

THE POLITICAL ECONOMY OF HYDROPOWER IN THE COMMUNIST SPACE: IRON GATES REVISITED

REMUS CREȚAN* & LUCIAN VESALON**

**Department of Geography, West University of Timișoara, Bulevardul Vasile Parvan. No 4, 300233 Timișoara, Romania. E-mail: remus.cretan@e-uvt.ro*

***Department of Political Science, West University of Timișoara, Bulevardul Vasile Parvan. No 4, 300233 Timișoara, Romania. E-mail: lucian.vesalon@e-uvt.ro*

Received: April 2015; accepted October 2016

ABSTRACT

This paper proposes a critical discussion of the political economy of hydropower construction in the communist space. We use political economy, economic history and political ecology literature in order to reveal the economic and political relations in which hydropower is embedded in socialist states. The case analysed is the Iron Gates, a joint Romanian-Yugoslav project which raises specific questions about the techno-political framework of the new 'hydraulic landscape' and its place in socialist economies and societies. The case reveals important transformations in the political and economic relations within the Soviet bloc and provides a description of the complex institutional setting used in the construction of the hydropower system. In parallel, the paper explores the contribution of political power in the construction of the Iron Gates and especially its use in connection with the ideological production of the new communist regime.

Key words: Hydropower, communism, industrialization, Romania, Yugoslavia, Iron Gates

INTRODUCTION

Hydropower systems are seen as core elements in the processes of economic and social development. They provide cheap energy and water resources for economic development, playing a key role in the processes of urbanisation and industrialisation. At the same time, they are embedded in a complex web of social and political relations, reflecting economic imperatives, political goals and also a distinct vision of modernity (Scott 1998; Josephson 2002; Swyngedouw 2007). In other words, hydropower systems are key signifiers of development which are politically and ideologically laden. In this paper we discuss the joint construction

between Romania and Yugoslavia of the Iron Gates hydropower and dam system on the Danube during the communist period. Constructed between 1964 and 1972, the 'Iron Gates' is the biggest hydropower project ever constructed in Romania and Yugoslavia, and is highly representative of the social and political relations underpinning the development of hydropower systems in the two states. It was one of the largest projects of that time and remains today the biggest hydropower project in the region.

Our aims with this paper are threefold: an analysis of the politics of industrial development; a discussion of the distinct national and international institutional settings; and a consideration of the socialist ideology

involved in the planning and construction of the Iron Gates. The focus of the paper is mainly on the Romanian side of the project, given its centrality in the broader context of the development politics established by Ceaușescu's regime, the Yugoslavian participation being considered in connection to the bilateral relations between the two states. The case is still insufficiently documented, existing studies on hydropower in Romania usually being focused on technological and economic aspects, which by no means cover the multiple dimensions of such projects (Pop 1996), especially their political and ideological functions. The Iron Gates case is worth attention also because of the specificities of nature-society relations in the communist context and its special position within the established model of industrial development in communism. It reveals the fundamental contribution of political power to the development of the project and the transformations of international relations within the communist space. At the same time, it was one of the building blocks of the socialist policies of industrialisation and urbanisation. It also embodies important political and ideological features of the communist regime.

This study combines the political economy of socialism (Crowther 1988; Kornai 1992; Woodward 1995), political ecology (Scott 1998; Josephson 2002; Pritchard 2011) and economic history (Murgescu 2010), seeking to determine the particular forms of nature-society relations in the communist context and their materialisation through the Iron Gates hydropower and dam complex. The political economy of hydropower is a core dimension in which we discuss the place of the Iron Gates in the process of industrialisation during communism, its impact on economic growth and its relation to population policies. In addition, we ask what specific political arrangements, actors and previous experiences, both at national and international level, were mobilised for the Iron Gates construction. The ideological instrumentalisation of the Iron Gates by the two political regimes is examined in the inaugural discourses of the two heads of state in order to understand the contribution of the

communist leaders in shaping the representations of hydropower. These dimensions of analysis reveal the complex interactions between multiple actors, with blurred lines between political, economic and technological relations within and between the two communist states.

HYDROPOWER AS POLITICAL POWER

Hydropower units are tremendously complex systems with multiple functions: the production of electricity, the provision of water for irrigation, the improvement of navigation and river flow management being of key importance. On the other hand, hydropower opens up new opportunities for economic development, creating a 'techno-political' environment in which nature becomes economically and financially productive. By fueling economic growth, industrialisation and urbanisation, they contribute to the development of new social and economic relations. Not least, hydropower is imbued with social development imperatives and political power (Scott 1998; Pritchard 2011).

The relation between nature and society in the context of industrial development is of particular interest in political ecology. The complexity of society-nature relations and the restructuring of space in specific development contexts are a starting point in understanding human interventions in nature and the political dimension involved in the construction of big industrial projects (Smith 1990; Swynge-douw 2007). Such complex interactions are accounted for through different terms. For instance, 'techno-politics' is used to denote 'a particular form of manufacturing, a certain way of organizing the amalgam of the human and nonhuman, things and ideas' (Mitchell 2002, p. 43). White's (1995) metaphor of 'organic machine' also points to the fusion of nature and human environment in industrial technology. Similarly, Demeritt (2005) discusses the epistemic condition of such artificial objects, while Hecht (2011, p. 3) speaks about 'hybrid forms of power embedded in technological artifacts, systems and practices'. Pritchard (2011, p. 11) offers another alternative conceptual framework, centred on the

term ‘envirotechnical regime’, referring to the “nature” of technology, or the ways nonhuman nature affords material constraints to technological development and use, ultimately partly constituting “technology” itself. These ideas are fundamentally related to the principles of development originating in what Scott (1998, p. 89) calls ‘high modernism’, defined as ‘a strong [...] version of the beliefs in scientific and technical progress that were associated with industrialization in Western Europe and North America from roughly 1830 until World War I’ and coupled to ‘a supreme self-confidence about continued linear progress’. According to this perspective, high modernism applies both to the pre-war period and to the late twentieth century, and equally to capitalist and non-capitalist regimes.

All big industrial projects, and especially hydropower projects, are included in a vast web of political actors, decisions, and regulations (Pritchard 2011). They are based on the needs of particular social systems and are part of political agendas. Hydropower challenges the state budget and the productive capacities of states by its need for large funding schemes, huge resources and a massive workforce. The construction of hydropower systems is based on complex political decisions and co-operation mechanisms. Being a tremendously complex enterprise, it requires the involvement and co-ordination of numerous state actors and international organisations. Hydropower systems require, for example, changes in the national energy and transportation infrastructure systems, which is only possible by complex state planning. As was rightly noticed, ‘building large dams across major rivers is an activity that only national governments can undertake, not just because of the high capital costs involved but also because only the state can organise the fair distribution of benefits and costs across its citizenry’ (Heming *et al.* 2001, p. 208). Concomitantly, hydropower systems also offer vital opportunities for economic growth, through their horizontal impact in related industries and by stimulating the development of new economic sectors.

State power plays a central role in the planning, construction and use of hydropower systems. Not surprisingly, Swyngedouw

(2007) rightly speaks in this context about ‘the state as master socioenvironmental engineer’. Hydropower projects are intimately connected to political ideologies and are almost invariably seen as national symbols signifying technological progress and the economic might of the nation. They are used by political leaders to forge national solidarity, but also as signifiers of their power and leadership. In the international context, hydropower signifies either the independence (energy autonomy) or, on the contrary, as in the case of Iron Gates, the commitment of neighbouring states to engage in friendly relations and common enterprises. Especially in developing countries, hydropower is also used as a means of legitimising new political regimes or leaderships (Scott 1998).

The empirical sources analysed in the paper are grouped into three different categories. The first category includes historical and economic data about hydropower in Romania and about industrial development in the 1960s and 1970s. In order to understand the contribution of political power to the development of the hydropower complex, we use a literature dedicated to the analysis of the social and economic impact of hydropower growth in Romania (Turnock 1979; Pop 1996; Murgescu 2010). The second category comprises institutions, decisions and official documents from the national and international level which regulated the construction of the Iron Gates. In particular, we use the official documents on which the planning and construction of the Iron Gates was based, a primary literature with details regarding the construction process, statistical data provided by the Romanian Institute of Statistics, and the Romanian Register of Large Dams. Additionally, historical statistical data taken from Statistical Yearbooks from the late 1960s and early 1970s are used to frame empirically the political economy of the Iron Gates. The special laws and bilateral agreements are examined in order to map the institutional setting specifically produced to govern the hydropower project construction and its subsequent operations, at the national, bilateral and international level. The third category presents the inaugural discourses of the two heads of state, which are discussed in order to reveal

the political-economic nexus specific to the expansion of the hydropower systems in the communist context and to reveal the main political signifiers employed for articulating the project within the communist politics of development.

THE COMMUNIST POLITICS OF HYDROPOWER

Hydropower is intrinsically techno-political, political power being fundamental in the transformation of nature and society through industrialisation. In communist states, hydropower embodied the dream of social and economic modernisation, as well as specific values and symbols of the communist ideology. It was fundamental for the development of a new communist society and instrumental in the creation of a new model of agriculture and industrial development. For instance, Lenin's well known interest in the development of electricity in the Soviet Union was central to his vision of modernisation, and remained a core feature of the socialist development model in general. As Scott (1998, p. 166) notes, electricity in communism gained a 'nearly mythical appeal'. Later, Stalin continued and amplified the Leninist perspective, for example in the massive construction works on the Volga River (Josephson 2002). Hydropower plants were thus central to the creation of the new social and economic order, 'the multilateral-developed society'. Hydropower in general, and, we argue, Iron Gates in particular, is among the best examples of the 'priority of big installations' in the communist model of industrial development and of its "cult of scale" and gigantomania' (Kornai 1992, p. 176). The scale of such projects, together with the totalitarian politics involved in their planning were a typical form of what Josephson (2002) calls 'brute force technology'.

Communist regimes from Central and Eastern Europe produced particular patterns of industrial development based on the central role of communist authorities in development planning (Turnock 1970; Verdery 1991, 1996). Especially important was the contribution of political leadership in

shaping big industrial projects. A second relevant feature for our case is the correlation between communist policies of economic growth and the fostering of international co-operation within the communist bloc (Kornai 1992; Woodward 1995). Another significant element is the articulation of industrial development with the planning of population policies (Murgescu 2010), which are particularly determined by high modernist principles, given the macro-social vision of development (Scott 1998, p. 95).

Within the current territory of Romania, the first hydropower plants were built in the early twentieth century in the Banat Carpathians. The heyday of hydropower in Romania was during communism, between the 1950s and the 1980s, with the peak of construction reached during the 1970s. The first large dam and hydropower plant was Bicaz, constructed on the Bistrița River and inaugurated in 1960. In 1966 the hydropower plant Vidraru, on river Argeș, was commissioned. During the 1970s two other large hydropower systems were opened: Lotru and Mărișelu. The Iron Gates was built during the period 1964–1972 and included a hydropower plant, a dam and an improved navigation system on the Danube. The hydropower plant produced about 20 per cent of the electricity produced during the communist period (Registrul Român al Marilor Baraje 2013).

Several elements of the 'Iron Gates' project were part of a discontinuous technological history, the first plans for improving transportation and stream 'regularisation' being conceived in the late nineteenth century and then reconsidered in the 1930s. As early as 1948 the United Nations Economic Commission for Europe (UNECE) had identified the potential for building a dam on the Danube gorges (Lagendijk 2014). The core element in the early multilateral co-operation regarding the Danube was the improvement and management of navigation. Hydropower was therefore included in the co-operation framework within the communist bloc.

In the twentieth century the Danube gained a special geopolitical importance. After the First World War, and especially

during the Cold War, the Danube was involved in a 'hydro-political struggle' (Lagendijk 2014, p. 5). This geopolitical relevance of the river was not limited to the riparian states. International interest in the Danube became visible immediately after the First World War, the US and USSR disputing their influence in controlling the management of the river. Navigation and the construction of dams were the key issues under debate. Besides the involvement of the Cold War blocs in controlling the strategies of development through the Danube commission, there was also tension between national control and the international regime of the river (Cattell 1960). Another organisation involved in discussions regarding the hydropower potential of the Danube was the Council for Mutual Economic Assistance (CMEA). As early as 1925 the possibility of building a hydropower plant at the Iron Gates was considered. The tensions between the USSR and Yugoslavia were also present in the council, leading to the decision to plan the construction of Iron Gates independently of the CMEA and in closer connection with the Danube Commission (Lagendijk 2014).

The geopolitical interests in controlling the Danube were highly significant in the establishment, organisation and subsequent activities of the European Danube Commission and afterwards of its successor, the International Danube Commission. The rivalry between the superpowers and between the riparian states influenced the works of the Danube Commission. The commission had multiple tasks, focused on regulating navigation and providing trans-national legal frameworks and other tools for the management of the Danube. Within the communist bloc, the tension between the USSR and Yugoslavia had a deep impact on the management of the Danube and specifically on the possibilities of imagining large development projects on the river. Following the Danube River Conference in 1948 in Belgrade, the Danube Commission was an arena of disagreements between Stalin and Tito, leading to the marginalisation of Yugoslavia in the Commission and attempted at minimising Western influences in the communist space (Cattell 1960). The Danube Commission was eventually

accepted as the main regulatory body of river management (Linnerooth-Bayer & Murcott 1997). At the international level, the Danube Commission was one of the key organisations with a significant involvement in the planning of a large dam at the Iron Gates. Moreover, the United Nations had a rather marginal involvement, only being consulted and informed about the new context resulting from the construction of Iron Gates.

A turning point in the international management of the river followed the death of Stalin in 1953. After this, Yugoslavia was progressively integrated into the organisation and decisions of the Danube Commission. Interestingly, at a more general level, the Danube Commission was seen as a testing ground for changes in the USSR's international relations, the most important being 'the switch from bilateral relations to multilateral relations within the Soviet bloc, especially in technical areas, and [...] the restoration of closer non-political relations with the West and closer co-operation with the technical aspects of the United Nations' (Cattell 1960, p. 389). The Iron Gates construction could therefore be seen as a marker of change in Yugoslav-Soviet relations in particular, and in multilateral relations within the Communist bloc in general, which functioned as political pre-conditions for the construction of the hydropower system. It also marked the improvement of East-West relations in Europe, mainly concerning co-operation between riparian states. Improvements in navigation and economic relations were the most direct consequences of this change.

One sensitive issue involved continuing the co-operation between the two states, with Ceauşescu the new Romanian leader, continuing the initiative and capitalising politically on the construction of the Iron Gates. On the Yugoslav side, Tito was directly involved in negotiating the bilateral agreement, first with Gheorghiu Dej and then with Ceauşescu. This bilateral co-operation was remarkably efficient, given the tense history of relations between the two countries and the centrifugal position of Yugoslavia within the communist bloc during the Stalinist period. Following the death of Stalin, the

socialist states managed to reduce the direct Soviet control of their political affairs (Crowther 1988), which had also a direct consequence on economic strategies of development.

At the bilateral level, a mixed Yugoslav-Romanian commission was created and invested with all the technical and administrative issues of the project (Act final 1964). The document was signed by the two parties in Belgrade, on 30 November 1963, by the presidents of the two states, Gheorghe Gheorghiu Dej and Iosip Broz Tito. The investment initially calculated was US\$400 million, equally shared by the two countries (Decret no 137 1964, art. 5, paragraph 2). An equal share of the benefits for the two states was stipulated, although how this was to be distributed to the population was not mentioned in the agreement. In the official documents, the communist authorities specifically referred to 'the use of hydroenergy resources of the Danube in the interest of the peoples to which they belong, and to contribute at the same time to the use in the general interest of the opportunities offered by the river for navigation development' (Decret no 137 1964).

A complex institutional setting was created for the management of the Iron Gates system. Several types of institutions and organisations of different levels participated in the process of planning and constructing the hydropower complex. At the national level, political, administrative and economic actors were put together in a web of decision-making and regulation-setting. This special setting was co-ordinated from the summit of the state authorities, by the presidents, ministers and the communist party leadership. Central and local administration co-operated with economic enterprises for the implementation of the project. Such complex institutional frameworks were not unusual in the socialist top-down management, the idea of a close co-operation between all institutional actors involved in economic development being stipulated in the five-year plan, aimed at a 'timely organisation, especially in those areas requiring a longer period of preparations/investments, the assimilation of new

products and the introduction of new technologies' (Legea nr 10 1971).

Highly complex bilateral co-operation between multiple state institutions had been established for the building and the subsequent operation of the hydropower and dam complex. For the management of navigation issues on the Danube in the Iron Gates section the river administrations of both countries were involved. Additionally, the ministries of energy and mining were also part of the management. The technical co-operation involved Romanian and Yugoslav specialists, but also numerous experts from the communist and from Western states. For the elaboration of the project, several institutions from both countries were involved, most notable being the Hydrotechnical Projects from Bucharest and Ergo Project from Belgrade. The national banks of the two states co-ordinated the financial transactions between the two parties, neither state relying on foreign loans.

Despite the much discussed idea of an 'autonomous' development of the two socialist states, the construction process required intensive commercial exchanges with foreign companies, both from the communist (USSR, Hungary, Poland) and non-communist markets. For instance, high-power Kaplan turbines were imported from the USSR (Pop 1996). At the same time, suppliers from Austria, Belgium, the Federal Republic of Germany, Italy and Switzerland, and from several developing countries also provided equipment and raw materials for the construction of the hydropower plant and the dam (Convenția de Decontare 1963). Benefiting from the improvement of economic relations with Western countries during the 1960s (Montias cited in Crowther 1988), a significant part of the industrial equipment was imported from the West.

THE IRON GATES AND THE POLITICAL ECONOMY OF THE 'HYDROPOWER RUSH'

The 1950s and 1960s were decades of 'hydropower rush' at a global level. China was the most active hydropower constructor of that

period, and Japan was one of the earliest hydropower pioneers (McCully 2001). Involving large funding schemes and advanced engineering, the hydropower dream was initially available only to a limited number of countries, such as the USSR, USA, Canada or China. In this context, the fact that Yugoslavia and Romania could build big dams and hydropower plants had a special importance for the two communist regimes. Hydropower was a core element in the model of industrial development and social change in communist Romania and Yugoslavia. It offered cheap electricity for the rapid processes of industrialisation, urbanisation and economic growth envisaged by the regime. It also supported the emergence of new industries, especially those with massive electricity consumption, the so-called 'energy-hungry' sectors, and the growth of the already existing industrial sectors.

Central planning was a notorious key feature of the socialist economies. Although it was developed differently and implemented in various socialist states and in different stages of the socialist system, it remained a basic means of political control of the economy. In tandem with the five-year plans, central planning was fundamentally connected to 'modernisation' and linked to 'visual images of heroic progress toward a totally transformed future' (Scott 1998, p. 95). Five-year plans were a fundamental political-economic framework which affected all aspects of production during socialism. In Titoist Yugoslavia there was a relative degree of decentralised economic decisions, although the central government retained the *de facto* exercise of central planning (Woodward 1995). By contrast, in Romania central planning and the five-year plans were rigidly applied, '[its] development strategy remain[ing] hinged on tightly centralized planning and high rates of accumulation' (Crowther 1988, p. 14).

Hydropower plants became an integral part of the five-year plans, the accomplishment of which was heavily reliant on water supplies for agriculture and electricity. Electricity being intrinsically 'centralising' (Scott 1998), all the more so in the case of the communist central planning of hydropower

development. In Romania, a five-year plan had begun in 1971 and the opening of Iron Gates in 1972 made a significant contribution in attaining its stipulated economic development goals. In the plan were included specific measures for the management of water resources (Turnock 1979). Average growth rates of 11 to 12 per cent were stipulated and predicted in the 1971–1975 five-year plan. The focus on industrial development remained a core feature of the centrally-planned economy. The industry continued to be seen as a means for social and economic 'modernisation', which legitimised high investments in its development, reaching 60 per cent of the total state investments (Legea nr. 10 1971). Additionally, the industrial sector was prioritised because it provided much needed foreign currency from exports.

The policies of 'forced industrialisation' were embedded in the political structure and ideology of the communist regime, 'the industry was considered the economic sector bearing historical progress, and big industrial enterprises were a form of economic organisation easiest controlled within the command system' (Murgescu 2010, p. 336). Forced industrialisation was connected to a more encompassing 'forced rate of growth' economic model. State investments were based on several principles establishing core priorities which reflected both the ideological drive and the economic model of the regime. Well known are the 'priority of domestic production over imports' and of 'the production sphere', but the most important for our case is a set of three specific economic imperatives: the 'priority of industry', 'the priority of heavy industry', and the 'priority of new installations' (Kornai 1992, pp. 173–174). Related to the focus on new projects, Kornai recalls the well-known aspect of the political-economic nexus of the socialist model of development: 'The motivation is mainly political. Establishment of a brand new factory makes a far more spectacular example of overcoming backwardness and of achieving fast development' (1992, p. 174).

During the Ceaușescu period, steady rates of industrial growth were achieved, with more than half of the GDP produced by

industry. Besides large investments, massive allocations of workforce to industry were dictated, especially in heavy industry and big industrial systems (Crowther 1988). A specific form of industrialisation was the creation of mono-industrial areas, especially in the mining sector (Vesalon & Creţan 2013a, 2013b). The Iron Gates project attracted numerous workers from other parts of the country and was one of the most labour-intensive projects of the period. Army recruits were also brought in for certain tasks in the project. Additionally, the total workforce employed in the production of electric energy in 1972 was 39,300 workers out of a total of 2,231,700 employed in the industrial sector (Anarul Statistic al Republicii Socialiste România 1973).

Although forced migration is not the subject of this study, it should be noted that the building of Iron Gates led to the resettlement of a large number of people. The construction of the reservoir affected a large area and led to the displacement of many people. The most affected populations lived in the town of Orşova, situated on the banks of the Danube, and on the Ada Kaleh Island. On the Romanian side, ten localities were affected by the construction of the reservoir and their population was entirely or partially resettled. The town of Orşova was partially rebuilt. Nine villages and three towns were affected on the Yugoslav side of the Danube.

Big industrial projects played an essential role in the economic growth of socialist states. In Romania the GDP grew from US\$12,975 million in 1948 to US\$90,051 million in 1989; during the 1970s the highest rates of growth reached US\$70,175 million in 1972, the year of the Iron Gates inauguration (Maddison 2003). High rates of economic growth were pursued to demonstrate the 'socialist's system superiority' (Kornai 1992, p. 161). The construction of the Iron Gates benefited from an average industrial growth of 11.8 per cent and of an economic growth of 7.7 per cent during the 1966–1970 five-year plan (LEGEA nr. 10 1971). In turn, hydropower was a key factor in economic growth, having a higher impact on economic development in comparison to other industrial sectors (Josephson 2002).

The Iron Gates hydropower system was a fundamental component in the national energy production of both states. The total electrical energy produced in Romania rose from 1,230 million KWh in 1938 to 35,088 million KWh in 1970, out of which 148 KWh and 2,773 million KWh respectively was accounted for by hydroelectric power. Energy imports during the period 1955–1970 varied from 1 million KWh in 1955 to 28 million KWh in 1970, with a peak of 462 million KWh in 1966 (Anarul Statistic al Republicii Socialiste România 1971). During the first decade of its functioning, the Romanian part of the Iron Gates produced an annual average of 5,934 million KWh (Pop 1996). The energy sector benefited from record figures in investments during the entire communist period (Murgescu 2010). Although the production of hydroelectric energy in Romania was significant, the Yugoslav production was for instance in 1980 approximately double, both states being situated in the top half of the largest energy producers in Europe (US EIA 2014).

In terms of the international political economy, the construction of Iron Gates was interpreted by the authorities as a counter-imperialist modernisation project which would ensure a relatively autonomous development path. The capacity to pursue a more independent strategy of industrial development, especially de-linked from USSR control, was considered an important element in Romanian international relations within the communist bloc (Turnock 1970). The search for an autonomous path to development was especially sensitive, given that the pre-war economy and international trade presented several features specific to 'peripheral' economies of the Third World (Crowther 1988). Despite this goal, the centrally planned economic system allocated record investments to industrial development, which in the case of Romania led to 'serious imbalances' and to lower consumption rates (Murgescu 2010, p. 320).

The differences between the two socialist systems at the time of Iron Gates construction were highly significant. Romania was in a period of shifting away from the Stalinist political and economic model, but largely

remained a highly centralised system. On the other hand, Yugoslavia was experimenting with a more decentralised and autonomous model of development, a model which was sometimes too optimistically regarded as a 'true socialist' alternative to the state socialist model followed in the communist bloc. However, it can still be considered as an alternative socialist approach to economic development, hybridised with market reforms and different patterns of state control of the economy (Bockman 2012). Despite the relaxation of Soviet control within the communist bloc, Romania 'remained committed to rapid industrial transformation and tight political control' (Crowther 1988, p. 14).

Industrial development reflected the ideal of social modernisation (Scott 1998). The growth drive of the communist economy during this period was politically motivated, although the ideological representations of the society-economy relations defined social development as the goal of economic growth. As the 1971–75 five-year plan stipulated, 'characteristic to the stipulations of the five-year plan is the steady dynamism in growth of material production, the modernisation of the entire economic structure and the acceleration of qualitative processes of development, the efficiency enhancement in all areas of activity and, on this ground, the continuous growth of the living standards of the entire people' (Legea nr. 10 1971).

Hydropower was connected to the specific population and social development policies. The regime planned a rapid urbanisation and a social 'modernisation' process, which included social homogenisation and the reduction of economic disparities between regions. The Romanian communist development policies integrated a strategy of reducing regional economic disparities (Turnock 1970). Population policies were intertwined with the drive for rapid industrialisation and economic growth. Two elements of the politics of population were especially important in connection to the communist development model: population growth and the change of the social structure of socialist societies. Population increased dramatically in Romania during Ceaușescu's regime. Steady rates of population growth averaged

approximately 125,000 annually (Maddison 2003). Forced migration to urban centres and the building of new cities were deeply connected to the dream of rapid industrialisation (Crowther 1988). Besides its contribution to the structural change of the economy, industrial development aimed at a profound transformation of the social structure, seen as a society of urban workers (Verdery 1991, 1996). Urbanisation and industrialisation were ultimately means of building a nation of the working class which was supposed to eventually lead to the communist dream of a classless society.

Returning to our case, big industrial projects operated as a symbol of the victory and centrality of the working class in communism. Moreover, heavy industry was the signifier of the leading role of the industrial worker in the communist economy. The centrality of the industrial worker was complementary to the cult of technology. The planning of big industrial units also put in a central position the specialised group of engineers and technicians. Contrary to the official ideology of social equality, they constituted a 'privileged class of planners and managers' (Crowther 1988, p. 10), situated within the working class, but at the same time invested with distinct powers. Both elements were highly visible in the case of Iron Gates, accounting for the central role of the engineers in the building of socialism (Josephson 2002).

Summing up, the use of hydropower was embedded in the political system of the socialist states. Far from being limited to the Cold War period, the tensions and subsequent regulations of natural resources remain a core dimension of the current global political economy and point to the general issue of nature-society interactions: 'the various ways in which nature is produced and consumed in primary commodity industries, new strategies and relations of resource production and consumption, emerging forms and styles of governance, the reregulation of nature and resource extraction, and political struggles around resource and environmental issues' (Bridge & Jonas 2002, p. 760).

THE INAUGURAL DISCOURSES

The building of the Iron Gates complex occupies a special place in the context of Romania's international relations within the communist bloc. Specifically, it marked a shift in the political relations with Yugoslavia and the beginning of co-operation with Tito's regime. This was made possible by the new context of openness in the Soviet bloc towards non-aligned countries. In this context, the inauguration of Iron Gates was a highly significant political event. It was attended by the two heads of states, Ceaușescu and Tito, and by numerous high-ranking communist officials from Romania, Yugoslavia, Bulgaria, Hungary, Czechoslovakia, and the USSR, as well as foreign officials from Austria and other non-communist states.

Examining the inaugural discourses of the two presidents, we find several key signifiers which define the political dimension of the project. The two communist leaders presented the project as the outcome of a 'friendship of the two peoples' and as an example of self-reliant and autonomous development. An interesting aspect in the discourses of the leaders is the downplaying of the rich history of international participation in the planning of Iron Gates and the complex regional interests in controlling the river. Notable is the absence of any mention of USSR involvement in the management of the Danube River. The almost exclusive focus on the results of the bilateral relations minimised the previous international and regional contributions and was aimed at underlining a claim of autonomy within the Soviet bloc. In the case of Ceaușescu's discourse, this was in sharp contrast with the closer relations with the USSR maintained by his predecessor, Gheorghiu Dej.

One recurring element in the inaugural discourses is the articulation of the Iron Gates with socialism and its development vision. Ceaușescu refers to the importance of the project as a moment in the 'world battle for socialism, democracy and social progress', while Tito takes the opportunity to remind the audience about the non-aligned

status and the specificity of the Yugoslav model of socialism, a 'socialist self-governing society' and a 'non-aligned socialist country' (Scînteia 1972, p. 2). The project is also considered especially relevant in the context of the relations between the two communist parties. Ceaușescu mentions the successful relations between the Romanian Communist Party and the Communist Union from Yugoslavia, based on 'respect and mutual esteem, on Marxist-Leninist principles and on proletarian internationalism' (Scînteia 1972, p. 2).

The second recurring element in their inaugural discourses stresses the political and economic co-operation between the two states. Ceaușescu considers the project to be a true 'historical moment', a 'model of international co-operation between peoples building the socialist order' (Scînteia 1972, pp. 1–2), while Tito insists that the project could be offered as a model of co-operation for other states. Moreover, this example of co-operation is seen as a positive moment occurring in an international context marked by numerous conflicts. Both presidents refer to the Vietnam War and to the sensitive situation in the Middle East. They take the opportunity to speak about the need to transform the international order towards a peaceful relation among independent and sovereign states, about the need to end international conflicts and about 'the common fight against imperialism'. Ceaușescu saw the project as an 'expression of the superiority of new relations among peoples, based on respecting the national independence and sovereignty and the non-interference in the internal affairs, in mutual advantage' of all (Scînteia 1972, pp. 1–2).

Such 'anti-imperialist' positions *vis-à-vis* the Western world were frequently coupled with the idea of autonomous economic development. Despite the close technical and political co-operation, an implicit reference to the hegemony of the USSR could have been perceived in the rhetoric of the two leaders. The extent of political autonomy claims made by Yugoslavia and Romania remains an open question in the historiography of communism (Crump 2015). Similarly, Ceaușescu's perceived vision of an autarchic model of development is put under scrutiny

(Verdery 1991; Murgescu 2010). The actual autonomy was rather limited in relation to the construction of the Iron Gates, being present, for instance, in the efforts to fund the construction of the Iron Gates through domestic resources, without accessing foreign loans. However, the appeal of the two heads of state to engage in a bilateral initiative relatively independent of the direct control of the Soviet and Western powers had a significant ideological function for both leaders, as revealed in the inaugural discourses.

It is significant that both presidents refer in the first instance to the symbolic value of the project for socialism and for the international order. Tito's discourse is rather brief, paying homage to the victims of the dam construction and including references to the technical details and economic benefits of the project. Tito insists more on the economic benefits of the project. There is also a mention of the principle of the 'equal rights of all peoples', pointing to the idea of the Yugoslav autonomy as a 'self-governing socialist society' and a 'non-aligned socialist country' (Scînteia 1972, p. 2). As we have already mentioned, the autonomy referred to in the discourses downplays the intense technical and political co-operation with the USSR and with other socialist states from the communist bloc. It is therefore important to mention that both leaders express their gratitude to the USSR for its support in the construction of the Iron Gates. On the other hand, it should be stressed that technology in general was significantly involved in postwar global politics, proving 'how Western and Soviet technoscientific projects shaped Cold War politics and culture' (Hecht 2011, p. 1).

Not least, it is interesting that both discourses bring a specific techno-political vision of hydropower. Ceaușescu speaks about how 'taming the Danube's waters and the transformation of their power into energy and electricity represents a wonderful proof of mankind's creative capacity, of the huge resources available in the socialist society' and about the grandeur of the 'epoch of great world techno-scientific revolution' (Scînteia 1972, p. 2). In turn, Tito mentions how 'taming the force of the Danube and putting it into the service of mankind was

not an easy task', the new hydropower ensemble being a 'giant' which 'even the most developed countries can be proud of' (Scînteia 1972, p. 2).

The two discourses illustrate how the development pattern followed by the communist regime was indeed heavily based on the intensive exploitation of all natural resources for economic growth. The two leaders insisted on the intrinsic function of modernisation brought by the new hydropower system to the economies of both states and highlighted the transformative role of such joint projects for the international co-operation of socialist states. The inaugural discourses display a vision of modernisation specific to the socialist regimes of that period. As Scott (1998) makes clear, high modernism is coupled with authoritarian politics, as was especially evident in the case of Lenin's industrial development vision. And we could add, while Lenin was a true 'engineer of Revolution', the two socialist leaders could be seen as engineers of the 'self-governing socialist societies' (Scott 1998, p. 95).

The ideological use of hydropower by political leaders is not limited to totalitarian regimes or dictatorships, but has a deeper relevance as general political signifiers. In addition, authoritarian leaders have used hydropower in connection to an encompassing 'cult of personality'. In the communist context, hydropower development was instrumental for political leaders in legitimising their power through an appeal to technological progress and economic prosperity, being involved in consolidating the core principles of the new political order and in signifying specific features of communist regimes.

Hydropower projects were deeply connected to the political and ideological dimension of the new communist regime. Hydropower and water resources were an essential element not just in the industrial development of Romania, but also in the political construction of communism, specifically in the 'programme for building "the multilaterally developed socialist society"' (Turnock 1979, p. 609). On the one hand, they made possible the promised 'industrial dream', by producing electricity and by reproducing the industrialisation model of the USSR. On the other hand, hydropower plants

were signifiers of communist power, being presented as a victory of 'the people' and of their communist leaders against imperialism and the former bourgeois regime (Scînteia 1972).

CONCLUSIONS

Current research in political economy and political ecology stresses that technological transformations of nature are concomitantly connected to economic and political imperatives. Hydro-technological development is of particular interest from a techno-political perspective (McCully 2001; Josephson 2002; Pritchard 2011). The building of large dams and hydropower plants is currently among the most controversial of development projects, with public opposition to the construction of new dams rising quickly (McCully 2001). But during communism, as well as during post-war capitalism, hydropower was seen as a core component of economic development and technological progress. The communist experience shows a specific connection of industrial development in general, and of hydropower projects in particular, with centralised economic planning, social policies and distinct ideological priorities. These priorities involve a more central and complex role of political leadership than in Western societies.

The Iron Gates case discussed in this paper is among the most representative hydropower projects when examining the economic and political relations underpinning industrial development in communist Romania and Yugoslavia. It reveals the central contribution of political power and complex institutional settings in hydropower development. In examining the political dimension involved in the development of hydropower we conclude that the communist regime produced a specific techno-political framework for the transformation of the 'hydraulic landscape' (Swyngedouw 2007). This was embedded in the communist policies of industrialisation and in the drive for rapid economic development. The regime planned a rapid urbanisation process and the 'modernisation' of society, including the development of an urban class and the reduction

of economic disparities between regions (Turnock 1970; Kornai 1992).

The construction of hydropower systems in communism was part of a comprehensive electrification and urbanisation master plan (Scott 1998). Hydropower construction in communist Romania deeply transformed social and economic relations through the intervention of political power. This new 'hydraulic landscape' was a typical product of the communist official ideology, but at the same time embodied a more general development model based on the modernisation strategy of industrialisation and urbanisation. Iron Gates points to important elements related to the landscape of hydropower, specifically to the political contribution of the communist authorities to industrial development and the imprinting of this development with specific ideological articulations and social imperatives.

The construction of the Iron Gates also reveals a particular institutional setting in which two socialist states have co-operated and produced a shift in the international relations within the Communist bloc. It marked a new era in technological and political co-operation among the states within the communist bloc and with Western countries. Moreover, Iron Gates was presented by the communist authorities as a true symbol of socialism, with its focus on technological progress, industrialisation, and on the ideological principle of the 'development for the people'. The Iron Gates is highly significant for understanding the fusion of industrial development, social policies, international relations and, not least, of ideology and political discourses in the construction of hydropower systems in the communist space.

REFERENCES

- ACT FINAL (1964), Act Final din 30 Noiembrie Privind Realizarea Sistemului Hidroenergetic si de Navigatie Portile de Fier, pe Fluvial Dunarea. *Buletinul Oficial al R S Romania no 36/3 July 1964* (Consiliul de Ministri, Bucharest)
- ANUARUL STATISTIC AL REPUBLICII SOCIALISTE ROMÂNIA (1971), *Producția Energetică a RSR*

- [*Energy Production of Romania*]. București: Direcția Generală de Statistică
- ANUARUL STATISTIC AL REPUBLICII SOCIALISTE ROMÂNIA (1973) *Producția Energetică a RSR* [*Energy production of Romania*], București: Direcția Generală de Statistică
- BOCKMAN, J. (2012), The Long Road to 1989. Neo-classical Economics, Alternative Socialisms, and the Advent of Neoliberalism. *Radical History Review* 112, pp. 9–42
- BRIDGE, G. & A.E.G. JONAS (2002), Guest Editorial – Governing Nature: the Reregulation of Resource Access, Production, and Consumption. Governance, Institutions, and Resource Extraction. *Environment and Planning A* 34, pp. 759–766
- CATTELL, D.T. (1960), The Politics of the Danube Commission under Soviet Control. *American Slavic and East European Review* 19, pp. 380–394
- CONVENȚIA DE DECONTARE (1963) Convenția între Guvernul Republicii Populare Române și Guvernul Republicii Socialiste Federative Iugoslavia Privind Stabilirea Valorii Investițiilor și Decontarea Reciprocă în Legătură cu Realizarea Sistemului Hidroenergetic și de Navigație Porțile de Fier, pe Fluviul Dunărea din 30.11.1963.
- CROWTHER, W.E., (1988), *The Political Economy of Romanian Socialism*. New York: Praeger
- CRUMP, L., (2015). The Warsaw Pact Reconsidered. International relations in Eastern Europe: 1955–69. London: Routledge.
- DECRET [STATE DECREE] NR 137 (1964) Decret Pentru Ratificarea Acordului între Republica Populară Română și Republica Socialistă Federativă Iugoslavia, Privind Realizarea și Exploatarea Sistemului Hidroenergetic și de Navigație Porțile de Fier, pe Fluviul Dunărea.
- DEMERRIT, D., (2005). Science, Social Constructivism and Nature. In: B. BRAUN & N. CASTREE, eds., *Remaking Reality: Nature at the Millennium*, pp. 172–192. London: Routledge.
- HECHT, G., (2011), Introduction. In: G. HECHT, ed., *Entangled Geographies: Empire and Technopolitics in the Global Cold War*, pp. 1–12. Cambridge, MA: The MIT Press.
- HEMING, L., P. WALEY & P. REES (2001), Reservoir Resettlement in China: Past Experience and the Three Gorges Dam. *The Geographical Journal* 167, pp. 196–212
- JOSEPHSON, P. R. (2002), *Industrialized Nature: Brute Force Technology and the Transformation of the Natural World*. Washington, DC: Island Press.
- KORNAL, J. (1992), *The Socialist System. The Political Economy of Communism*. Princeton, NJ: Princeton University Press
- LAGENDIJK, V. (2014), Divided Development: Post-war Ideas on River Utilisation and their Influence on the Development of the Danube. *The International History Review* 36, pp. 1–19
- LEGEA NR. 10 (1971) Pentru Adoptarea Planului Cincinal de Dezvoltare Economico-socială a Republicii Socialiste România pe Perioada 1971–1975, din 21/10/1971.
- LINNERROOTH-BAYER, J. & S. MURCOTT (1997), The Danube River Basin: International Co-operation on Sustainable Development. *Natural Resources Journal* 36, pp. 631–657
- MADDISON, A. (2003), *The World Economy. Historical Statistics*. New York: OECD.
- MCCULLY, P. (2001), *Silenced Rivers: the Ecology and Politics of Large Dams*. London: Zed Books
- MITCHELL, T. (2002), *Rule of Experts: Egypt, Techno-Politics, Modernity*. Berkeley, CA: The University of California Press
- MURGESCU, B. (2010), *România și Europa. Acumularea Decalajelor Economice (1500–2010)* [*Romania and Europe. Accumulation of Economic Gaps (1500–2010)*]. Iasi: Polirom
- POP, G.P. (1996), *România. Geografie Hidroenergetică* [*Romania. Hydroenergetic Geography*]. Cluj-Napoca: Presa Universitară Clujeană
- PRITCHARD, S. (2011), *Confluence: The Nature of Technology and the Remaking of the Rhône*. Cambridge, MA: Harvard University Press.
- REGISTRUL ROMÂN AL MARILOR BARAJE [ROMANIAN REGISTER OF LARGE DAMS] (2013), Baraje din Romania [Dams in Romania]. Available at <<http://www.baraje.ro/>>. Accessed 21 June 2014.
- SCÎNTEIA (1972), Inaugurarea Hidrocentralei Porțile de Fier, anul 41, nr. 9150, 17 Mai [Iron Gates hydroelectric inauguration, year 41, no. 9150 May 17]. Bucharest.
- SCOTT, J. C. (1998), *Seeing like a State: How Certain Schemes to Improve the Human Condition Have Failed*. New Haven, CT: Yale University Press.
- SMITH, N. (1990), *Uneven Development. Nature, Capital and the Production of Space*. London: Blackwell
- SWYNGEDOUW, E. (2007), Technonatural Revolutions: the Scalar Politics of Franco's Hydro-social Dream for Spain 1939–1975. *Transactions of the Institute of British Geographers* 32, pp. 9–28.
- TURNOCK, D. (1970), The Pattern of Industrialization in Romania. *Annals of the Association of American Geographers* 60, pp. 540–559

- TURNOCK, D. (1979), Water Resource Management Problems in Romania. *GeoJournal* 3, pp. 609–622
- US EIA (US ENERGY INFORMATION ADMINISTRATION) (2014), International Energy Statistics – Romania. Available at <<http://www.eia.gov/cfapps/ipdbproject/iedindex3.cfm?tid=2&pid=2&aid=12&cid=r3,&syid=1980&eyid=1989&unit=BKWH>>. Accessed 15 June 2014.
- VERDERY, K. (1991), *National Ideology under Socialism: Identity and Cultural Politics in Ceaușescu's Romania*. Berkeley, CA: University of California Press.
- VERDERY, K. (1996), *What was Socialism, and What Comes Next?* Princeton, NJ: Princeton University Press.
- VESALON, L. & R. CREȚAN (2013a), Mono-industrialism and the Struggle for Alternative Development: The Case of the Roșia Montană Gold-mining Project. *Tijdschrift voor Economische en Sociale Geografie* 104, pp. 539–555.
- VESALON, L. & R. CREȚAN (2013b), 'Cyanide Kills!': Environmental Movements and the Construction of Environmental Risk at Rosia Montana. *Area* 45, pp. 442–451.
- WHITE, R. 1995, *The Organic machine: The Remaking of Columbia River*. New York: Hill and Wang.
- WOODWARD, S.L. (1995) *Socialist Unemployment: The Political Economy of Yugoslavia 1945–1990*. Princeton, NJ: Princeton University Press