Open Government Partnership

Open Data on Air Quality: an Engine for Civic Activism

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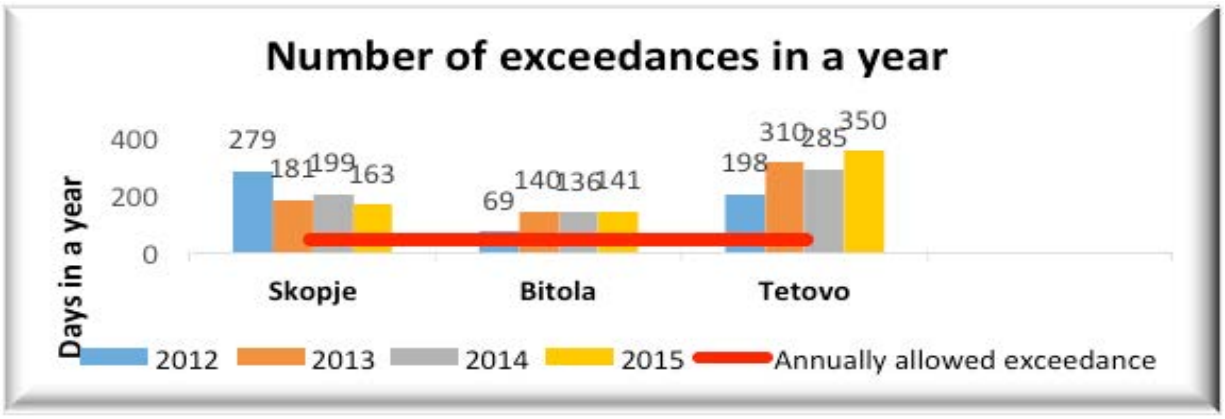
The Costs of Air Pollution

Air pollution is a serious, long-term problem in the Republic of Macedonia. Data from 2015 ranks Tetovo (the fourth-biggest municipality in Macedonia) as the most polluted city in the world according to a broader set of indicators on air, land, and water pollution.[1] Skopje, the capital, and Bitola are also struggling with dangerous levels of particle pollution.

Particulate matter (PM) of 2.5 to 10 micrometers (PM10) pose a particularly serious health concern as they can enter the lungs through the respiratory path and cause lung or heart problems. According to the Macedonian Institute for Public Health, air pollution is the cause of over 1000 deaths in the country annually.[2] Some estimates indicate that particle pollution cost the Macedonian economy €253 million, or 3.2 % of GDP annually.[3]

According to the standards for protection of human life set by the European Union, the daily limit of 50 micrograms/m3 is not to be exceeded more than 35 days in a calendar year.[4] However, as the graph below shows, Tetovo exceeded this standard 350 days in 2015. The air was sufficiently clean for only 15 days of the year.[5] Skopje's and Bitola's results of 163 and 143 exceedance days, respectively, were also dangerous. They surpassed the annual limits four times over.

FIGURE 1: DATA FROM THE AIR QUALITY PORTAL OF THE MINISTRY OF ENVIRONMENT AND PHYSICAL PLANNING[6]



The Ministry of Environment and Physical Planning (MEPP) reports show that air pollution has been exceedingly high in the country since 2005 (for earliest available data, refer to figures 2 and 3). Organized forms of civic activism over the question were absent until 2012, however. Civilian unrest and demands for concrete policy responses – especially in the cities of Skopje, Tetovo, and Bitola – began in 2012. This case study aims to explain exactly what began to draw attention to the issue in 2012, by referring to a survey in the

1 Policy Index 2016 Mid Year. *NUMBEO*. Last accessed July 6, 2016.
2 Аерозагадувањето е алармантно – предупредува Институтот за јавно здравје (Aero pollution hits Alarming Levels – warns the Institute for Public Health). *Репулблика*, from December 9, 2015. Last accessed July 6, 2016.
3 World Bank 2015: http://www.worldbank.org/en/country/macedonia/brief/green-growth-challenges-and-opportunities-air-pollution
4 Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on Ambient Air Quality and Cleaner Air for Europe, OJ L 52, 11.6.2008, p. 1-44. Last accessed: July 6, 2016.
5 Monthly Report, December 2015. *State Automatic Monitoring System for Ambient Air Quality, MEPP. Directive* 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on Ambient Air Quality and Cleaner Air for Europe, OJ L 52, 11.6.2008, p. 1-44. Last accessed 6 July 2016. Last accessed on June 9, 2016.
6 Data from the annual reports 2012-2015 at the Air Quality Portal. *MEPP*. Last accessed on July 9, 2016.

municipalities of Tetovo, Bitola, and Aerodrom in the city of Skopje (including rural areas); interviews with relevant stakeholders from the local and central authorities as well as environmental activists; and media analysis between the years 2012-2015.

FIGURE 2: EXCEEDANCES IN MACEDONIA 2005-2013[7]

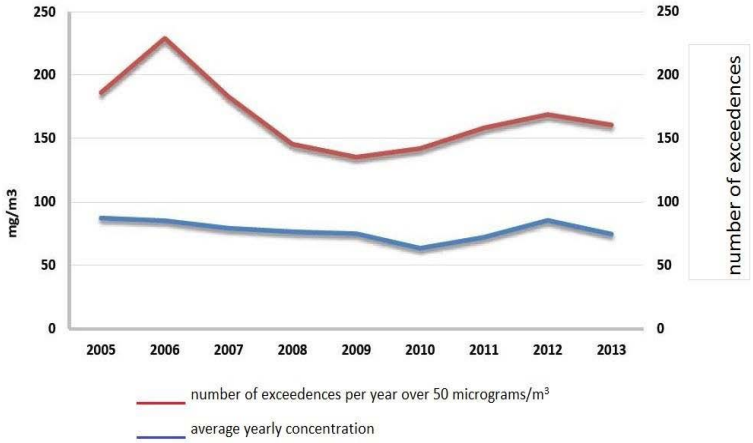
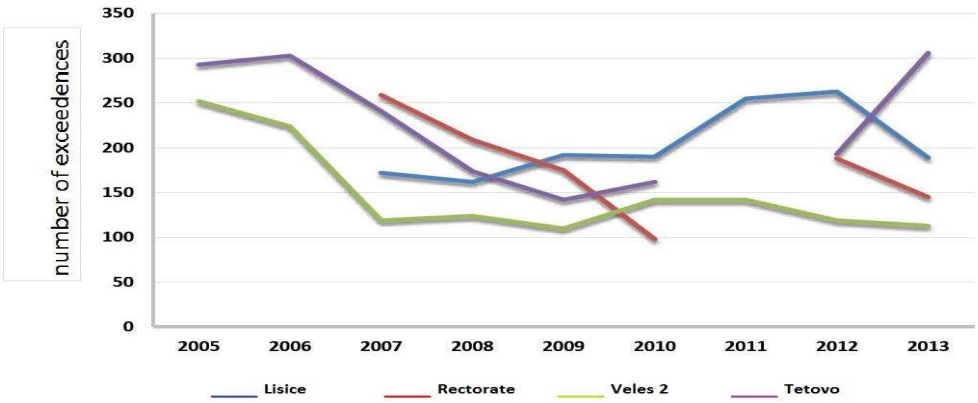


FIGURE 3: EXCEEDANCES BY MONITORING STATIONS 2005-2013[8]



Opening Air Quality Data

The first monitoring stations for ambient air quality were set up in 1998 in Skopje, with the support of the Japanese government. They have gradually multiplied to 17 as more stations were placed in other cities in 2002, 2004 and 2011, enabled by foreign donations.[9] The MEPP started publishing information about ambient air quality on its website in 2004. However, this information was only available in aggregated reports, and awareness about their existence was limited.

Open data was initially introduced in Macedonia through the first National Action Plan (NAP) for Open Government Partnership (OGP) in 2012. The government pledged to open up data in machine-readable format for the first time. Indeed, besides dedicating a separate commitment to open data, the bulk of the justification for Macedonia's first NAP focuses on the benefits of open data.[10] The Ministry of Information Society and Administration (MISA) was assigned responsibility for OGP coordination.

Committing to open data in July 2012, MISA conducted a mapping of citizens' interest in government-collected and -recorded data. Based on this, a list of pilot institutions and data sets were determined.[11] Air-quality data was among the data MISA initially selected, which is how their publication was initiated. Following this commitment, in late 2012 the MEPP began updating the website with hourly information about air quality that is automatically generated from the State Automatic Monitoring System for Ambient Air Quality.

7 Annual Report for Processed Data for Quality of Environment 2013. *Macedonian Information Center for Environment, MEPP*. p. 81. Last accessed on: 9 July 2016.
8 Ibid.
9 Ibid.
10 National Action Plan 2012-2014, OGP Macedonia. *Open Government Partnership*. Last accessed July 6, 2016.
11 Bojadzievska, Irena (former national OGP Coordinator and coordinator of working group for open data 2012-2014). Personal Interview. 6 July 2016.

The OGP Action Plan 2012-2014 introduced the policy that encourages the publishing of open data and established the official portal for open public data. The IRM (Independent Reporting Mechanism) report recognizes the transformative potential of open data for Macedonia.[12] It assesses the open data portal (www.otvorenipodatoci.gov.mk) as complete, and the analyses of the legal framework enabling open data as substantially complete.[13] The analyses of the legal framework culminated in the Law for the Use of Public Sector Data that was adopted in 2014.[14]

The data about ambient air quality is a pilot project of the initiative to open up public data,[15] and despite remaining ICT challenges, it has proven to be a success, and therefore an exception to the general rule, in terms of the impact it has had.

Awareness Spurs Action

Air-quality data, published hourly in an open format as a result of the OGP commitment, gave citizens easily accessible evidence about the levels of pollution in their municipalities and explained the evident bad odor and smog. Data about the alarmingly high levels of pollution empowered citizens to organize and demand measures, especially in the cities of Skopje, Bitola, and Tetovo.

In Aerodrom (Skopje), a group of citizens established a Facebook group, called *Stop the pollution in Aerodrom and Gazi Baba*, which uses the data to provide daily updates on air quality for over 3,000 followers. It facilitates and coordinates public debates on the topic and activities such as making calls, writing letters, and other forms of citizen pressure on local authorities. Since 2012, besides the protests and public debates, this group has organized a petition to the prime minister – who responded by ordering policy measures to be taken by several national and local authorities. Other groups have staged guerrilla actions, sent open letters, and used public advertising and local media to exert pressure.

The first protests were organized in Skopje in December 2012. The data about the concentration of PM10 particles served the organizers for mobilization through social media and were the main reference when addressing the crowd.[16]

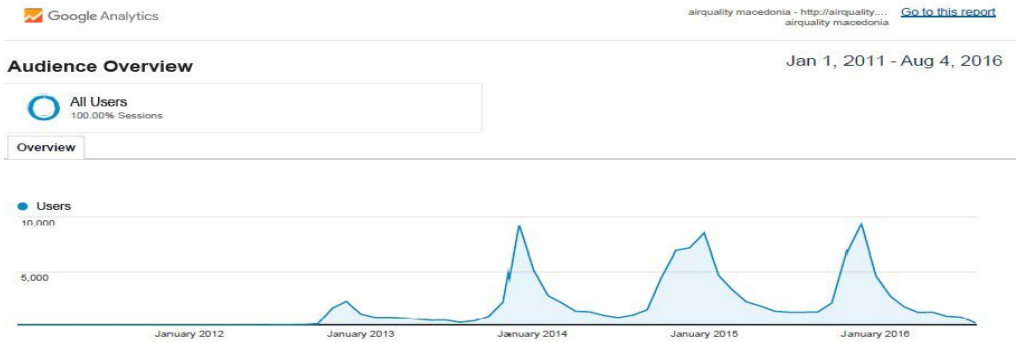
Ordinary people began to mobilize around the issue. Arianit Xhaferi, an ordinary citizen residing in Tetovo, watched the coverage with close attention. Local residents had been complaining about breathing problems and he was sure the air had something to do with it. He visited the source journalists cited often in reporting on Skopje – the air-quality portal on the MEPP website – and realized that pollution levels in Tetovo were higher than anywhere else in the country. He decided that something needed to be done to create awareness and decided to call for action from the authorities, the local population, and the media.

Together with some friends, Arianit called a protest in the city center on December 29, 2013. "There were less than 100 participants in the protest," he says, "and we knew most of them by name." They took on the responsibility of raising public awareness about air pollution in the city of Tetovo as well as demanding accountability from the authorities, and group EcoGuerilla spawned out of these efforts. They started a guerrilla marketing campaign and shared air-quality data through social media. Additionally, they cooperated closely with the local media, which covered the story of air pollution in the city regularly. Because data as numbers did not mean much to the general public, EcoGuerrilla brought together doctors and the media so that the danger of high air pollution, the number of deaths it causes annually, and the types of diseases could become known to the local population. The number of protesters in the upcoming protests grew and, as public pressure grew, so did the activities of the municipality.[17]

Similar public protests followed suit in Bitola in 2014. Participation in protests grew simultaneously with public awareness about the problem and as protests became more organized. The traffic on the web portal also grew from less than 500 users in 2012 to almost 10,000 in January 2016 (see figure 4).

12 National Action Plan 2012-2014, OGP Macedonia. *Open Government Partnership*. Last accessed July 6, 2016.
13 Korunovska, Neda (Reactor – Research in Action). *Independent Reporting Mechanism Macedonia: Progress Report 2012-13*. Open Government Partnership. Last accessed July 6, 2016. p. 40
14 Закон за користење на податоците од јавниот сектор. *Службен весник на РМ, бр. 27 од 05.02.2014 година. (Law on Use of Public Sector Data)*. Last accessed July 9, 2016.
15 Bojadzievska, Irena (former national OGP Coordinator and coordinator of working group for open data 2012-2014). Personal Interview. July 6, 2016.
16 Hristovska Sonja. *(ФОТОГАЛЕРИЈА) СО ГАС-МАСКИ НА ПРОТЕСТЕН МАРШ (Gallery Protesting with Gas Masks)*. From 27 December 2012. Last accessed July 6, 2016.
17 Xhaferi, Arianit. Personal Interview. June 10, 2016. Gruevski, Dushko (Activist from Bitola, *Za nas se raboti*). Personal Interview. June 8, 2016.

FIGURE 4: AIR QUALITY PORTAL TRAFFIC JANUARY 2012 - JANUARY 2016



The problem of air pollution became more real for people as a result of the publication of data about air quality on the MEPP website. Prior to this event, despite the evident bad odor and smog, the issue received little attention from citizens. Intermittently, journalists would show some interest during the winter periods when pollution was more visible and its effects more severe and easily felt by the citizens.[18] Since the winter of 2012, media coverage has increased and expanded constantly (as initially, it focused mostly on the capital city) constantly, with articles about the harmful effect of PM10 and the measures undertaken by the authorities, as data has become easily accessible on the MEPP website. During the peak periods of air pollution, the media report about air-quality data on a daily basis. According to a CRPMs survey, 3.6% of the respondents participated in the protests of 2012. This number grew to 3.9% in 2013 and 5.5% in 2014 to a significantly higher 18% in 2015.[19]

FIGURE 5: NUMBER OF SURVEY RESPONDENTS THAT PARTICIPATED IN PUBLIC PROTESTS

In January 2015, Gorian Jovanovski, an IT student, launched the application Moj Vozduh, or My Air, which obtains data on air pollution directly from the State Automatic Monitoring System for Ambient Air Quality. The application then graphically visualizes the data with a user-friendly interface. The survey shows that Moj Vozduh is more frequently used (26.8%) than the website of the Ministry, which also presents data from the same monitoring system (15.8%). More specifically, 30.4% of the respondents who own a smartphone use the application and 62.9% of its users are under 55. The application is easily accessible from a smartphone and gives users the option to receive push notifications for specified locations, which explains its popularity. The Android version of the application was downloaded 38,341 times by August 2016. The user-friendly interface and the push notifications give users easier access to air-quality data and explains both the popularity of the application and the significant increase in participation in public protests since its launch.

The Moj Vozduh application has helped reach new heights in public awareness on the issue of ambient air quality. Meanwhile, the IT department on MEPP is working on improving their own air quality portal with the help of Finnish experts. This intervention is aimed at improving the visibility and usability of the data and, consequently, its reach too. The new software will be deployed by the end of 2016.[20]

Civic activists claim "open data exposed levels of pollution to them, but also made them more angry and distrustful of the authorities as they did not provide relevant responses to reduce pollution."[21] Since air pollution remains high, many activists are disappointed with the authorities and claim that a lot more should

18 Grozdanovski, Ljupco. Personal Interview. June 22, 2016.
19 CRPM Survey, June 1-10, 2016.
20 Jakimovski, Nikola (IT Staff at the MEPP). Personal Interview. June 7, 2016.
21 Gavrilovski, Filip (activists from Municipality of Aerodrom), Stop the pollution in Aerodrom and Gazi Baba initiative. Personal Interview, June 23, 2016.

be done. Government officials insist that lowering air pollution is a long-term process and, therefore, impact is not immediately evident.[22] On the other hand, municipal authorities also consider "open data as the main factor for increasing citizens' interest in air pollution but see the application that uses the data [Moj Vozduh] as a tool that spreads panic."[23] This is both ironic, given the application was enabled by the official releases of data, and understandable, since public pressure for measures against air pollution intensified in 2015 with the launch of the application Moj Vozduh. Although some positive steps have consequently been undertaken, government and municipal officials generally dislike the application for the pressure it has indirectly brought upon institutions.

Finding Policy Solutions

When activists first started protesting, demanding policy measures from local and central authorities, some people responded saying that the climate is "God's work and should not be mixed with politics."[24] Over the last three years, however, the publication of air-quality data has increased public awareness and also triggered policy response from the national and local authorities.

Despite the legal framework available, the government has not prioritized environmental policies. For instance, Bitola is the only municipality with a Plan for the Improvement of Ambient Air Quality (drafted with the support of the European Union in 2013 as a pilot project) despite the fact that all municipalities are obliged to adopt such plans according to the Law on Ambient Air Quality. Even in Bitola, according to activists, the plan has not been implemented. The municipal councilor for environment in Bitola explains that implementing the plan is complex, as it requires inter-institutional cooperation.[25] Public pressure, fueled by the availability of open data, proved necessary to move pollution higher in the policy-makers' agenda. Through protests and a petition, activists in Bitola managed to get the dysfunctional monitoring station replaced.

In 2015, the MEPP initiated the chemical analysis of air pollutants and Plans for the Improvement of Ambient Air Quality for two more municipalities (city of Skopje and Tetovo).[26] The MEPP is also composing an action plan for efficient communication of information on air pollution to all institutions at the local level in Skopje and Tetovo.[27] Most measures and activities undertaken regarding air pollution derive from the Intersectoral Group for Air Quality established in 2012 by the MEPP. This group, which develops recommendations and measures for air pollution, is composed of various stakeholders from different institutions, including civil society representatives.

Citizens mainly demand short-term solutions during peak pollution periods. Consequently, municipalities and the respective ministry respond with activities that have not been undertaken previously. During the winter of 2015, the MEPP also recommended certain urgent measures to the cities of Skopje and Tetovo due to the fact that the alert threshold (a daily concentration of over 100 micrograms/m3 of PM10 particles for 10 consecutive days) was continuously surpassed. Both municipalities accepted most of the recommendations, such as washing streets with calcium magnesium acetate, limiting traffic, and intensified inspection of industrial emissions.

In Aerodrom, the municipality introduced a second shift for the inspection service, as most of the pollution was detected after working hours. This allowed for closer monitoring of non-industrial business facilities (for example, auto-repair shops that were allegedly burning excess oil) and of activities on the illegal landfills located in a neighboring municipality, Gazi Baba, with whom the Aerodrom inspection service was able to successfully cooperate and coordinate.

In December 2015, due to the extreme daily concentrations of PM10 particles in the municipality of Tetovo, the mayor closed all schools within the administrative territory, on the recommendation of the Ministry.[28] Following a request made by the main, informal group of activists, EcoGuerrilla, the municipality of Tetovo also launched an eco-report portal that allowed citizens to report cases of violation of environmental regulations (e.g. burning of tires, metal waste containers, landfills). Several individuals and businesses were fined for harming the environment.

In Bitola, the informal organization Za Nas se Raboti signed a memorandum of cooperation with the municipality for the chemical analysis of pollutants and for the adoption of responsive measures.[29] Although

22 Izairi, Nurhan (Former Minister of MEPP 2014-2016). Personal Interview. June 10, 2016.
23 Sofija Zafirovska(Head of Environment Sector within the Municipality of Aerodrom).Head of Environment Sector within the Municipality of Aerodrom). Personal Interview July 8, 2016.
24 Xhaferi, Arianit. Personal Interview. June 10, 2016
25 Atanasovski, Ljubo (Councilor for Environment at the Municipality of Bitola). Personal Interview. June 25, 2016.
26 Izairi, Nurhan (Former Minister of MEPP 2014-2016). Personal Interview. June 10, .
27 Grozdanovski, Ljupco (Advisor in the Sector for Monitoring of Ambient Air Quality). Personal Interview. June 22, 2016.
28 Grozdanovski, Ljupco. Personal Interview. June 22, 2016.
29 Gruevski, Dushko (Activist from Bitola, *Za nas se raboti*). Personal Interview. June 8, 2016.

most such measures fell under the competence of the municipalities, some decisions were implemented at the state level as well. In 2014 the MEPP prolonged the deadline for industrial facilities to install equipment (filters) in order to obtain A-integrated work licenses (according to EU environmental standards). Due to public pressure the deadline was not extended in 2015 – resulting in the closure of the steel factory in Skopje known to be the main air pollutant of the city. In 2016 the Ministry of Transport also prohibited import of used cars manufactured before 2005. Only cars with EURO4 ECO or higher standards can be imported into Macedonia today.

Civic activism has brought significant attention to the long-term problem of air pollution in Macedonia and pushed for the implementation of responsive measures by responsible institutions. Although air pollution has not been reduced in Macedonia, awareness about the seriousness of the problem has grown, as have initiatives to do something about it.

Authorities have also undertaken long-term measures that will reduce pollution more effectively but will take longer to be implemented. Tetovo has established a public transportation enterprise that will develop a plan for the city, acquiring and managing cleaner buses.[30] It has also initiated the building of a recycling center to solve the long-term problem of massive wild landfill.[31] All three municipalities, Tetovo, Bitola and Skopje are advancing their plans to join the gas pipeline network, which would provide a substitute energy carrier for households and significantly reduce pollution from the use of wood and electricity, especially for heating during the winter.

Finally, it is worth noting that an important, indirect impact of air-quality data is the unification of civil society toward a common cause in Macedonia – a country divided along ethnic lines where political and ethnic issues gain far greater attention. The Albanian community in Macedonia has often protested against ethnic discrimination and demanded rights for their community but, generally, have been absent from other civic activities in the country as they have never felt fully integrated. However, the Albanian community became very active in the protest against air pollution after the publication of the data for air quality, mainly through the informal organization EcoGuerrilla in Tetovo. Hopefully, this good practice will have a lasting effect on Macedonian society and will shift focus toward many other substantial community matters.

A View to the Long Term

A sustainable long-term plan and solution for the problem of air-pollution is a remaining challenge that requires the dedication of policy-makers. Short-term measures, as a response to citizens' protests, may alleviate the symptoms periodically but they do not go far enough in tackling the causes of the problem, such as energy poverty and limited availability of heating energy sources, vehicles' tier standards and industrial emissions. Indeed, the reduction of air pollution requires a complex policy approach addressing the socioeconomic challenges of a society as well. Citizens cannot be expected to change behavior or upgrade their heating and transportation means if no affordable alternatives are offered, such as public transportation, biking lanes, subventions for solar panels, central gas pipelines, etc.

The publication of the air-quality data has highlighted the urgency of undertaking measures that ensure lower emission of pollutants rather than focusing on measures that address the symptoms of pollution. Although initiatives have been taken, such measures are far from generating effective impact. Nevertheless, the intensification of the debate around sustainable measures has put them into perspective and has explained their correlation in the effort to combat air pollution. In the initial stages of the protests, government officials often accused media and activists for manipulating public opinion with numbers about air pollution when the main cause are the atmospheric conditions during the winter periods. However, with the same data (official data published by the government itself) activists and media have proven that although atmospheric conditions during the winter may aggravate the situation, air pollution is high even in periods with milder atmospheric conditions and, therefore, concrete measures need to be taken.

Air-quality data has empowered Macedonian citizens by providing them with the opportunity to gather raw information that has not been processed by institutions. Consequently, they are able to put pressure on authorities to bring about policy measures and further research. Macedonians are becoming aware of the power of data and the many ways in which they can be used. Hopefully, it will lead citizens to make more demands on public institutions to open up more of their data in coming years.

30 Tetova këtë vit bëhet me transport public (This year Tetovo will gain public transportation). *Telegrafi*. Last accessed on July 9, 2016.
31 Sulejmani, Bashkim. Deponia "Rusino", autoritet lokale premtojnÐ zgjidhje (Rusino Landfill – Local Authorities Promise a Solution). *Alsat-M*. Last accessed on July 9, 2016.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