 2014 will push the Serbian economy into a recession. The incremental impact of the floods on economic growth is estimated at -0.9 % age points, i.e. the Serbian economy will contract by 0.4 % in 2014, rather than growing by 0.5 % as previously projected (European Commission et al, 2014:111).

In terms of next dimension of quality of life, productive or main activity, we can conclude that whole floods described in this paper had strong negative impact. 120 companies were damaged during floods in the Socialist Republic of Croatia in 1964 (Kuzmić, 2004). Large number of people lost their jobs on the longer period of time. Problem which also occurred as consequence of this flooding was that 65% of the equipment and materials of construction operations and industrial construction materials were destroyed. Floods in 1965 in the Socialist Republic of Serbia most affected the Socialist Autonomous Region of Vojvodina. This province in that period the largest production activity based on agriculture. The impact of floods on this dimension of quality of life is reflected that under the water was around 150,000 hectares of fertile Vojvodina's land (Dukić and Gavrilović, 2002). Vukovar-Sirmium County, most affected county during May floods in the Republic of Croatia in 2014, has the most fertile arable land - 150,000 ha of fertile land. The ground, mild continental climate and advantageous annual distribution of precipitation in this region provide quality agricultural production (http://www.vusz.hr/info/osnovni-podaci: 13.03.2015.). Flood in 2014 is directly jeopardized this activity because under the water was 8.500 ha of agricultural land (County headquarters for protection and rescue Vukovar-Sirmium County, 2014).

This dimension of life in the Republic of Serbia directly had been impaired by the flood in 2014 because the number of producing units in the affected municipalities is equivalent to 19% of the total number of industries in the country and, based on field data and on parameters related to the effects of the disaster in the housing sector, it was estimated that a total of 352 units were affected by the floods, equivalent to 3% of the units located in the 24 affected municipalities. Also, the assessment indicates that, among entrepreneurs and employees of small and medium enterprises and large enterprises, 8.708 jobs were lost for a period that is likely to be longer than a year (European Commission et al, 2014:28,120).

Whole floods which are analyzed in this paper had negative impact on health. Beside the damage on most health facilities in Zagreb in 1964, in usable parts of hospitals ended 160 people, many of whom have been chronically ill. Many people came with the symptoms of cramps which, as the doctor of that time, explained, were the result of fear (Barbarić, 2014). Flood in 1965 affected health service in small places in the Socialist Autonomous Region of Vojvodina. On the other hand, central town of Vojvodina, Novi Sad, was protected during whole period of flood defense. But, problem was 214 kilometers of damaged roads and the difficulties for the population with health problems to reach health facilities in Novi Sad. In the Republic of Croatia, exactly in Vukovar-Sirmium County, from a total of 2 buildings and 12 offices of health facilities in the flood destroyed by settlements

- Gunja: 1 building with 7 offices,
- Račinovci: 1 building with 3 offices,
- Strošinci: 1 office,
- Rajevo Selo: 1 office (County headquarters for protection and rescue Vukovar-Sirmium County, 2014).

The May flooding in 2014 in the Republic of Serbia destroyed 74 health facilities, with special emphasis on health centre in town Obrenovac which was totally destroyed and health service in this town for long period was disrupted (European Commission et al, 2014:64).

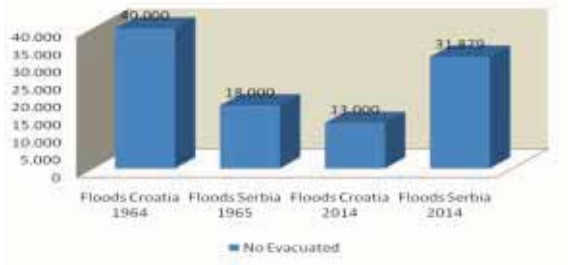
Education, as the fourth dimension of quality of life by Eurostat, was affected by floods in 1964, 1965 and 2014 in the Republic of Croatia and Republic of Serbia. After flood in the Socialist Republic of Croatia in 1964 13.000 pupils and students were remained without their school facilities (Kuzmić, 2004). For flood in 1965 in Socialist Republic of Serbia is characteristic that flood defense took 106 days from May to July which is period when the school year ends on the levels of elementary and secondary schools. So, pupils had not chance normally to finish their tasks and this was main negative impact of flood on education. Due to the May flooding in 2014 in Vukovar-Sirmium County of the Republic of Croatia did not work 10 school buildings. Without teaching, in the areas directly affected by the flood, were excluded 658 children, and from the settlements which were not under water this number were 534 children. Total number of children who stopped attending classes, and continued to attend on another locations, were 1.192 pupils (County headquarters for protection and rescue Vukovar-Sirmium County, 2014). It was found that the floods water during May flooding in the Republic of Serbia in 2014, in school buildings was between 50 cm and 2.5 m high and that it remained in facilities for between 3-30 days. The floods wave severely damaged the 35 educational institution buildings examined which were distributed as follows: 12 preschool institutions; 13 elementary schools and 10 secondary schools located in seven municipalities. In those buildings the educational activities are realized with 45.329 children/students - of which 14% are preschool children, 62% are elementary school students and 25% are secondary school students (European Commission and others, 2014:59).

For floods, before fifty years and in the last year, is characteristic that only positive impact they did on dimension of social interactions in the frame of quality of life, but in short term. Newspapers in the Croatia described that flood in 1964 hard wounded Zagreb, but the people united in their efforts to sustain and assist one another in distress. Same situation was during whole period of flood defense in the Socialist Republic of Serbia in 1965 when people had high social interaction. They recognized that only together could protect themselves and their properties. Also, from floods in those years had started friendships between people who saved lives one to another. Same situation was in the Republic of Croatia and the Republic of Serbia in the last year. Also, good example for this is the Republic of Croatia which during floods in 2014 sent the help in the rescue teams and material technical resources to Bosnia and Herzegovina and the Republic of Serbia with a value exceeding than 1.5 million euro (Državna uprava za zaštitu i spasavanje Republike Hrvatske, 2014). But, in long term floods had negative impact on leisure and social interaction, especially when the danger has passed. For example, in whole

cases sports halls were used for care of vulnerable population. After returning of those people to their homes sport facilities were not in previous state. So, sport as very important part of leisure could not function normally certain period of time. The second good example how flood in the Republic of Croatia in 2014 made negative impact of this dimension of quality of life is the fact that from a total of 14 religious buildings in flood-affected villages were damaged 9 and we know that church is the important place for social interaction of people (County headquarters for protection and rescue Vukovar-Sirmium County, 2014). In the Republic of Serbia in 2014, considering the five sub-categories of cultural assets (built heritage, conservation urban areas and cultural sites, natural heritage, intangible cultural heritage, heritage repositories and museums, cultural centers) the majority of the recorded floods effects (37/53= 70%) concerned cultural assets as follows: 31 for built heritage; 4 for natural heritage; 2 for intangible heritage. The remaining 16 were related to the community infrastructure (6 for heritage repositories; 10 for cultural centers) (European Commission et al, 2014:71).

As shown on the graph below in all floods which we analyzed in this paper, huge number of people was evacuated. Floods made negative impact of their security, as next dimension of quality of life by Eurostat, especially in the town Obrenovac in the Republic of Serbia. People from this town left their homes and did not know whether and when would return to them. It was serious problem in connection with security. They went to temporary camps with tents or in sports halls and immediately had appropriate care of police forces in order to be safe. Also, they left their homes and did not have time and possibilities to take with themselves all belongings from the houses and flats. This was an automatic target of thieves, especially in the first period while the police forces did not determine the possibility of security. There were arrested people who robbed houses on the territory of Obrenovac. Those thefts, as said Director of Serbian's Police, will be treated as serious thefts because it is the exploitation of other people's misfortune (Tanjug, 2014). Of course, whole people who directly were affected from floods in 1964, 1965 and 2014 (lost their homes, jobs, business and similar) were in problem to face with unexpected financial expenses. This is characteristic for people in the Republic of Croatia and the Republic of Serbia after floods in 2014, because how we mentioned in the fourth part of this paper there were a lot people in 2013 who couldn't face with unexpected financial expenses and also because of current economic crises.

Graph 9.: Total evacuated



Source:http://www.emdat.be/countryprofile/index.html (04.03.2015)

Floods also had negative impact on the governance and basic rights as dimension of quality of life. Flood in 1964 in the Socialist Republic of Croatia directly threatened the town Zagreb which was the capital city. In him were positioned government administration buildings, some of which were partially or completely damaged. The positive circumstance during and after flood in 1965 in the Socialist Republic of Serbia was that town Novi Sad, which is the capital city of the Socialist Autonomous Region of Vojvodina with many of governance buildings, was saved from flood. On 19 buildings of public institutions in the Republic of Croatia is determined damage during May flood in 2014, some of which are governance institutions (County headquarters for protection and rescue Vukovar-Sirmium County, 2014). The impact of the floods on the municipal structural capacity to deliver municipal services was determined in the 24 municipalities (16 municipalities, 6 cities; and 2 city municipalities) in the Republic of Serbia in 2014. Public administration buildings incurred the most damage. Furthermore, a large majority of the buildings suffered partial damages rather than total destruction. According to the data received from the 24 municipalities, approximately 230 public buildings stood fully functional before the floods. Of those 230 buildings, a total of 88 buildings were affected by the floods, with 84 partially damaged and four totally destroyed. The four destroyed buildings were located in the municipalities of Obrenovac and Ub (European Commission et al, 2014). Also, the three key aspects which describe differences between men and women in gender patterns and lifestyle, as consequence of this flood, are the information and preferred modes of information

before and during emergencies, opportunities for evacuation purposes during placement of collective centers and difficulties in returning to a residential area, or difficulties in the period of recovery.

It is clear that the floods had a very negative impact on the human environment. Water "sea" in Zagreb, in 1964, and its surroundings were a full 14 kilometers long, and its greatest width was 4 kilometers. Consequences on environment were strong and after floods significant time and resources were needed to back conditions of environment in previous state. Similar situation was in 1965 after flood in the Socialist Republic of Serbia. On the flooded area of the Republic of Croatia appeared close to the 1,000,000 m^3 sludge and about 24,000 m^3 sludge ended up in flooded settlements. This fact directly indicates the negative impact on environment. Five municipalities in the Republic of Serbia in 2014 reported damages to forests, mostly under public ownership. Government soil analysis showed that heavy metal levels were generally below maximum permitted values for agricultural land and, thus, crops can be considered safe. However, some areas are known to have soil that is high in nickel and chromium. There is concern in some areas that leafy crops like lettuce, chard and brassicas may be contaminated. This underlines the need to remove sludge debris. Mine leakage in Krupanj raised fears of antimony contamination downstream: further soil samples have been taken there (European Commission et al, 2014:23).

6. RECOMMENDATIONS FOR IMPROVING THE QUALITY OF LIFE OF CITIZENS THROUGH REDUCING THE RISK OF FLOODS

After the floods in the Republic of Croatia and the Republic of Serbia, which we analyzed in this paper, both countries made big efforts with a lot of resources to back quality of life of their citizens as near as possible to state before floods. Also, a lot of actions did how citizens would be less vulnerable in potential future risk from floods. After the flood in 1964 were started the construction of the flood defense system in Central Sava Basin. Key objects of this system for flood protection Zagreb are two-sided embankments and channel Odra. Floods in 1965, was a great school, so that in the seventies and eighties, in the last century, made a great work on the construction of embankments. The works were of such quality that embankments protected territory during floods in 2014 in the Republic of Serbia (Milošev, 2013). After flood in 2014 and extensive analysis Government of the Republic of Croatia has issued recommendations to work on setting quality protection and rescue system, building channels and very seriously think about the need to equip the system of civil protection. While the Republic of Serbia before flood in 2014 has made progress in terms of establishing an enabling policy and legal environment, after flood it was clear that the institutional capacity to facilitate risk reduction needs to be strengthened. Specific activities to achieve this objective include convening Government across ministries and agencies to reach consensus on level of risk, facilitating partnerships between Government and scientific and research institutions, supporting national and local Governments to effectively undertake its oversight and regulatory mandates and enhancing monitoring and evaluation of public infrastructure projects (European Commission et al, 2014:152).

Reducing the risk of floods may improve the quality of life of citizens. Create various opportunities to increase revenue is an essential part of successful management of flood risks. In high developed countries water management companies should think about new projects in connection with flood protection. In that way they will employ new people, engage other companies with equipment. On the other hand, new people who will be involved in project also will improve their quality of life because of income. Public works programs have their own specific content and can be taken to provide assistance to people that are not in a position to earn money. They will be engaged on public works with main goal to build flood protection systems. Activities relating to health and education can also be directed to reducing risk from floods and simultaneously improving quality of life. Those activities may include devoting a specific part of the materials in schools about problems with floods, with special emphasis on health, and also with a brief training in preparedness and rapid response to flooding. This could contribute to raising awareness about floods within the family and within the community. Activities should be realized in strong connection between national Ministry of health, Ministry of education and national responsible institution for emergency situations. Volunteer activities should be good tool for reducing risk from floods and at the same time for improving social interaction and leisure as dimensions of quality of life by Eurostat. When people, with different ages, attend volunteer activities about flood protection, at the same time they have good opportunity to spend time together and to fulfill their free time. Red Cross and many non-governmental organizations are good examples for this topic. Investing in reducing risk from floods will decrease

potential damage in case of this natural disaster. At the same time, potential vulnerable people in the event that happens flooding will have less cost and also more money „in their pockets". So, they will be more economically secure and better prepared for unexpected financial expenses. In addition to using the mass media, as good way for reducing risk from floods by different emissions about this topic, effective communication can be initiated by influential people, for example, local politicians and officials of municipalities and local communities that respect the population. The last recommendations for improving the quality of life by reducing the risk from floods is very clear, because any kind of activity with goal to reduce flood risk will protect environment where people live.

7. CONCLUSION

The occurrence of floods on the territory of the Republic of Croatia and the Republic of Serbia resulting in loss of lives, damage to properties and destruction of the environment. The quality of life in many municipalities in the Republic of Croatia and the Republic of Serbia is affected by floods. It is very important to mention that all dimensions of quality of life were affected by floods in 1964, 1965 and 2014. Since 1964 when a great part of Zagreb was affected by an extreme flood situation, and then floods in the Socialist Autonomous Region of Vojvodina in 1965, much closer attention is paid to floods and flood protection with aim to protect people, their property and at the same time to improve their quality of life. After fifty years, numerous technical systems which were built after the floods of the sixties were used to protect affected areas in the Republic of Croatia and the Republic of Serbia in 2014. Both countries succeeded mainly to repair damage from floods in the previous years and also to back quality of life to citizens in the affected areas. Comparing the situations before fifty years and now we can conclude that countries which we analyzed in this paper were in many different areas stronger than same now and easier provided quality of life to their citizens as before floods. However, perception of importance of future implementation of flood protection measures should improve territorial and social development of the countries and indirectly the quality of life in the both countries. One of the main problems in flood issue is the financing of anti-flood measures. In view of the fact that financial resources in environmental sphere are limited, preventive anti-flood measures, that can eliminate the impacts of future floods and are not so expensive, assume more importance.

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IMPACT OF FLOODS ON THE QUALITY OF LIFE OF CROATIAN AND SERBIAN CITIZENS: HALF A CENTURY AFTER

Abstract Floods on the territories of Croatia and Serbia are relatively common. Half a century ago, more precisely in 1964, there was massive fl ooding on the territory of the former Socialist Republic of Croatia, when the Sava River spilled and the next year in SR Serbia, when the rivers Danube and Tisa spilled. Last year (2014) there were fl oods in Croatia and Serbia, where several dozen people lost their lives. This paper will try by quantitative analysis to determine the level of the quality of life of the citizens of these two countries in the span of 50 years and the impact of fl oods on the quality of life of the citizens, the level of the damage, loss of lives and other variables that are important for determining the relationship of quality of life and quantity of the resulting damage. The quality of life will be shown by quantitative indicators, such as e.g. GNP per capita.

Key words: floods, quality of life, damage, variable