

Alena Hadrabova<sup>1</sup>, Oleksandra Bilopilka<sup>2</sup>, Petr Sauer<sup>3</sup>

## HISTORY OF HOUSEHOLD WASTE MANAGEMENT: COMPARISON OF UKRAINE AND CZECH REPUBLIC BEFORE 1989

*The paper compares the history of household waste management in two countries: Ukraine and Czech Republic in the period before the 1989 political changes. The analysis has shown that until 1989, household waste management was very similar in both countries. Both in Ukraine and in Czech Republic, it was treated as a source of secondary raw materials and municipalities provided and organised collection centrally, in stationary facilities (collection yards), as well as using mobile equipment. Households were motivated to hand in sorted raw materials both financially and morally. Conventional secondary raw materials (paper, metals, textiles, glass) were sorted first place, other – depending on technical capacities and processing plant requirements. Household waste that was not sorted as secondary raw materials was deposited in landfills in both countries, with a small proportion incinerated for plants. Landfilling and incineration were not environmentally friendly and did not comply with requirements fitting these facilities.*

*Keywords:* environmental protection; household wastes; secondary raw materials; incineration plants.

## Альона Хадрабова, Олександра О. Білопільська, Пётр Шауер ІСТОРІЯ УПРАВЛІННЯ ТВЕРДИМИ ПОБУТОВИМИ ВІДХОДАМИ В УКРАЇНІ І ЧЕСЬКІЙ РЕСПУБЛІЦІ ДО 1989 РОКУ

*У статті проведено порівняння історії розвитку управління твердими побутовими відходами в Україні та Чеській Республіці до 1989 р., у період до початку політичних змін. Аналіз показав, що до 1989 р. управління твердими побутовими відходами було схожим в обох країнах. В Україні, як і в Чеській Республіці, тверді побутові відходи розглядалися як джерело вторинної сировини, муніципалітети забезпечували централізований збір відходів, за допомогою стаціонарних і мобільних пунктів прийому. Мотивуючими для домогосподарств щодо здачі відсортованої сировини була як ціна, так і моральний фактор. Перш за все, були налагоджені системи сортування вторинної сировини – паперу, металу, текстилю, скла, збір та сортування інших відходів залежали від технічних можливостей переробної галузі. Тверді побутові відходи, що не були відсортовані як вторинна сировина, направлялися на звалища для захоронення, за винятком невеликої частки відходів, які спалювалися на сміттєспалювальних заводах. Захоронення і спалювання не відповідали сучасним екологічним вимогам.*

*Ключові слова:* охорона навколишнього середовища; тверді побутові відходи; вторинна сировина; сміттєспалювальні заводи.

*Літ. 29.*

## Альона Хадрабова, Александра А. Белополюская, Пётр Шауер ИСТОРИЯ УПРАВЛЕНИЯ ТВЕРДЫМИ БЫТОВЫМИ ОТХОДАМИ В УКРАИНЕ И ЧЕШСКОЙ РЕСПУБЛИКЕ ДО 1989 ГОДА

*В статье проведено сравнение истории развития управления твердыми бытовыми отходами в Украине и Чешской Республике до 1989 г., в период до начала политических изменений. Анализ показал, что до 1989 г. управление твердыми бытовыми отходами было схожим в обеих странах. В Украине, как и в Чешской Республике, твердые бытовые отходы рассматривались как источник вторичного сырья, муниципалитеты обеспечивали централизованный сбор отходов, с помощью стационарных и мобильных пунктов приема. Мотивирующим фактором для домохозяйств сдать отсортированное сырье была*

<sup>1</sup> University of Economics, Prague, Czech Republic.

<sup>2</sup> Sumy State University, Ukraine.

<sup>3</sup> University of Economics, Prague, Czech Republic.

*цена, а так же моральний фактор. В первую очередь были налажены системы сортировки вторичного сырья – бумага, металл, текстиль, стекло. Сбор и сортировка других отходов зависели от технических возможностей оборудования перерабатывающей отрасли. Бытовые отходы, которые не были отсортированы в качестве вторичного сырья, направлялись на свалки для захоронения, за исключением небольшой доли отходов, которые сжигались на мусоросжигательных заводах. Захоронение и сжигание не соответствовали современным экологическим требованиям.*

*Ключевые слова: охрана окружающей среды; твердые бытовые отходы; вторичное сырье; мусоросжигательные заводы.*

**Introduction.** Ukraine and Czech Republic have had some common and some independent history. Before 1989, Ukraine was one of 15 republics of the Soviet Union, and Czech Republic was one of the two federal republics of the former Czechoslovakia. At that time, environmental policy and its (economic) instruments were discussed and partly coordinated within the Council for Mutual Economic Assistance. The policy in both countries functioned within the framework of a centrally planned system. How different were environmental systems in reality? How did the policies affect these environmental performance in the countries? These and other issues are addressed in these first part of the two papers mapping the history of household waste management in two countries under study. The second paper will provide the historic comparison after 1989<sup>4</sup>.

**Short overview of the history of environmental management in the two countries – literature review.** Although we can learn a lot from history, there is not much literature on the long-term history of environmental policy worldwide. The exceptions are represented by Andrews (1999, 2006), who goes deep into the long-term history of the US environmental management. This book could be used as one comparison as to whether there are some parallels between management modes in the given period of history across the countries with different economic and political systems. Also, Hyas (2000) describes the history of environmental politics since 1945.

The formation of Ukrainian-Soviet history of environmental management could have been affected by the works of Dorst (1968), Galbraith (1969), Ehrenfeld (1973), Commoner (1974), Douglas (1975) and other researchers, whose books had been translated and published in the 1960–1970s. They analysed the reasons for environmental crises in industrialised countries, and offered options to overcome it. The publication of these works was likely caused by the desire to demonstrate crisis-related problems of market economies. However, it led to a growth of public interest in environmental issues too.

In the mid 1970s, in scientific community there was an awareness of the need to solve economic, social and environmental issues, which was only possible by means of environmental management. The tasks of environmental economics were first formulated in Soviet economic literature by Hofmann et al. (1974). Research into the history of environmental economics is described in Khachaturov (1982), Burkinskiy et al. (1999) and others. The history of the environmental management school in Ukraine and theoretical and methodological problems of assessing damages are presented in Balatsky et al. (1984), Melnyk (1988), among many others.

<sup>4</sup> The following (#9) issue of APE (ed. note).

The problem of waste management has been delegated to scientists who study the general theoretical principles and methodological approaches to evaluating the effectiveness of waste management in order to obtain a secondary resource basis for an organisational-economic mechanism of waste management aspects of motivation of economic entities towards the recovery of resources from waste and their further use in the economy. These are Balatsky et al. (1987), Mischenko and Vygovska (2009), among many others.

As for Czech Republic, there are some works describing the issue in the context of the development of Czech/Czechoslovak economy (Hadrabova, 2002, 2004, 2009a). The whole long-term history is described in Hadrabova (1999, 1995) and Sauer (2002). There is also a body of literature in which authors describe their understanding of Czech/Czechoslovak situation in environmental management when studying the historical background of the topic investigated. They do so mostly when formulating suggestions for practical policies and trying to contribute to the theory of transformation. See VanDeever and Carmin (2006), Andrews (1993), Andrews et al. (1994), Carmin and Jehlicka (2005, 2010), Moldan and Hak (2011), among many others. Issues concerning the history of waste management in Czech Republic are analysed in Hadrabova (2009b).

As for household wastes management, it has historically been a considerable problem, and still is today. It has had considerable impacts on the environment and major economic connections worldwide.

Involvement of countries in international associations has gained ever growing importance recently. This results in the need to respect rules and requirements of such coalitions. Before countries enter blocs, it is beneficial to conduct comparative analyses that assist in their easier integration. Synoptic comparisons are also beneficial before detailed analyses. This paper aims to become such a framework comparison.

**Household waste management in Ukraine before 1989.** In Ukraine until the early 1980s, the problem of household waste received attention only in the context of resource saving on the one hand and cleaning cities on the other. Collection and disposal of household waste was the responsibility of municipal services; waste was removed from cities and deposited in unregulated dumps or incinerated in local fireplaces. Starting from the 1920s, in order to save resources, waste paper and scrap metal were collected actively. The union-wide association for the procurement and processing of secondary raw materials and industrial waste, known as "Soyuzutil", was established under the Ministry of Light Industry in 1932. After the World War II, in 1945 the Council of People's Commissars issued the Government Regulation no. 1595/1945 on measures to increase procurement and supply of secondary raw materials and industrial waste, in order to save cellulose, cotton and other valuable raw materials. In 1948, "Soyuzutil" was reorganised into the Department named "Glavvtorresurs". Management of waste collection and treatment was carried out at the state level, departments controlled regional procurement organisations and processing enterprises. In the centrally managed economy of the USSR, the costs of collection and processing wastes were transferred to the costs of production of particular industries.

In the Ukrainian SSR, secondary wastes collection was done on the voluntary basis. The press continually mentioned that one tonne of recycled paper yielded 0.7 tonnes of paper or cardboard. Collection and processing of waste paper was called

an important state matter. Most of waste paper was collected by Pioneer organisations of schoolchildren and an active portion of conscious citizens. Annual quotas for waste paper collection were established for each school class. Campaigns to collect waste paper and scrap metal were usually held twice a year by each school. The collected waste paper was then sent to central collection stations.

In the 1970–1980s, collection and treatment of waste was carried out at the union-wide level by the departments of secondary raw materials specifically established under the State Supply Committee and the State Planning Committee of the USSR (Zalkind et al., 1985). The creation of new industries to address institutional, scientific, economic, managerial, technical, information-analytical and other issues began in the Ukrainian SSR with the Resolution no. 411/1970 Coll., on measures to strengthen the material-technical base of organisations and enterprises on collecting, processing and recycling secondary raw materials.

The system of the State Supply Committee included accounting of the use of recycled materials. Detailed and formalised statistical reporting – both overall and for different categories of wastes – was conducted for information support to public administration. Rigid accounting of precious metals used in the industry was arranged during this period, in particular in electronics.

Bottles for milk, beer, vodka, wine and soft drinks were designed and unified. At that time, the practice of exchanging secondary raw materials for money was widely used. For example, one could buy a bottle of milk in exchange for two empty milk bottles. High prices encouraged people bring glass containers to collection points. Although prices for waste paper remained very low, the practice of collecting waste paper and scrap metal by pupils remained unchanged until the early 1990s. Sanitary regulations for collection of secondary raw materials by schoolchildren were adopted in 1981. The practice of exchanging waste paper for scarce goods, especially books, was introduced in 1974 in order to promote collection of waste paper by citizens. For 20 kg of waste paper, the collection point issued a voucher that could be exchanged for books that were not commercially available. Some things could be bought only after handing in a certain quantity of rags, for example, audio cassettes, Rubik's Cubes (Zalkind et al., 1985).

Collection of secondary raw materials was carried out by specifically created organisations in cities and workers of consumer cooperatives in villagers. Secondary raw materials were also collected through the network of collection stations. In addition, mobile collection points were created that allowed collecting 2–3 times more secondary raw materials than stationary facilities.

The use of secondary raw materials led to savings of significant amounts of materials, and produced large economic effects in different types of production, technical purposes and consumer goods. The average levels of collection at the end of 1978 were about 59% for waste paper, 51% for textile waste and 31% for used tires. But these indicators concerned only urban population (Zakharov et al., 1980).

Successful collection of secondary raw materials can be explained by the existence of in-shop collection points, which encouraged population turn in glass containers, paper, textiles and more. Prices for secondary raw materials were set centrally, and were identical in all the collection points; they were also a motivation for population.

The levels of collection and recycling of the most important types of secondary raw materials were planned and regulated by the state and sectoral schemes on secondary resources. Special production infrastructure for collection and industrial processing of the main types of secondary raw materials was created throughout the territory of the Ukrainian SSR. The levels of collection achieved were largely determined by the presence of consumer-recycled materials.

Scientific organisations responsible for the use of waste in industry were created across all industries, their activities were planned and controlled, and the State Supplies Committee held control over the use of secondary resources. As a result, in the period from 1975 to 1985, a large number of production, collection and processing plants were built and put into operation for the production of various industrial products and consumer goods from secondary raw materials or with partial use of them.

A methodology to determine the resource value of various kinds of secondary raw materials, a methodology for assessing the effectiveness of the wastes use, and standards for collecting and storing various kinds of secondary raw materials were developed and implemented. There were attempts to determine analytically and approve legislative standards on adding recycled materials in the manufacture of various industrial products.

In 1986, a general provision was developed according to which "each organisation responsible for the development of new materials and products, at the same time, had to develop a technology for the reuse or recycling after the expiration of service life or operation", providing for the establishment of appropriate facilities simultaneously with the creation of facilities for the production of materials or products.

Incineration plants made in Czechoslovakia were installed in 4 cities of the Ukrainian SSR after 1972. All of these so-called first-generation incinerators were practically without air treatment devices and did not produce any heat or electricity. Dioxin contamination, representing the greatest danger associated with burning wastes, was not controlled and there were no relevant laws for that, nor even necessary measuring by laboratories.

In the 1980s, the amount of waste was increasing, and scientists turned their attention to landfills, which at that time occupied large areas of the country, but were not landfills in contemporary technical terms. Rules for landfills construction were developed, which included the characteristics of the territory selected for a landfill.

In 1991, the State Supplies Committee ceased to exist – the market entered into the economy with its own laws, and the Committee was reorganised into various ministries (for details about the period after 1989, see the paper in the next issue of APE).

**Household waste management in Czech Republic before 1989.** Czech Republic had a very long history of handling household waste already at the beginning of the period under study. Historically, waste management had always been understood as a municipal matter and responsibility, and was handled accordingly, although the methods were not appropriate according to today's standards. Most household waste was either incinerated in local household fireplaces or deposited in unsecured and unregulated dumps without respect for possible environmental consequences. The war economy (1939–1945) brought about a new feature: the requirement to sort and submit for reprocessing certain waste types as secondary raw materials. This trend was

consolidated and extended after 1948. The requirements of the post-war restoration and production development led to an effort to recover those portions of waste that could be reused. The method chosen matched the conditions of a planned, centrally controlled economy with the predominant state role and cooperative ownership. The national enterprise "Sberne suroviny" (Scrap Yards) was established in 1951 for collection and repurchase of defined secondary raw materials.

Government Regulation no. 88/1949 Coll. on collection and sale of secondary raw materials was an important legal standard instituting the collection of secondary raw materials. It enumerated 18 types of wastes as secondary raw materials (e.g., metals, paper, rags, broken glass etc.), specifying that these secondary raw materials must not be destroyed and had to be offered and handed over to specified enterprises. The Regulation gave local authorities a significant role of taking care of regular collection of the defined raw materials, their appropriate storage and sorting, and sale to a specified reprocessing enterprise. Citizens handed them over to the collection points free of charge, with predominantly moral motivation. However, there were no inspections or sanctions. Municipalities financed the whole system and the revenues from these sales were income for municipal budgets. The regulations were partly modified in successive years, but the principles remained unchanged.

The legal redefining of 1964 brought more substantial changes. Namely, the Decree no. 30/1964 Coll., on secondary raw materials and industrial textile waste management altered the positions of citizens and local authorities. In the previous period, local authorities provided and financed the system of collection of defined raw materials in municipalities, and the revenues were their income. The new legal definition transferred local collection yards under the national enterprise "Sberne suroviny", and citizens now could offer their waste (raw materials for repurchase) directly for payment according to a set price list. In addition, it included used television screens among secondary raw materials.

The functioning of this system of collection and repurchase of wastes regarded as secondary raw materials was relatively successful and it made it possible to reuse at least some parts of household waste generated instead of depositing it in the environment. Information on how much municipal waste was produced each year (period), how much of that was household waste and how much of it was sorted out in this way, is very incomplete and different sources show very different figures. Regular and credible reporting and statistical surveying was not made with the exception of two surveys in the 1980s with little credibility.

There was no legal definition for the remaining household waste types. Both households and municipalities had to handle it outside the legal system. The situation was very different for single-family houses and countryside on the one hand and apartments in towns and cities on the other. Rural households and those in single-family houses had the chance to get rid of parts of their waste by composting, feeding to domestic animals, or incinerating in local fireplaces. Mixed municipal waste only contained ashes from stoves and all that could not be sold off to "Sberne suroviny". New types of waste occurred over time, the quantities of plastics growing in particular. The remaining mixed waste also contained some secondary raw materials that their originators had not handed in to "Sberne suroviny". Small municipalities at that time typically did not provide their citizens with dustbins or any other receptacles for

mixed waste. Dumps thus appeared spontaneously in the majority of municipalities and waste was taken there. The sites were not set up ignoring potential environmental risks, they were not managed or operated, and municipalities eventually decided to shut them down at best and reclaimed them partly. With the traditional countryside life changing over time as a consequence of the overall lifestyle and living standards change, the quantities of mixed household waste grew and its structure changed. Collection containers slowly made their way even to smaller places, and local authorities began to organise their emptying. In towns and cities, especially those with the predominance of apartment housing, the tradition of mixed waste bins and emptying them by means of municipal utilities had been much longer. A problem that gained gravity was the disposal of larger objects, which often ended up on the streets or their owners threw them out in the wild.

Municipalities that provided collecting bins and their emptying were the operators of the so-called controlled landfills, where waste was transported at municipal expenses. They were not landfills in the modern-day sense of the word (approved, built and operated with respect to environmental requirements and regulations). They were not even legal landfills in the true sense of the word, as the legal system had no definition of landfills at that time. However, they were one step better than the municipal dumps described above. They provided at least some minimal security against negative effects for the surroundings, some operators and supervisors. The adopted term for them is "managed landfills".

The preparation of the first ever bill on waste began in the 1970s. Efforts to improve environmental protection were activated strongly abroad as well as domestically. However, this bill was never finalised and was eventually put on hold.

Preparation of the second bill on waste started in this period, in the late 1980s. The reason was the ever worsening situation with wastes and secondary raw materials. The factual core of the bill was based on the analysis of the existing handling of secondary raw materials. The fundamental principle was to be the "originator principle": the entity in whose activity the waste was generated is responsible for it. The law was to deal with waste generated in citizens' households only starting at the point of its collection or repurchase by waste collecting organisations. The law did not deal with any responsibilities for citizens on how to handle their household waste; it only stipulated that there would be some kind of obligation for citizens to hand over their household waste for collection or repurchase. The effort to push this bill through ended with the fundamental change of social circumstances in November 1989, because the bill conformed to the conditions of a centrally planned economy and could not be applied under the new socioeconomic system.

**Discussion and conclusions.** It follows from the above that both Ukraine and Czech Republic before 1989 regarded household waste primarily as a source of potential secondary raw materials and that its management was subordinated to that. This history is even longer in Ukraine than in CR, dating back to the pre-war period. The reason is that, unlike CR, the Soviet Union already had a centrally planned economy before the WWII. In the study period (and after 1945 in particular), both countries promoted collection and processing of household waste as secondary raw materials. Over time, the composition of these secondary raw materials changed in these countries depending on the level of knowledge, evolving technical capacities and needs of

the national economies, from the basic paper and scrap metal to other materials (textiles, glass etc.), but not yet plastics in this period. The collection organisation was similar in these two countries too. Central directive bodies generated regulations and carried out the overall supervision of their practical implementation. The actual collection was concentrated at the local level and was the responsibility of municipalities. In both Ukraine and CR, local authorities (municipalities) established stationary collection points, organised mobile collection and made use of social organisations or certain existing organisational structures for promotion of these activities. Both countries used the price of secondary raw materials handed in as a tool for increasing household motivation. Beginning in the 1970s, Ukraine put a great emphasis on scientific research activity and development of processing capacities for secondary raw materials sorted out from household waste. This issue was not emphasised in CR, but no significant difficulties in processing and reusing the secondary raw materials occurred. The methods of their processing were known and some use was typically found for the waste collected. As for the remaining waste that was not sorted and reused as a secondary raw material, it ended up in landfills in both countries. Neither Ukraine, nor CR established and operated its landfills according to the standards common nowadays. Household waste incineration was not widespread in either of the countries. Czech Republic essentially had only one such incineration plant in Prague, built in the pre-war period, and building additional ones only began to be considered in the 1980s. A lot of unrecycled household waste was combusted in household furnaces, particularly in the countryside. Ukraine built waste incinerators in 4 cities, but these first-generation facilities were not equipped with adequate air emission treatment and were not utilised as heating sources: they only incinerated waste. The solution was highly problematic, but the era did not permit any better.

**Acknowledgement.** *The paper has been developed with the support of the IGA project no. 21/2014 "Analyza systemu nakladani s textilnim odpadem v domacnostech v Ceske republice" and with the institutional support from the Faculty of International Relations, University of Economics, Prague.*

#### **References:**

- Балацкий О.Ф., Мельник Л.Г., Яковлев А.Ф.* Экономика и качество окружающей природной среды. – Ленинград: Гидрометеоздат, 1984. – 190 с.
- Безотходное производство: экономика, технология, управление / О.Ф. Балацкий, Б.В. Ермоленко, А.Ю. Жулавский, В.А. Зайцев, Н.В. Ярош. – М.: ВИНТИ, 1987. – 184 с.
- Буркинский Б.В., Степанов В.Н., Харичков С.К.* Природопользование: основы экономико-экологической теории. – Одеса: ИПРЭИ ИЭП НАН Украины, 1999. – 350 с.
- Гофман К., Лемешев М., Реймерс Н.* Экономика природопользования (задачи новой науки) // Наука и жизнь. – 1974. – №6. – С. 12–17.
- Гэлбрейт Дж.К.* Новое индустриальное общество. – М.: Прогресс, 1969. – 480 с.
- Дорст Ж.* До того как умрет природа. – М.: Прогресс, 1968. – 223 с.
- Дуглас У.О.* Трехсотлетняя война: Хроника экологического бедствия. – М.: Прогресс, 1975. – 239 с.
- Залкинд Л.С., Царев И.В., Щербаков В.Г.* Закупка вторичного сырья предприятиями системы ГОСНАБА СССР. – М.: Профиздат, 1985. – 70 с.
- Захаров А.М.* Прогрессивные методы сбора вторичного сырья от населения. Центральный научно-исследовательский институт информации и технико-экономических исследований по материально-техническому снабжению. – М., 1980. – 26 с.
- Коммонер Б.* Замыкающийся круг. Природа, человек, технология. – Ленинград: Гидрометеоздат, 1974. – 280 с.



- Мельник Л.Г. Экономические проблемы воспроизводства природной среды. – Харьков: Выща школа, 1988. – 159 с.
- Мищенко В.С., Виговська Г.П. Організаційно-економічний механізм поводження з відходами в Україні та шляхи його вдосконалення. – К.: Наукова думка, 2009. – 295 с.
- Хачатуров Т.С. Экономика природопользования. – М.: Экономика, 1982. – 256 с.
- Эренфельд Д.У. Природа и люди. – М.: Мир, 1973. – 256 с.
- Andrews, R.N.L. (1993). Environmental Policy in the Czech and Slovak Republic. Chapter 2. In: Vari A., Tamas, P. (eds.). Environment and Democratic Transition: Policy and Politics in Central and Eastern Europe, Boston: Kluwer Academic Publishers.
- Andrews, R.N.L. (1999; second edition 2006). Managing the Environment, Managing Ourselves: A History of American Environmental Policy. New Haven, CT: Yale University Press.
- Andrews, R.N.L. (2006). Managing the Environment, Managing Ourselves: A History of American Environmental Policy. Second edition. New Haven, CT: Yale University Press.
- Andrews, R.N.L., Paroha, L., Vozab, J., and Sauer, P. (1994). Decentralized Environmental Management in the Formerly Communist States: A Case Study of Decin, Czech Republic. Environmental Impact Assessment Review, 14(2): 111–136.
- Carmin, J., Jehlicka, P. (2005). By the Masses or for the Masses? The Transformation of Voluntary Action in the Czech Union for Nature Protection, Voluntas: International Journal of Voluntary and Nonprofit Organizations, Vol. 16, No. 4.
- Carmin, J., Jehlicka, P. (2010). Navigating Institutional Pressure in State-Socialist and Democratic Regimes. Nonprofit and Voluntary Sector Quarterly, 39(1): 29–50.
- Hadrabova, A. (1995). Development of the System of Environmental Protection Management in Czechoslovakia in 1945–1989 (in Czech). Acta Oeconomica Pragensia, 4(3): 29–37.
- Hadrabova, A. (1999). The Most Important Instruments of Environmental Protection in Czechoslovakia in 1945–1989 (in Czech). Acta Oeconomica Pragensia, 6(5): 147–176.
- Hadrabova, A. (2002). Ecological Aspects of Transformation, part I: History of Environmental Policy (in Czech). In: Spevacek, V. (ed.). Transformation of the Czech Economy (in Czech). Praha: Linde nakladatelstvi s.r.o.
- Hadrabova, A. (2004). Environment and Environmental Management (in Czech). In: Prucha, V. (ed.). Economic and Social History of Czechoslovakia in 1918–1992 (in Czech) (pp. 198–210). Brno: Doplněk.
- Hadrabova, A. (2009a). Ecological Aspects of Economic Development in 1969–1989 (in Czech). In: Prucha, V. (ed.). Economic and Social History of Czechoslovakia in 1918–1992 (in Czech). Vol. 2, period: 1945–1992 (pp. 873–896). Brno: Doplněk.
- Hadrabova, A. (2009b). Historical Development of the System of Charges for Municipal Waste in the Czech Republic (in Czech). In: Slavik, J. (ed.). Charges Systems in Municipalities – Risks and Opportunities for Waste Management (in Czech) (pp. 31–48). IREAS.
- Hyas, S.P. (2000). A History of Environmental Politics Since 1945. Pittsburgh: University of Pittsburgh Press.
- Sauer, P. (2002). Czech national state and its environmental policy: An excursion into history and present. Tokyo 30.11.2002–01.12.2002. In: Nation States and Economic Policy: Conflict and Cooperation [CD-ROM]. Tokyo: Japan Economic Policy Association.
- VanDeever, S.D., Carmin, J. (2006). Sustainability and EU Accession: Capacity Development and Environmental Reform in Central and Eastern Europe. In: G.B. Cohen and Z. Bochniarz (eds.). Environment and Sustainable Development in the New Central Europe. Oxford: Berghahn Books.

Стаття надійшла до редакції 26.03.2015.