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FOUNDATIONS FOR THE RESEARCH OF DROUGHT HISTORY IN SERBIA DURING THE 19TH AND EARLY 20TH CENTURY

During the 19th and early 20th centuries, the population of the Principality and Kingdom of Serbia faced numerous natural disasters. Among them, floods were particularly devastating due to their consequences. Large-scale floods caused extensive devastation, almost completely destroying agricultural crops in the affected areas and often resulting in human casualties as well. Notably, the floods of 1864 and 1910 stand out due to their severe impact. In addition to flooding, the population also endured earthquakes, locust infestations, heavy snowfall, and many other hardships that life in the central Balkans entails. Frequent natural disasters in the territory of the Principality and the Kingdom of Serbia also included droughts.

Serbian historiographical research has almost entirely overlooked natural disasters, and only a few studies have been dedicated to them, mainly focusing on floods. As early as the late 1870s, officer Antonije Aleksić wrote about the

floods that had affected the Principality of Serbia during the preceding decade. However, his approach was purely from an engineering perspective, offering suggestions for preventing similar occurrences in the future.[1] Meanwhile, a monograph by Ljiljana Gavrilović is dedicated to the floods that marked the 20th century in Serbia.[2]

Recently, Serbian historiography has produced a few works that contribute to a better understanding of natural disasters in the Principality and Kingdom of Serbia. However, the focus has remained mainly on floods, with only a few exceptions. Žarko Ilić analysed the scale, impact, and consequences of the floods of 1864, placing special emphasis on the reaction of the state authorities. Similarly, Ljubodrag Ristić examined the floods of 1896 and 1897 from the same perspective.[3] Furthermore, Radomir Popović and Aleksandra Vuletić analysed the measures undertaken during the 19th and early 20th centuries to protect Mačva from flooding. Their study includes an introductory section exploring the impact of floods on the population and economy of Mačva during that period.[4]

Based on the information stated above, it is clear that Serbian historiography has yet to focus on environmental history research. Droughts, for example, are among those natural disasters that have received almost no attention so far. An exception is the monograph by Bojana Miljković Katić, dedicated to agriculture in the Principality of Serbia from 1834 to 1867, highlighting the impact of droughts on agricultural yields in several places.[5] Additionally, Marija Kralj's study on the consequences of deforestation in the second half of the 19th century is also valuable.[6] However, these contributions remain insufficient, suggesting that the topic has barely been explored. Consequently, the author of the present contribution had to review the archival and other sources on droughts to determine whether and to what extent primary sources exist for this subject. Once this prerequisite has been met, the present study aims to establish methodological foundations for researching the history of droughts in the Principality and Kingdom of Serbia. It will present the initial findings, archival collections, and published sources that can serve as a starting point for future research on this topic, along with illustrative examples from the available materials.

1 Aleksić, *Morava*, 34–37.
2 Gavrilović, *Poplave*.
3 Ilić, *Poplave u Kneževini Srbiji*, 141–86. Ristić, *Poplave i njihove posledice*, 181–200.
4 Popović, Vuletić, *Regulacija savske i drinske obale*, 135–55.
5 Miljković Katić, *Poljoprivreda Kneževine Srbije*, 113, 121, 146, 192.
6 Kralj, *O posledicama deforestacije*, 43–55.

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Because floods often caused significant damage and thus required a stronger response from the state authorities, they have been better documented. However, this has not been the case with droughts. Unlike floods, droughts developed gradually and had far fewer consequences, as they were not exactly catastrophic. While floods destroyed houses, buildings, livestock, and crops, droughts primarily affected agricultural production. Even then, they did not cause total devastation but merely reduced yields, leaving enough produce to sustain people and animals. One characteristic of droughts is their localised occurrence, affecting specific regions of the Principality and Kingdom of Serbia. This can be attributed to Serbia's climatic zones, which include continental and moderately continental climates. Additionally, an analysis of weather conditions (temperature and precipitation) indicates no prolonged periods of several months without rainfall. Consequently, it is entirely expected that droughts are not among the well-documented natural disasters in archival records related to the state administration in the early 19th century. Moreover, temperature measurements and systematic weather observations in Serbia only began as late as 1848.

Regarding the first reign of Prince Miloš Obrenović (1815–1839), the *Kneževa kancelarija* (Chancellery of the Principality) collection, kept in the *Državni arhiv Srbije* (State Archives of Serbia), represents the primary source for studying all aspects of Serbian history. Only a few reports mentioning droughts and their impact on agricultural production have been discovered in the archival materials related to this period. Among the documented drought years before the early 1840s, 1834 and 1836 stand out. These sources confirm the previously established thesis about the localised nature of droughts in the Principality of Serbia.

The main characteristic of the droughts of 1834 and 1836 was their regional distribution, meaning that prolonged dry periods were limited to specific parts of the country. Between late May and early June 1834, an extended dry spell lasting over two months affected the Timok Military District, i.e., the eastern part of the Principality of Serbia. This drought persisted until the last days of July. The consequences were almost entirely related to agriculture, particularly newly sown crops and meadows essential for livestock fodder. Droughts also affected water mills, as the drop in river levels or their complete drying up rendered them inoperable. Finally, in the final days of July, some areas of the affected administrative unit experienced heavy rainfall, halting the adverse effects of the drought.

Notably, no measures were taken to mitigate the drought's effects, and the available sources do not allow for even a rough estimate of the damage. Since

there were no requests for food assistance from the affected population during the winter months, the drought certainly did not have catastrophic consequences for agricultural production. In line with the prevailing beliefs of the time, which viewed weather conditions as divine punishment, an order was issued during the dry period for all churches and monasteries in eastern Serbia to hold liturgies "so that God may have mercy and grant us rain".[7]

A devastating drought occurred in eastern Serbia during the summer months of 1834, while two years later, in 1836, a six-week rainless period affected western Serbia between April and early May. The latter occurrence was particularly problematic because it struck the Valjevo and Šabac districts during the sowing season, significantly slowing down seed germination. The drought had an even greater impact on plum orchards, which largely failed to bear fruit due to the lack of water. However, drought was not the only hardship faced by the inhabitants of western Serbia. In mid-May, about fifteen days after the beginning of the rainy period, between 6 and7 cm of snowfall occurred even in lowland areas, further devastating the recovering crops and completely destroying the vineyards.[8]

Around the same time, drought also affected southern Serbia, particularly the Kruševac District, though to a lesser extent. A new wave of dry weather followed in mid-July, once again hitting the Valjevo District and lasting for a month. Weather conditions in 1836 were particularly unfavourable for the inhabitants of western Serbia. The dry spell returned in July and early August, impacting the harvest and causing an increase in wheat flour prices. Similar weather conditions occurred in mid-September, bringing yet another, though much shorter, dry period that delayed land preparation for sowing. Apart from the rise in flour prices, there were no significant consequences. The situation did not lead to so-called "famine years", as over 90 % of the population was engaged in agriculture and could independently secure essential food supplies.[9]

In the following decade, there were no severe drought periods, though another wave of dry weather did occur in 1847. The 19th century's fifth decade was characterised by frequent weather disasters leading to the so-called "famine years", most notably 1845 and 1846. One of the worst droughts in the central and western Balkans occurred the following year. The Montenegrin Prince-Bishop Petar II Petrović-Njegoš wrote about it to the Serbian Prince Aleksandar Karadjordjević: "This year, the drought is such that the current generation does not remember anything similar". The situation was no better in Serbia, particularly in the Požarevac District, where the drought manifested in the middle

7 DAS, KK, Crnorečka nahija (XXXVI), 67, 71, 75, 724.
8 Ibidem, Beogradska nahija (IV), 876; Valjevska nahija (IX), 516, 1046; Šabačka nahija (XXXVII), 1346, 1355, 1362, 1482.
9 Ibid., Jovan Obrenović (XIV), 1046.

of May 1847. Once again, state authorities issued orders for prayers to be held in churches and monasteries, and the authorities insisted that officials attend the prayers, encouraging the population to participate more broadly. The following year, the drought was more localised and restricted to the southern border regions. Consequently, corn yields were reduced in the area of Koznik County, in the south of the Principality of Serbia.[10]

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A critical moment for the development of meteorology in Serbia occurred in 1848 when Professor of Lyceum Vladimir Jakšić began measuring air temperature in Belgrade. His diaries represent a crucial data source for studying the climatic conditions of the Principality and Kingdom of Serbia. Jakšić recorded air temperature and precipitation data daily until his death in 1899. In addition to his data collection in Belgrade, Jakšić organised a network of 20 meteorological stations across Serbia in 1856, to which seven more stations were added the following year. However, after Jakšić moved from the Great School to the Ministry of Finance in 1862, he influenced the gradual decline of this meteorological initiative.[11]

However, based on this analysis, it is clear that no severe droughts occurred between 1856 and 1862. The exception was the area of the Čačak District, where a drought significantly affected agricultural production in 1856. In July 1862, the Principality of Serbia experienced a two-week dry period, while in November of the same year, a prolonged dry spell prevailed in the territory between the Drina River and the Miroč and Golubinja regions, i.e., in the western and central parts of Serbia. Meanwhile, in the eastern part of the country, heavy rainfall continued for several days, reflecting the different climate types and diverse impacts that intertwined across Serbia's territory.

After several years of favourable climatic conditions during the summer months, a new drought period began in the spring of 1863, culminating in July 1863. There were only three rainy days during that month and the beginning of the following one, and the total rainfall amounted to merely 10 millilitres of rain or 10 litres per square meter. In addition to Serbia, regions of the Habsburg Monarchy, particularly Banat, were affected by a drought of much greater intensity. Although rainfall was significantly reduced for several months, when almost three to four times less rain fell than in the preceding and following years,

10 DAS, IG, 238. Miljković Katić, *Poljoprivreda Kneževine Srbije*, 113.

11 *Državopis Srbije (1863)*, 189–97. Garić Petrović, *Poljoprivreda Srbije*, 17. Janc, *Razvoj meteorološke službe*, 166. Kralj, *O posledicama deforestacije*, 48.

the drought had no catastrophic consequences for agricultural production, and food shortages were not felt.

The drought and reduced agricultural production did not go without affecting the prices of farm products. As early as May 1863, grain prices began to rise, reaching their peak in August. The leading cause of the price surge in the Principality of Serbia was the impact of the drought in the Habsburg Monarchy, as merchants from this country came to Serbia, bought grain, and resold it in the north. By the fall of 1863, grain prices stabilised, clearly indicating that the consequences of the drought that year did not have a significant lasting effect.[12] Individual documentary reports also noted that in mid-May 1872, a longer dry period was recorded, but the rain arrived in time to save agricultural products.[13]

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The quantity and quality of primary sources for studying the history of droughts in Serbia significantly increased after 1838, with the establishment of the Ministry of Internal Affairs. Specifically, this includes the documents of its Police-Economic Department. The main factor contributing to this development was the appearance of very detailed and frequent reports (biweekly, monthly, semi-annual, and annual) from the local administrative offices about all events in the territory of Serbia – those related to health, political conditions, social relations, crime, but also weather conditions, natural disasters, the state of agriculture, prices, and many other issues. Although documents of a similar nature occasionally arrived at the Chancellery of the Principality during the previous period, reporting became more organised and broader in scope with the formation of the relevant ministries.

In 1852, the Economic Department was separated from the Police-Economic Department as a distinct organisational unit. By the decree of Prince Miloš Obrenović of 1 July 1859, its responsibilities were transferred from the Ministry of Internal Affairs to the Ministry of Finance. A significant administrative change occurred on 29 April 1883, when the Economic Department became part of the newly established Ministry of National Economy. The new ministry devoted special attention to rural issues, leading to the establishment of the Department for Agriculture and Livestock (Z), renamed the Department for Agricultural Production and Veterinary Affairs (P) in 1900. Compared with the previous period, the relevant fonds include specific reports of particular interest to rural

12 *Državopis Srbije (1863)*, 189–97.
13 DAS, IG, 1732.

researchers and historians of environmental history, containing information on crop conditions, annual economic reports, reports on natural disasters (floods, hail), and damage assessments.[14]

The first group of useful sources among those mentioned are the "Reports on economic expertise", which contain monthly data on weather conditions and how they affected agriculture and livestock in specific districts, counties, or municipalities. The reports detail when the weather was clear and warm, when and how much rain fell, whether there were any natural disasters (such as hail, storms, or floods), how long they lasted, and what damage they caused. Additionally, they provide information on crop conditions, ongoing fieldwork, diseases in agriculture and livestock, and food availability. As a rule, at the end of winter or the beginning of spring, these reports often mention the locations of any food shortages for people or livestock, which can indicate the impact of a drought in the previous year in a specific area and its consequences. They also include information on the prices of foodstuffs, whether they were sufficiently available to the population, or if people were buying them. In cases of shortages, there are references to the fact that the population received food from municipal food stocks, which may indicate a shift compared to the first half of the century.

Based on the reports, we can conclude that, as is the case today, droughts most commonly occurred during the summer months. Phrases such as "the weather was dry", "the weather was hot", and "there was little rain this month" appear in the sources. An illustrative example can be seen regarding the year 1880 in the Požarevac District. The reports note that rain fell in the first half of June, while a "strong drought set in" in the second half of the month. In addition to this observation, it was noted that this influenced the progress of the first corn crops, which started growing during that time, and that their development was hindered. Furthermore, regarding another county of the same district, it was stated that "the weather was dry", which, while it helped minor crops, caused considerable damage to the corn, which suffered greatly from the drought. The author of the report informed the superiors that "a few days ago, it rained, so it will significantly improve and may bring a good yield".[15] From this data, we can once again observe the phenomenon of local variation, meaning that significant differences existed between counties, even within the same district, regarding the occurrence of rain and drought.

The second type of source in the same group consists of grouped reports on economic expertise, which were prepared at the level of counties or municipalities for the previous year.

14 Nedeljković, Đuknić, Đurić, Jaćimović, *Vodič Arhiva Srbije I*, 48–51, 125–27, 138–39, 147–51.
15 DAS, MF-E, 1880, Folder 7, row 1.

The third type of documents from the abovementioned archive are the standardised annual reports on the state of agricultural production drawn up at the municipal level. At that time, the municipality was a small administrative unit, typically covering only a few villages. The level of detail was further influenced by the fact that the columns in the reports required item-by-item completion, with the first question asking whether there had been prosperity, how much, and what had prevented more abundant crops. Then, the reports moved on to various agricultural crops, livestock, forests, and labour costs and even included questions about whether the people sold livestock and sought additional work, with the final conclusion stated in the last column: what the year was like, whether there had been hail, drought, floods, and how much damage had resulted from them. For example, most reports from the Smederevo District in 1879 show that the year was dry: there was too much drought (as stated therein); there was no hail, but there was a great drought; the year was not the best.[16] In 1887, a sample from Resava County concluded that some municipalities had experienced drought while others reported that the year had been good. There are differences even in tiny areas, depending on the local weather conditions.[17]

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In the late 19th century, the question of organised temperature measurement and atmospheric phenomena recording was addressed again. A new beginning was made at the initiative and under the leadership of Professor Milan Nedeljković, with the establishment of the Observatory at the Great School in Belgrade in 1887. By the end of the century, a network of 120 stations was created, and the results were published in scientific journals and daily newspapers, providing a valuable source for studying droughts.[18]

The development of periodicals could also significantly contribute to drought research, even locally. In 1869, the Society for Agricultural Economy (later the Serbian Agricultural Society) was founded, which, through its illustrated magazine *Težak*, focused on education about various aspects of agricultural production and life in rural areas. Additionally, it covered orders, product prices, and other current information related to agriculture.[19] The section with the reports on the state of harvest from correspondents in the local communities, usually published at the

16 Ibid.
17 Ibid., MNP-Z, 1888, F. 3.
18 Garić Petrović, *Poljoprivreda Srbije*, 18–19. Janc, *Razvoj meteorološke službe*, 167–77. Kralj, *O posledicama deforestacije*, 48–49.
19 *Težak*, 10 February 1869, 1–2.

end of each magazine issue, was particularly important for the topic of droughts. These reports can provide an overview of the weather conditions, their effects on agriculture, and other activities in the countryside. For example, the reports from the summer of 1894 mentioned that in mid-July, the priest Gerasim from Aleksandrovac reported that there had been no rain for two months, which had caused people "great difficulties". Plum trees were left with yellowed leaves, as "if dead autumn had come", and "not even a sixth of the corn remained". Similar descriptions were reported for other crops. At the beginning of the following month, it was reported that "the heat killed and scorched everything" in the vicinity of Čačak. Similar information about the "severe drought" also came from the broader area of Kragujevac.[20]

The expert analyses, published in *Težak*, served as the basis for Maria Kralj's work on the consequences of deforestation, many of which point to climate change and dry periods. Of course, since the unplanned logging of forests greatly influenced droughts (and floods) in 19th-century Serbia, the insights from the literature on this issue can be used in the study of ecological history. The massive settlement of the territories liberated from Turkish rule and the demand for land led to deforestation, resulting in climate and landscape change, i.e. colder winters with winds and warmer summers.[21]

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At the end of the 19th century in the Kingdom of Serbia, agricultural co-operatives were formed. They were grouped under an umbrella organisation, the Serbian Agricultural Cooperatives Union, established in 1895. Through the Union's assemblies and publishing activities, various aspects of rural life, including droughts, were increasingly brought to the public's attention. For example, the floods of early 1908 and the droughts during the summer months of the same year sparked serious discussions at the Union's Twelfth Assembly, one of which – a lecture by the engineer Milan Jovanović – was published separately. In this publication, Jovanović pointed out ways to prevent droughts and their consequences but noted that very little was being done in this regard. These issues were often forgotten after a few months or the following year when a new harvest arrived. More serious attempts at building embankments, regulating river courses, and utilising water for irrigation only began in the early 20th century. As Jovanović noted, most of these initiatives were proposed by experts but struggled to obtain state support and were mostly left unimplemented.[22]

20 Ibid., 14 August 1894, 285–87.
21 Jovanović, *Poplave i suše*. Kralj, *O posledicama deforestacije*, 43–55.
22 Jovanović, *Poplave i suše*.

Statistical yearbooks (*Državopis* or *Statistički godišnjak*) and their special editions on specific issues (e.g., agriculture, harvest yields, prices, trade of agricultural products, municipal expenditures) represent another source of data on droughts and their consequences. The damages from this natural disaster can be assessed by analysing the harvests and identifying drought periods. Furthermore, the data on prices, trade, and municipal expenditures can facilitate research into droughts and their various aspects. It is important to note that, in addition to library collections, many of these yearbooks are also available in the digital library of the Republic Institute for Statistics of Serbia.[23]

For illustration, the comparative data from 1894, which is known to have been a drought year, can be contrasted with the following year. A quick look at the meteorological conditions, whose statistics were also published in the yearbooks, reveals a significantly lower amount of rainfall and snow across the country during the summer of 1894, especially in July. The station in Kruševac recorded 3 mm and in Niš only 0.2 mm – compared to the following year when the former recorded 26.5 mm and the latter 53.9 mm, which is an enormous difference. This is further confirmed by the nearly double price of corn in April and May of 1895, when the shortage was most strongly felt, compared to the same months during the previous spring.[24]

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Based on the review of the relevant archival materials and published sources, it is possible to confidently state that there is sufficient material for studying the history of droughts during the 19th and early 20th centuries in the Principality and Kingdom of Serbia. Although the documents from the extensive legacy of the Chancellery of the Principality and the personal collection of Ilija Garašanin provide a foundation for optimism, this assertion is particularly relevant to the period after 1838. In the archives of the Ministry of Interior Affairs (until 1859), the Ministry of Finance (until 1883), and the Ministry of National Economy, there are entire bodies of biweekly, monthly, semi-annual and annual reports on economic expertise, correspondence about natural disasters, and damage assessments. The foundation for serious research on the subject in the second half of the 19th century is also provided by the increased presence of the press, the establishment of the Serbian Agricultural Society and agricultural cooperatives, the development of state statistics, and the network of meteorological stations.

23 *Publikacije*.
24 *Statistički godišnjak (1895)*, 206–07, 568–69.

Ecological history researchers will, over time, find additional sources and continue to refine research methodologies. As a first step, it is vital to conclude that the study of droughts in 19th and early-20th-century Serbia, as a largely unexplored historiographical topic, is not only possible but necessary, given their impact on people's lives.

SOURCES AND LITERATURE

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- IG – Ilija Garašanin.
- KK – Kneževa kancelarija.
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  - Crnorečka nahiya (XXXVI).
  - Jovan Obrenović (XIV).
  - Šabačka nahiya (XXXVII).
  - Valjevska nahiya (IX).
- MF – Ministarstvo finansija.
  - E – Ekonomno odeljenje.
- MNP – Ministarstvo narodne privrede.
  - Z – Odeljenje za zemljoradnju i stočarstvo.
  - P – Odeljenje za poljsku poljoprivredu i veterinarstvo.
- MUD – Ministarstvo unutrašnjih dela.
  - P – Policajno-ekonomno odeljenje.
  - E – Ekonomno odeljenje.

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