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# THE ENVIRONMENTAL IMPACT OF EXTENSIVE GROWTH IN WESTERN– AND EAST-CENTRAL EUROPE BETWEEN 1850 AND 1960

**Abstract**

In this paper, I investigate how industrialization and urbanization changed Western— and East-Central Europe between the mid-nineteenth and mid-twentieth. I aim to analyze the relationship between economic development and their environmental consequences in Great Britain, Germany, and Hungary. I aim to point out the connection between extensive economic development and environmental pollution, and to show the uniformity of industrial and urban changes and their environmental consequences, whether they unfolded in Western–, or in East-Central Europe.

**Keywords:** economic development, extensive growth, environmental pollution, urbanization, environmental problems, Germany, Great Britain, Hungary.

## 1. The Environmental Impact of the Industrial Revolution in Britain

Prior to the complex set of changes we label today as the "Industrial Revolution", much of the population was engaged in rural agricultural work. After a long build up process new agricultural techniques appeared in North Western Europe, most particularly in the North Low Countries and Britain. This enabled a growing number of people to work in non-agricultural industries by the 19th century. According to Jan de Vries evidence suggest that a build up process for accelerated changes have began centuries earlier. The fruits of these changes ripened in front of the eyes of contemporary observers at the end of the eighteenth century. After the hegemony of the Mediterranean (Venice, the Spanish and the

Portuguese), the stress of economic development relocated to the North Low Countries and later to Britain.

There has been a rich scientific discussion whether the notion of the Industrial Revolution was justified or not. Whether one accepts the concepts of Marx, Lewis, Rostow or Schumpeter, there is little doubt about the change in our civilization since then. New technologies spread in manufacturing and transportation by the extensive use of fossil energy sources, and these technological changes interacted with social and environmental tendencies.

England was often regarded as the most well-prepared land in mid-eighteenth century Europe to adapt industrial structural changes. Coal and iron ore were widely available in Britain; hence, steam power could be utilized. There was a fairly reliable infrastructure and stable government, which created the background for business and stressed the pivotal role of private initiative.[1]

Industrialization and urbanization rapidly transformed Great Britain. By the mid- nineteenth century there were nine British cities that had more than 100,000 inhabitants. For example, Manchester grew from a small-scale town to a merchant metropolis in about 70 years by 1830. Urbanization and industrialization triggered coal use, and Britain's domestic coal consumption grew from 10 million tons of coal in 1800 to 189 million tons by 1914. Industry was an important user of coal, and source of smoke pollution. In large cities such as London, Manchester, and Sheffield a great number of homes were heated with coal during the winter months which worsened all-year around pollution from industrial chimneys.[2]

Business interests and pollution control did not fit well together, and only after decades of industrialization and pollution was that legislators began to pass the first effective pollution control laws in Britain. This was because in general businesses were focusing on profitability and output, whereas their activities endangered the environmental and public health condition of the local communities. For example, when a parliamentary investigation began about the control of industrial smoke pollution of the Dowlais Ironworks in Merthyr Tydfil in South Wales, Sir John Guest, the proprietor, explained to the parliamentary inquiry that for certain production processes, such as rolling rails, full power steam capacity was needed, which led to more intensive smoke from factory chimneys. The reduction of steam power would have reduced the production capacity of the plant.

Even though the efficiency of steam engines improved, their numbers were growing faster, hence they produced more pollution. For example, in the previously mentioned Dowlais Ironworks, the number of steam engines grew from 23 to 63 between 1837 and 1856.[3]

Water pollution had already been well known in Britain before the nineteenth century. In London, and in other populous areas, domestic sewage and commerce had negative impact on river flows. In the long run, safe and adequate drinking water supplies of large urban centers were not in particular danger, because most cities' water sources were upstream, in environments safe from pollution by the late nineteenth century. Fish, however, were less lucky and by the acceleration of industrial pollution, salmon and other species of fish began to deplete, for example in the river Thames, Severn, Avon and Trent. The growing problem of fish stock loss was acknowledged by the 1824 and 1836 parliamentary committees. The investigations of such committees, however, were only focused on the prohibition of mass fishing techniques, and did not consider the regulation of water pollution sources.[4]

British economic growth in the first half of the nineteenth century received a new impetus from infrastructure construction. After two brief and bustling periods of railway construction between 1835 and 1837, and again between 1845 and 1847, the core of the present-day railway network of the United Kingdom was constructed. Coal, iron, steel, and railways also meant new markets, and the emergence of new industries to supply these markets**.** Steel production, for example, was revolutionized by the Bessemer converter, which was a new and enhanced method of steel production. Simultaneously, new technologies revolutionized the chemical industry and gave birth to new industries, such as electro-engineering. Those who could not keep up with the increasing speed of technological change in the nineteenth century soon had to close down their operations. For example, the Cyfarthfa Iron Works in Merthyr Tydfil, was one of the first large iron works in Britain, established in 1765. When the eccentric owner, Robert Thompson Crawshay refused to convert the factory from iron to steel production, the factory's sales were in decline, and the plant eventually was closed down in 1874.[5]

Smoke remained one of the main environmental concerns in late nineteenth century Britain. Not only industrial pollution, but in the case of large cities domestic coal consumption prevailed. In this matter, the Sanitary Act of 1866 marked a significant milestone, because local authorities were required to prosecute owners of "smokey" factories.

Limits of regulations and measurement were rather primitive, utilizing the "Paris Smoke Scale", which judged the appearance of the chimney top from very thick to "faint" smoke. Civil society, concerned about pollution, was also on the rise in Britain. By 1910, the Coal Smoke Abatement Society began monitoring programs and encouraged other citizens to be active members of their observation groups.

Water protection legislation also improved in late nineteenth century Britain. In 1876, the Rivers Prevention Pollution Act required the neutralization of sewage before it was discharged to watercourses. Such standards, however, proved to be impossible to meet, and sanitary authorities normally gave exemptions to polluters.[6]

Despite its inevitable environmental problems, late nineteenth century Britain, was probably a safer, more livable, and more pleasant place than ever before for much of the British society. Initial features of the industrial mode of production, such as extremely long working hours, child labor, the shortened life span of the working class, high child mortality, and horrifying living conditions disappeared gradually, at least in part.[7]

By World War I, British wastewater controlling methods grew more sophisticated. This country was loosing importance in economic terms, but still exported about 30 per cent of the world's industrial products in 1914. However, Germany closed the gap during previous decades and exported nearly as much as Britain: 27 per cent.[8]

Britain's steady loss of economic importance paralleled the general shrinking of Europe's share in the world market. Between 1913 and 1926, the North American share of the world economy rose from 14 to 19 percent. Asia's share grew even faster, from 12 to 19 percent and, Europe shrank from 58.5 to 48 percent.[9]

Water quality protection changed in the latter part of the nineteenth century in the United Kingdom. At that time, organic content of river flows generally determined the degree of pollution for authorities. By the beginning of the twentieth century, a growing number of engineers argued that relying solely on organic compounds was insufficient and the absorption of dissolved oxygen should be included in water quality monitoring. To make water quality monitoring more reliable, the November 1912 report of the Royal Commission supported the inclusion of oxygen absorption into the water quality monitoring process. It was, however, not until the interwar era when the professionalization of wastewater issues reached a higher level of complexity on a local level. For example, in response to the central government's aim to control pollution with greater

efficiency, the Nothinghamshire County Council's Public Health and Housing Committee set up a Rivers Pollution Prevention Subcommittee in July 1923. This subcommittee was responsible for any pollution of watercourses county-wide, and received its first full time "Rivers Pollution Officer" in May 1927.[10]

In the United Kingdom in the latter part of the nineteenth century, sanitary engineers "emphasized, the most important, in any case, was the state of the river, once the discharge had been mixed with its water". The British system inspired other dilution and dilution-based wastewater discharge fines, and dilution-based calculating methods became the basis for Hungarian wastewater discharge fines between 1962 and 1968.[11]

## 2. Late Coming Industrialization and it Environmental Impact in Germany

Germany was in the first wave of industrialization, but due to the late adaptation of industrial changes, the Germans were "late comers" to the Industrial Revolution. This position contained several positive elements. For example German industrialists adopted modern production technologies faster than already established producers in Britain and Belgium.

German industrial development were based on the typical branches of industry of late nineteenth century Europe: coal, iron, and steel. Between the 1830s and 1870s, German industries grew at an enormous rate. During this period, Krupp shot out from a manufacturing firm of 60 men to an industrial giant of 16,000 employees. In the 1860s, the rising star of the German chemical industry appeared in the horizon. Future leading companies, Hoechst, Bayer and BASF were born in this period.[12]

Besides the heavy industries, apparel and food production, such as the manufacturing of shoes, clothes, hats, meat, beer, and sugar produced success stories. Another similarity to the British and Belgian way of industrialization was in Germany, that one of the facilitators of the German industrial "revolution" was the construction of an extensive rail network. The opening of the first line in 1833 was followed by the rapid expansion. The rail network in the German lands reached 6,500 km in 1852. Growth continued in unified Germany and the rail network reached 50,000 km in 1873, and 61,000 kilometers by 1910.[13]

Prussia facilitated the growing rail network with direct and indirect state investments. A large number of industrial plants and mines in unified Germany were state controlled. Even a supposedly private institutions, such as the German chambers of commerce were heavily affected and partly controlled by the state.[14]

Parallel with industrialization, rapid urbanization unfolded in formerly agricultural and rural Germany. During the second half of the nineteenth century Berlin's population grew from 412,000 to 2 million inhabitants. Hamburg's population was close to 1 million by the First World War.[15]

Industrialization and urbanization combined in one of its most extreme form in the Ruhr, in the vicinity of Europe's largest bituminous coal and lignite fields. Even if local iron deposits were inadequate for large-scale iron and steel production, the Rhine, Western Europe's foremost transportation route served as a channel of imported iron and of export for Ruhr products. Large Western European markets were situated within easy reach of this industrial area. In addition to the privileged geographic preconditions of the *Ruhrgebiet*, the Bismarck government supported the coal-based heavy industry with growing military orders.[16]

Even though coal made the Ruhr area one of the largest concentrations of heavy industries in the world, the switch from charcoal to coal and from small-scale to large-scale iron and later steel manufacturing took quite a while for the Germans. As late as 1825, the total annual production of Rhineland and Westphalia was 17,000 tons, produced in charcoal-fueled furnaces. Less than 20 years later, in 1844, nearly two-thirds of the total 51,800 tons of annual regional iron production came from coal-fueled production plants. Production growth accelerated from 1850 and several large coke-fueled plants opened in the 1850s, utilizing by the *fettkhole* of Westphalia.[17]

**Table 1. Coal production in the Ruhr region, 1774-1996 (Tons/Year)**

| | |
|---|---|
| 1774 | 70,000 |
| 1826 | 455,000 |
| 1871 | 13 million |
| 1913 | 115 million |
| 1938 | 130 million |
| 1950 | 120 million |
| 1996 | 56 million |

**Source:** Cioc, *The Rhine*, 83.

In the first half of the nineteenth century, new impetus for industrialization in East-Central Europe came from the West. From 1800 to the eve of World War I, Europe's population skyrocketed. The population in Great Britain almost quadrupled from 10.9 million to 40.8 million. Belgium, Holland, Germany and Austria-Hungary's population doubled. The populous West needed more imports, especially foodstuffs. Workshops and factories were set up to supply the growing volume of Western and domestic demand. A steady stream of foreign investment found its way to the region, and during the second half of the nineteenth century, production and pollution scale of new East-Central European plants were considerably larger than before.[18]

Other costly but profiting investments such as railroads, mines, and banks were also set up by foreign money. In the Czech lands the engine of economic and industrial development were mostly of German origin. Also, the Czech nobility was more eager to set up enterprises than its Hungarian counterpart. For example, in 1829 the Archbishop of Olomouc established Rudolfshütte,[19] the predecessor of the giant Vitkovice steel mills in Ostrava. In 1843, these works were overtaken by the Rothschilds who modernized the plant. In 1873, the *hütte* and mines merged into the largest steel production plant in Austria-Hungary and operated until World War I under the name of Witkowitzer Bergbau und Eisenhüttengesellschaft (Vitkovice Mine and Ironkworks Company).

By 1900 in the Czech lands the rate of the industrial workforce in the total population grew rapidly and was similar to Germany's. (35.5% in 1882 and 42.8% in 1907). Companies in Bohemia and Moravia dominated the empire's heavy industrial capacities: 60 percent of its metal and 75 percent of its chemical output was produced there. The localities of Most, Duchov and Teplice grew to be the centers of production in the brown coal region of the north. Ústí nad Labem was the center for the chemical industry. Machine building was represented by successful companies such as the Ringhoffer in Smíchov, Prague; the Škoda Works in Plzeň; the Daněk in Karlín, and further works in České Budějovice and Kladno. Fusion made large companies even bigger. For example, the Ruston Company merged with the Bromovský Schulz & Son Company, which concern later acquired the Ringhoffer Company and soon became part of the large Škoda.[20]

## 3. The Interwar Era and Environmental Conditions

During the interwar period, extensive development in Europe stopped. Defeated countries such as German and Hungary struggled in the early 1920s and then were hit hard by the depression years. It was the rearmament programs which triggered industry again in the late 1930s, but eventually led to a devastating war. After the war, defeated Gemany suffered under war reparations and the discharge of pollutants decreased for a brief period. In the weak and slowly stabilizing Weimar Republic, industrial production began to rise steadily after 1924 and it surpassed pre-war levels by 1928. Waste waters from the German industrial plants affected the Dutch section of that river severly.[21]

In 1917, a water quality investigation of the river Elk near Rotterdam by the Government Institute for Hydrographic Fisheries Research (Rijksinstituut voor Hydrografisch Visserijonderzoek) found severe organic pollution, "fungi" in deeper layers of the Rhine. Such organic pollution was assumed originate from the numerous German paper and pulp factories, which discharged their wastewaters to the Rhine. Organic pollution from cellulose plants was periodic. Fungi accumulated in the vicinity of German cellulose plants, and in periods of high water, normally in the Spring, fungi was swept downstream from Germany. "Flushing" fungi down the river Rhine was followed by accumulation periods, in which fungi-type organic pollution did not appear in the Rhine with such severity, until it was swept downstream again by high water.[22]

It was not only German industry that threatened the quality of the Rhine, however. The gigantic industrial conglomerate in the French-controlled Ruhr area was the major polluter of the river. In 1931, French authorities granted concessions for potash mines to dump waste salts to the Rhine. In the 1920s and '30s potash was an important ingredient for chemicals, medicines, soaps, matches, glass, paper, aniline dye, bleaching agents, explosives, and fertilizers. In the late 1920s, potash mining was an important business in Germany and France, and about 95 per cent of the world's production originated from there. The French deposits accumulated in the area around Mulhouse in the Upper Rhine Valley. Potash was discovered around Mulhouse in 1904 and developed into a major business, accounting for around 30 percent of all international sales. Unlike the German potash fields which were extensive in geographical location, the Mulhouse potash mining area was concentrated and compact. This is why dumping salts was so concentrated.[23]

The Dutch feared that if dumping started, it would decrease the already low water quality in the Middle and Lower segments of the Rhine. Dumping potash, and hence increasing the waste levels of the Rhine, was considered a threatening international issue in Holland. The Dutch attempted to resolve the issue diplomatically, but eventually the French dismissed Dutch claims as "overreactions" to potash dumping. Obviously, the French might have seen it differently if the Netherlands was upstream and France downstream.[24]

The Great Depression hit Germany particularly hard. Economic struggles and social issues aided Hitler to gain power with a populist, Nazi agenda in 1933. Once in power, the Nazis began to work to fulfill their election promises, which included the rapid elimination of unemployment. Initially, employment was fueled by the first and second Reinhardt Programs, which facilitated infrastructure construction, especially autobahn (freeway) building. Later, war related industrial production became the key element of Hitler's economic vision of Germany.[25]

After World War I, the overall structure of the Czechoslovak industry remained unchanged. Czechoslovakia's large industrial potential and prestigious producers such as Škoda made it the leading industrial country in East-Central Europe. Czechoslovak iron and steel manufacturers remained concentrated in Ostrava and Kladno, where about 90 percent of the total Czechoslovak steel output was produced in 1936.

Polish heavy industries also remained very much concentrated in one area, Upper Silesia. Here, most production plants were state-owned, and similarly to Czechoslovakia, a handful of works produced a major share of the output. In 1936, the state-owned Wspólnota Interesów Górniczo-Hutniczych S.A. and the Huta Pokój merged, and combined they produced about 75 percent of the steel output of Poland. [26] When the Allies began air raids in German industrial centers, large defense production capacities were built up in the East instead of in jeopardized Germany. Hence, the industrial workforce in Poland nearly doubled from 808,000 to 1.5 million between 1938 and 1945. On the approach of the Soviet army, the Wehrmacht began to transport or damage industrial plants in occupied territories. What remained was soon dismantled and transported to the U.S.S.R. by the Red Army.[27] Dismantling, aerial raids, and surface fights eventually devastated Polish industry.[28]

Contrary to Czechoslovakia and Poland, which mostly benefited from the period following World War I, Hungary was one of the losers in the post-World War I changes.[29] Normalization of social and economic

conditions was slow compared to Czechoslovakia and Poland.[30] After the First World War, large infrastructural investments lagged behind regional levels, and began only after Hungary was able to access considerable foreign loans after 1925. Such loans financed water supply and wastewater system improvements for example in Miskolc in 1927, when a second 400 mm water main was constructed from Tapolca to the city, and in 1937, when a water tunnel was constructed under the Avas hill. During the interwar period, the water supply network grew considerably in Miskolc, from 39.4 km to 59.8 km, and supplied a growing number of neighborhoods.[31]

## 4. Post-World War II Recovery and Environmental Destruction

A second long period of extensive industrial and urban development followed World War II in Europe between 1950 and 1973. This was the period when heavy industrial production reached its climax in Western Europe and various large-scale heavy industries and urban development projects began to dominate East-Central European countries. As a result, water pollution skyrocketed both in Western and East-Central Europe during the 1950s and 1960s.

In 1945, it was clear that the economics and international politics of the interwar years could not be continued. Europe was dominated by right-wing, authoritarian regimes between the two-world wars, communism and socialism became popular ideas throughout Europe after World War II. The Left did not only attract the masses, but also enticed intellectuals. And the communists formed popular parties not only in the Soviet Union dominated East-Central Europe but throughout the entire continent. In Italy, for example, over two million people joined the Communist Party, which was one of the most radical communist parties in the West.[32] Also the socialist idea was very popular in France and in the United Kingdom, which eventually led to a series of nationalizations in both countries. The Christian Democratic movement, which, also saw a large growth after 1945, and the socialists agreed with the rise in state intervention, believing it was necessary to achieve prosperity and economic growth. It was of foremost importance for all major political powers in Europe to avoid the catastrophic spiral of populism and rearmament that lead to the inferno of World War II.

These ideals and a focus on larger state intervention in national economies resulted the nationalization of key economic sectors throughout Western Europe. Renault, the auto manufacturer, along with several banks, was nationalized in France in 1945. A year later private coal mines and the main electricity and gas providers, Electricite de France and Gaz de France were nationalized. In the United Kingdom after the nationalization of the coal industry in 1946, electricity providers, rails, water transport and some local gas suppliers were nationalized. In 1951 the state acquired the national iron and steel industry, which later was denationalized by the following conservative government.[33]

Heavy industry was the flagship industry at this time in Europe. The growth of heavy industries was typical in Western Europe between the two world wars, and continued briefly after 1945. Heavy industry's share of gross national product was 32 per cent before the First World War in Great Britain and it grew to 49,5 per cent in 1938. Similar tendencies were typical in Germany, Sweden, the Netherlands, Norway and Italy. [34]

While the socialist idea was popular in Western Europe after the war, an extreme form of communism, Stalinism was implemented in East-Central Europe, as a result of the political and military supremacy of the Soviet Union in the eastern part of the continent. Communism, however, was not rejected by the entire population in East-Central European countries. Local communist parties enjoyed relative, yet minor popularity hence the military presence and political pressure of the Soviet Union was essential to seize power.

But even without the massive political weight of the USSR after the World War II the communist ideology was enticing somwhat. This was because, in theory, communism was believed to create more favorable preconditions for economies, and would provide better production results than capitalism. It would eliminate the anarchy of the market and fluctuations in supply and demand. Workers would be freed from exploitation and would work more enthusiastically. Communism was believed by many of its followers to be a purer and nobler system than capitalism. According to them, communism would ensure social justice and equality. These ideals were vital in a war torn continent where the brutal memories of one of the worst economic crises in the world and the horrors of World War II lived long. [35]

In reality communism arrived brutally to East-Central Europe. After the war, Moscow-backed communists seized power in most East-Central European countries. In Poland, the script of establishing a dictatorial

regime was similar to Hungary and the German Democratic Republic. The Moscow-backed Polish Workers' Party (Polska Partia Robortnicza, PPR) eliminated political opponents gradually. Geopolitical factors also facilitated central planning in postwar Poland. After 1945, borders were restructured, and the country's territory shrunk by 20 percent, and "shifted" to the West. Her new 110,000-square-kilometer Western territory was rich in coal and iron deposits, and had advanced infrastructure that fitted well for Stalinist-type industrialization.

In Czechoslovakia, the communist party operated legally between the two world wars. Therefore, in 1945, the KSČ (Komunistická strana Československa) had a strong basis of support. The party was established already in 1921, and within four years it acquired 350,000 members, with 41 parliamentary deputies and 13.3 percent of the votes in state election.[36] During the war, both Czechs and Slovaks had important communist underground movements, which identified themselves with national liberation. After the war, the Czechoslovak Communist Party produced the fastest growth in the region among communists and had more than 1,000,000 party members by 1947. Without much support from Moscow, the Czechoslovak communists gained 38 percent of votes at the country's first postwar election in March 1946. The communist candidate, Klement Gottwald, was named Prime Minister (1946-48). Gottwald slowly changed his initial tactic of political cooperation and coalition government, and by February 1948, communists forced all non-communist ministers to resign.[37]

In Hungary, Allied air raids destroyed significant production capacities all around the country. During the war, hundreds of thousands of Hungarian soldiers and civilians died, and over half a million Jewish Hungarians were deported and murdered by the Hungarian police and German occupational forces.[38] In November 1945, the Smallholders' Party won the election with 57 percent of the vote, while the communists and the social democrats received 17 percent of votes.[39] Between 1945 and 1948, Hungarian Muscovites eliminated their rivals aggressively by slicing them up one by one.[40] The final cut of the salami was in 1947-48 when several important political figures, including Prime Minister Ferenc Nagy, were charged with conspiracy. During the plot, Nagy was on holiday in Switzerland and decided not to return to face charges.[41]

Western and East-Central European countries developed controversial political systems after World War II, however the economic foundation of both the capitalist and communist modes of production were the same: growth. Because of both the capitalist and communist system was clinging on economic growth, and without growth they stagnate and decline environmental destruction has been inseparable from both capitalism and communism.

The period between 1950 and 1973 was characterized by on the one hand by a long period of uninterrupted economic growth, on the other hand unprecedented environmental pollution that tainted every larger areas on both sides of the Iron Curtain.

According to Barry Eichengreen western European state interventionist industrialization, and East-Central European centrally planned economic systems showed a number of similarities in their strengths and weaknesses. Eventually they were both excelling in economic catch-up, at least initially. Bridging the large gap between Western Europe and the USA in the postwar era was aided by the cooperation of trade unions, employers' associations, and growth-minded governments. These groups of decision makers conjointly mobilized savings to secure investment and full employment. Full employment was especially crucial in Western Germany in the late 1940s and in the 1950s, where the memories of mass unemployment and hyperinflation were well remembered.

**Table 2. Growth of real gross domestic product per capita, 1820-2000 (Average annual compound growth rate)**

| | 1820-1870 | 1870-1913 | 1913-1950 | 1950-1973 | 1973-2000 |
|---|---|---|---|---|---|
| Austria | 0,7 | 0,5 | 0,2 | 4,9 | 2,2 |
| Belgium | 1,4 | 1 | 0,7 | 3,5 | 2 |
| Finland | 0,8 | 1,4 | 1,9 | 4,3 | 2,2 |
| France | 0,8 | 1,5 | 1,1 | 4 | 1,7 |
| Germany | 1,1 | 1,6 | 0,3 | 5 | 1,6 |
| Italy | 0,6 | 1,3 | 0,8 | 5 | 2,1 |
| Netherlands | 1,1 | 0,9 | 1,1 | 3,4 | 1,9 |
| United Kingdom | 1,2 | 1 | 0,8 | 2,5 | 1,9 |
| Greece | NA | NA | 0,5 | 6,2 | 1,7 |
| Ireland | 1,2 | 1 | 0,7 | 3,1 | 4,3 |
| Portugal | NA | 0,5 | 1,2 | 5,7 | 2,5 |
| Spain | 0,5 | 1,2 | 0,2 | 5,8 | 2,6 |
| Bulgaria | NA | NA | 0,3 | 5,2 | 0,7 |
| Czechoslovakia | 0,6 | 1,4 | 1,4 | 3,1 | 1 |
| Hungary | NA | 1,2 | 0,5 | 3,6 | 0,9 |
| Poland | NA | NA | NA | 3,4 | 0,3 |
| Romania | NA | NA | NA | 4,8 | 0,6 |
| USSR | 0,6 | 0,9 | 1,8 | 3,4 | 0,7 |
| Yugoslavia | NA | NA | 1 | 4,4 | 1,6 |

**Source:** Based on Angus Maddison, The world economy: a millenial perspective (Paris: OECD, 2001). and Eichengreen, The European Economy since 1945.

Postwar reconstruction was followed by a period of extensive growth in both the Western and East-Central parts of the continent that worsened environmental conditions in the West and introduced industrial and urban environmental pollution on an unprecedented scale in countries of East-Central Europe. Here, especially in rural areas, such levels of pollution had been unknown until the introduction of communist central plans.

During the 1950s and to a lesser extend in the 1960s, the major goals of industrial development in Western and East-Central Europe were similar. During the same period of time, the management of environmental

resources resembled each other in both the Western and East-Central parts of the European continent.

## 5. Extensive Growth and the Economic Policy Debate in Hungary in the 1950s

During the brief Stalinist period in East-Central Europe from 1949-56, industrial capacity focused on iron and steel manufacturing, and to some extent on chemical production. The core aim of Stalinist industrial policy was identical to post-war Western European: to produce more. After Stalin's death, the need for political reform swept through East-Central Europe.

Stalinism in Hungary produced a social and economic crisis as early as 1951-52. In 1953, Hungarian Stalinist leader Mátyás Rákosi, was summoned to Moscow and forced to resign. His successor, the reform-minded communist Imre Nagy exercised small economic policy corrections and relaxed the Stalinist terror.

State investment budget was decreased from 16.8 to 11.8 billion Forints between 1953 and 1954. The industrial budget of the First Five Year Plan (FFYP) was slightly decreased from 47 to 41.5 per cent, therefore the share of heavy industry in the FFYP was somewhat lowered, from 43 to 36.5 per cent. Hence, more was invested in agriculture, its share rose from 13 to 24 per cent, and housing which rose from 6 to 11 per cent. Although, pressure on industrialization was eased somewhat, the overall structure of industry did not change radically.

After 1953, economic reform discourse emerged in the pages of the *Economic Review* (*Közgazdasági Szemle*), a professional journal for theoretic economics. A large proportion of economists in Hungary agreed that Stalinist planning had to be altered.[42] György Péter, head of the National Statistical Office, pointed out in the *Economic Review* that rigidly planned production goals were the reason behind issues such as low-quality products. György Péter argued that companies should be interested, not only in the qualitative fulfillment of main indicators in the plan, but companies should have a "financial interest" in the production process. Péter's radical reform ideas proposed that socialist companies should actually operate in an environment with real prices and in quasi market conditions. Péter believed that a reform economic environment would facilitate "economical management" and "profitability", which he

saw as key components for economic success under state-socialism. Less radical visions of economic reforms, for example an "Imre Nagy-backed special committee report", was assessed by the end of November 1954. This document was less critical, but also called for "prices to reflect true costs". The young János Kornai's ideas on economic reform were very formative during the reform process of the late 1950s and 1960s. Kornai defended his doctoral dissertation just before the revolution in September 1956. Therefore, scientific debate on his work was postponed by the outbreak of armed resistance. Discussions were halted during the 1956 Revolution, but after hostilities stopped, economic debate was renewed.

After November 1956, the leadership of János Kádár and his new Hungarian Socialist Workers' Party (Magyar Szocialista Munkáspárt, MSZMP) sought legitimization and consolidation following a period of terror. Kádár understood the need for economic reforms, but dismissed radical approaches to secure wide support for his course. As a result, the Hungarian planned economy did not strategically change in 1957. In theory, Stalinism was proclaimed to be a thing of the past. Economic incentives in the early Kádár-era focused on "economical planning", "thriftiness", and the production of "profitable products" which required limited energy and raw material input. New economic plans aimed to enhance productivity and to reduce production costs.

Kádár and his new communist party supported István Friss' study, that was conducted for the Department of Economic Policy of the Hungarian Socialist Workers' Party. Friss called for moderate reforms and "minor corrections of the mechanism".

Friss' study was based on data collected in thirty industrial companies in the spring of 1957.

Kádár's Second Three-Year Plan (1958-60) criticized "the pursuit of quantitative development (which) became predominant (in earlier years). Meanwhile, thriftiness, quality improvement, production cost reduction and international cooperation were pushed into the background".[43] Theoretically, the new economic policy under Kádár acknowledged that Hungary was poor in raw materials and energy resources. The Second Three-Year Plan emphasized the development of competitive, export-oriented, and profitable industries. In line with modernization goals, the regime started a diesel engine program, but that proved to be a fiasco. Communication engineering projects were run at the Csepel Iron and Metalworks (Csepel Vas- és Fémművek) with very limited success. In reality, the Second Three-Year Plan and ambitiously envisioned new

technologies did not challenge the dominating position of the iron and steel industry in the 1950s. The development of large, heavy industrial capacities remained pivotal in Hungary in the 1960s and to some extent in the 1970s.

Partial modernization efforts of heavy industry provided some successes. In the iron and steel industry, priority was given to investments which aimed to increase production efficiency.[44] For example, a modernized coke manufacturing plant was added to the Danube Ironworks (Dunai Vasmű, 1956-) in Dunaújváros in 1961.[45] In the Ózd Metallurgical Factory's furnaces were modernized. The construction of a nationwide natural gas supply grid provided more environmentally-friendly fuel for industrial energy generation and opened the door to more energy-efficient technologies in heavy industry.

The natural gas project was a success and was ahead of its time by Western European standards. By the end of the 1960s, a large number of industrial plants in Hungary shifted from the use of coal to natural gas. The introduction of natural gas-based energy generation reduced production costs and significantly enhanced energy efficiency. When heavy industrial plants shifted their source of energy from coal to natural gas, phenols, some of the most dangerous metalworking industrial pollutants, disappeared from industrial wastewater.

As a result of accelerated development plans in East-Central Europe, the waste water situation became critical by 1958: only 22 percent of the population had access to local sewage systems. Regional variations were huge. For example, 53 percent of the total 3373 km long national wastewater grid were built in Budapest, the capital. Fifty-six percent of the nation's user connected to waste water systems lived in Budapest. The capacity of the Budapest waste water pipes were also disproportionate, they carried 83 percent of discharged wastewater nationally![46] Further regional variation among non-metropolitan counties was also significant.

In 1958, in some of most rural parts of Hungary, such as Békés, Tolna, and Szolnok Counties, the share of the population serviced by sewage pipes was as low as 1-5%. The situation was somewhat better in the centrally located Pest County where coverage was 5-10%. Hungary's industrial counties performed only slightly better than Pest, with 15-20% in Borsod, Komárom and Veszprém Counties and 20-25% in Baranya, Győr, and Fejér Counties.[47] Wastewater systems almost exclusively covered urban settlements in 1958. In villages where 5.9 million Hungarians, or

nearly 60 percent of the population lived, sewage systems were virtually nonexistent, serving only 1.5% of the rural population.[48]

According to László Szitkey, a water engineer specializing in wastewater treatment in 1958, found the threat posed by untreated and discharged wastewater very dangerous: "Discharged wastewater is causing at least as large a public health problem as the absence of sewage networks." [49] Szitkey condemned the quality of existing wastewater treatment plants in 1958: "Most wastewater pipe networks lacked wastewater treatment systems. On the one hand, existing wastewater treatment plants do not provide adequate cleaning results. On the other hand, they are overloaded and operate with low efficiency or without any results."[50]

## 6. Economic Policy in East-Central European Countries in the 1950s

Czechoslovakia (especially Bohemia and Moravia) and East Germany have already witnessed notable degree of industrialization before the implementation of the extensive Stalinist growth. Therefore the relevance of primitive accumulation was even less in these countries than in Hungary. This was because initial accumulation in Stalinist state-socialist states were mostly the result of the increased workforce and the most intensive production of already existing production units. Most of the new and reconstructed plants took years to build in ideal circumstances. However notable delays were commonplace throughout the region. Developers did not yet have the experience for such large scale production units, substantial materials were often lacked because of the shortage or because they were hard to obtain from the West. Because new industrial plants were about to began their operations later, and the initial ambitious targets of industrialization were further increased several times in the plan period it was impossible to reach the required targets. Despite of the economic reform attempts, Stalinist investments were carried on and build up with substantial delays. The abandonment of key projects could have harmed the regime even more.

Poland, similarly to Hungary, was less industrialized in general than the Czech lands and Eastern Germany. After the already initially ambitious First Six Year Plan targets, plan revisions were made in 1951-52. The total output was increased by almost 17 per cent. Most of the new targets were relocated for the favor of the war industries. As a result, between 1949

and 1955 the output of the metal-working industries almost tripled. There was an over 130 per cent growth in chemical production and construction materials as well. Only 23 per cent of the total output came from new enterprises, that was because of most investments were not operational by the end of the 1950s. Similarly to other ECE countries during the early planning period, economic policy and its main institutions have changed a number of times. This made construction and planning even harder. The main reason for changes were often the search for effective organizational structure. Therefore most of production growth was initiated by working old plants more intensively and with more workers.[51] In this first period of industrialization productivity was still lagging behind pre-war levels. These tendencies were similar to what was happening in Hungary and to some extend Czechoslovakia and East Germany.

Unemployment was targeted to be ended, and women were encouraged to take full time jobs. This put dual pressure on women under the 'cover' of gender equality, because now they had to fulfill expectations both at home and in work. In addition, political prisoners, students and pupils were also involved in the production process.

In Poland the number of workers dramatically grew. Between 1948 and 1953 it went up from 308,000 to 771,000 in construction, and from 220,000 to 515,000 in machine building. Most new workers moved to growing cities where construction could not keep up with the demand. Overcrowded and deteriorated housing conditions were commonplace.

Poland's half-war economy was not dissolved after the death of Stalin. Compared to Hungary, where Imre Nagy, Chairman of the Council of Ministers relaxed oppression and began a new course of somewhat more livable communism, in Poland the Stalinist regime was not shaken until the Polish October. The plan changed somewhat however, the Ninth Plenum of the Central Committee of the United Workers' Party in September 1953 scaled down the total plan budget, but only took a few half-finished plants off the list for an unspecific period of time, and decided to finish most of the investments with a few or more years of delay.

One of the flagship investments of the era was the steel plant and city of Nowa Huta. Here a steel plan and workers' housing units were initially planned to be constructed by the Reyn Engineering Company based in Chicago before the Second World War. In the new Communist era 'Nowa Huta' was destined to be the seat for Poland's new metallurgical combine. It has been discussed to be built on the meeting of the Central United Metallurgical Industry in 1945. The Central Administration for

Metallurgical Industry formed on 17 May 1947 and the government decreed the construction of the works and the housing estates on 26 January 1948. Work on Nowa Huta began simultaneously to other gigantic investments in ECE in mid-1949. It took five years to put the first stage of the plant into operation and it was opened in 1954.[52]

Central planning was introduced in East Germany during the second half of 1948, which was followed by the First Two Year Plan (1949-50) and the First Five Year Plan (1951-55). Similarly to Hungary key sectors of the industry were nationalized. By 1950, 68 per cent of industrial production came from the public sector and agriculture was not yet collectivized. [53] Parallel to the First Two Year Plan a Soviet-style Stakhanivite movement was introduced in East Germany in 1948. Adolf Hennecke, who was a symbolic figure of this production enhancement movement increased his daily output of coal by 380%, and was pledged by the SED (Socialist Unity Party of Germany) as the hero of labor.[54] During the implementation of the planning system fundamental changes took place in the East German flow of trade. Whereas in 1947 75 per cent of trade was with West Germany and only 7 per cent was with other socialist countries, next year trade with socialist countries (44%) already suppressed West German trade slightly (43%). This trend continued and by 1951, 76 per cent of GDR's trade was with socialist countries, and West German trade shrank to a mere 7 per cent.[55]

International tensions in Korea, Yugoslavia and especially with West Germany drove military spending up. In 1 July 1952 the People's Police in Barracks, *Kasernierte Volkspolizei, KVP* was created and plans were laid out to increase the total number of KVP troops up to 200,000 in a short period of time. This force was the basis for the East German People's Army.[56] Soviet-type industrialization and a growing pressure for larger armed forces played a major role in the outline of the First Five Year plan in 1950. As a result 1.8 million tons of iron ore, over 210 million tons of various types of coal were to produced with a new merchant fleet of 22 ocean-going vessels during the five year planning period.[57] During the planning period outstanding achievements were recorded. Steel production for example rose from 999,000 tonnes in 1950 to 1,517,000 tonnes in 1955 and similar success was reported in coal mining and the chemical industry. These successes, similarly to Hungary were achieved to the expense of light industry and living standards. Most consumer goods were in short supply and butter, meat and sugar were still rationed. Wages hardly rose and the collectivization of agriculture discriminated

many of the private farmers. Prices were escalating, and the government decided to control its growing deficit by raising production norms. More and more decided to leave the country. According to the statistics 165,648 fled the GDR in 1951, a year later this figure grew to 182,393. The year of the death of Stalin hold the record with 331,390 leaving the GDR due to growing hardships of the economy. [58]

The path for Czechoslovakia was very similar. It was soon integrated to the socialist bloc and its industries were developed to supply provide heavy industrial outputs. Also the agriculture was neglected and the revision of the Czechoslovakia First Five Year plan (1949-1953) in 1951. Czechoslovakia's foreign trade was redirected to the socialist bloc and her exports grew to socialist countries from 40 per cent in 1948 to 78 per cent to 1953.[59] As a result of the new forced structure of industry Czechoslovakia shifted from exporting mostly consumer goods and some raw materials such as coal to the export of machinery and also raw materials. Between 1948 and 1953 the export of machinery grew from about 20 % of the total exports to 42 per cent, while the export of consumption goods decreased from 30 per cent to 12 per cent. The 1951 version of the plan targeted even more unrealistic outputs the original 1949 version. Some of the main products such as iron ore, cement, motor vehicles, meat had to be more than doubled by the end of the plan period. Other products such as coal, steel, fabrics had to reach a "mere" 40-70 per cent growth in five years period. Naturally the plan was failed to fulfilled in Czechoslovakia as well. Even the original 1949 targets were hardly accomplished in many segments. Shortage was commonplace in all major raw materials and work force as well. Industry used to be already an important sector in Czechoslovakia the number of workers increased from about 1.5 million to over 2 million between 1948 and 1958. Industry was rather developed and also energy wasting, and as a result Czechoslovakia had one of the highest energy consumption per capita in the world by the second half of the 1950s, approximately on the level of the United Kingdom and approximately double of other ECE states such as Poland and Hungary.[60]

Growing tensions finally escalated into the 17 June uprising in which over 500,000 workers were involved and which was ruthlessly crushed by the Soviet army. All together over 200 people were executed after the uprising and about 1,400 people received life sentences. As a result, the East German government was forced to alter the plan as a result of the June

1953 demonstrations following Stalin's death, and gave higher priority to consumer goods and and food rationing in 1954.

After the death of Stalin possibilities of economic reforms were investigated throughout ECE. Already planned and constructed production units were not shut down, but were extended and amended in the coming period. Soon the acceleration of industrialization and urbanization led to similar environmental issues that had been witnessed in Great Britain and Germany earlier in the nineteenth and twentieth centuries.

## Concluding Remarks

Rapid economic, industrial, and technological changes had tremendous impact on the environment in Europe after the beginning of the Industrial Revolution. First negative environmental consequences were observed in Britain, and when economic development accelerated in Germany, similar negative environmental trends appeared there.

East-Central European countries did not have to battle with widespread pollution until the introduction of Stalinist economic policies in the late 1940s. These policies immediately triggered industrial production in old plants and initiated a large number of new industrial units. Enhanced production was soon followed by the rapid rise of pollution.

Both Western-, and East-Central European countries battled with environmental pollution in the 1950s. The somewhat flexible economic structure of state controlled capitalist countries however predestined Western European countries to be more successful when targeting environmental problems.

In East-Central Europe, reform attempts after Stalin's death failed, and were only partly and not adequately implemented later. As a result, the structure of the economy was on the one hand dependent on growth, on the other it was too rigid to be able to combat with its environmental pollution effectively. This led to the massive destruction of the environment. A problem that was seriously targeted by many of the state-socialist regimes, but in the long run could not be solved.

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12 David Blackbourn, *Fontana History of Germany, 1780-1918: the Long Nineteenth Century* (London: Fontana, 1997), 178-180.

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15 Volker Berghahn, "Demographic growth, industrialization and social change," in *19th century Germany. Politics, Culture and Society 1780-1918,* ed. John Breuilly (London:Arnold, 2001), 185-186.

16 Pages between 21 and 24 are based on: Cioc, *The Rhine*.

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18 Andre Armengaud, "Population in Europe 1700-1914," in *The Fontana Economic History of Europe. volume 3. part 1.* ed. Carlo M. Cipolla (London: Fontana/Collins, 1973), 29.

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23 George S. Rice, John A. Davis, *Potash Mining in Germany and France*, Bulletin 274, Department of Commerce, Bureau of Mines, Washington D.C.: Government Printing Office, 1927. 1-7.

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28 Polish GNP fell to 38 per cent of pre-war levels in 1945. Anita Prazmowska, *Poland: A Modern History* (London-New York: I.B. Tauris, 2010), 170-171.

29 Mária Ormos, *Padovától-Trianonig 1918- 1920 (From Padua to Trianon 1918-1920)* (Budapest: Kossuth Könyvkiadó, 1983), 6-9.

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32 Similar tendencies were true for both France and the United Kingdom, where the French Communist Party and the British Labour Party attracted a large share of the population.

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36 Joseph Held, *Dictionary of East European History since 1945.* (London: Mansell, 1994), 138 ("Communist Party of Czechoslovakia").

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42 The crisis of the economic system was marked with "disruption of food supplies, the collapse of the energy system, frequent power cuts and widespread shortages" both in Hungary, and in East-Central Europe. Ivan T. Berend, *The Hungarian economic reforms, 1953-1988* (Cambridge-New York: Cambridge University Press, 1990), 17.

43 Preface: "Uralkodóvá vált a mennyiségi fejlődés hajszolása, közben a gazdaságosság, a minőségjavítás, a termelés költségeinek csökkentése és a nemzetközi együttműködés követelményei háttérbe szorultak."
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44 I. FEJEZET. "A hároméves terv fő feladatai." (CHAPTER I. "Main goals of the three year plan") 9.§ Ibid.,

45 The iron-, and steel works in Stalintown (Sztálinváros) were named as Stalin Ironworks (Sztálin Vasművek) and was renamed to Danube Ironworks (Dunai Vasmű) in 1956, and Stalintown was renamed to Dunaújváros in 1961.

46 László Szitkey, "Szennyízcsatornázásunk helyzete 1958. év végén (The Level of Waste Water Management at the end of 1958 in Hungary)," *Vízügyi Közlemények* 41, no.3 (1959). 315.

47 *Ibid.*, 330. Figure 6. Magyarország megyéinek csatornázottsága (Waste water coverage in the counties of Hungary).

48 *Ibid.*, 328. Figure 5. Városi, falusi és az összlakosság szennyvízcsatorna ellátottsága (Waste water coverage in villages, towns and in general in Hungary).

49 "A szennyvízcsatornázás hiánya miatt keletkező közegészségügyi ártalmak mellett legalább ugyanolyan mértékű károkat okoznak a *tisztítás nélkül kibocsátott szennyvízek is.*"
*Ibid.*, 327.

50 "Szennyvíztisztító-telepek viszont csatornaműveink többségénél hiányoznak. A meglévő tisztítóberendezések részben nem biztosítják az előírt tisztítást, részben túlterheltség miatt alacsony hatásfokkal, vagy gyakorlatilag eredménytelenül működnek."
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60 Jan M. Michal, *Central Planning in Czechoslovakia, Organization for Growth in a Mature Economy* (Stanford: Stanford University Press, 1960), Based on Table 2.1, p. 28.

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