

## Article

# Post-Coal Fantasies: An Actor-Network Theory-Inspired Critique of Post-Coal Development Strategies in the Jiu Valley, Romania

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**Abstract:** Romania is among the countries with a long history of coal mining, which intensified in the context of the industrialization and urbanization policies during the socialist period. During the post-socialist transition, mining units decreased considerably, with those considered economically unprofitable being restructured and eventually closed. This process, which began in the late 1990s, continues today with the increasing discussions about the transition from coal in Romania, the commitment to reduce greenhouse gas emissions, and the signing of the Paris Agreement, which stipulates the abandonment of coal by 2030. The Jiu Valley region is Romania's most important mono-industrial area that developed exclusively around coal extraction. This article proposes an analysis of the social impact of reducing mining activity in this area based on actor-network theory. Recently, the discussions on the "Just Transition" in the Jiu Valley have culminated with the "Jiu Valley Economic, Social, and Environmental Development Strategy" (2021–2030) and the related Action Plan. This paper seeks to address the question: how were people "brought in" for the production of coal during socialism, how were they subsequently "pushed out", and how challenging is it now for the Jiu Valley strategy to reassemble a network to support the post-coal transition? Our analysis helps to understand, in an innovative way, the challenges of the Jiu Valley Strategy as a mismatch between a creative and entrepreneurial city model on the one hand and the ruralized/small urban (former mono-industrial) conditions prevailing in the Jiu Valley on the other. We thus provide a critical analysis of the strategy as one that is conceptually wedded to the large urban center model and applies the just transition framework in a decontextualized way. We emphasize the role of the dismantling of coal production in the narrowing of the space of possibilities of change brought about by the just transition. Using the published literature on the Jiu Valley, we also show what broader lessons can be drawn from this case for similar transition processes in Central and Eastern Europe.

**Keywords:** actor-network theory; just transition; development strategy; monoindustrial urban area; Jiu Valley



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## 1. Introduction

The transition away from coal has been the focus of much research and policy discussions, most of them based on the just transition framework [1–8]. Our contribution aims to add to the critical reading of the just transition. First, we follow Brown and Spiegel [9] in recognizing "the complex entanglements of coal within a wider political economy and the symbolic effects it produces in particular places" (p. 151). This means that the starting point of the post-coal transition is not a clean slate but rather a complicated process quite different from the previous era of coal production. On the other hand, decarbonization is itself a challenge, being intrinsically entangled in economics, politics, geography, culture, and knowledge [10]. Our work seeks to bridge the two dominant foci of the current literature—the one that emphasizes the continued but problematic relevance of coal and

the other that highlights the challenges of post-coal development—by looking at the *coal-to-post-coal* transition. This allows a better understanding of the “big picture” of the before and after of the coal transition in a particular coal mining area that is the Jiu Valley in Romania. To this end, we use actor-network theory (or ANT, for short). We use ANT in the version inspired by Michel Callon and John Law [11–14]. Our aim is to show what development has meant during the time of intense coal production (up until 1990), how the closure of the mines has dismantled economic life in the Jiu Valley beginning in the late 1990s, and the challenges that the new Jiu Valley post-coal strategy (2021–2030) is likely to face. We identify these three periods as stage I, stage II, and stage III, respectively.

The history of the Jiu Valley, especially its dramatic turn after 1990, illustrates how “the end of the Cold War launched one of the most brutal economic phases of the modern era” [15] (p. 18). This brutal dismantling of manufacturing is massively exemplified by the contraction of the local economy in the Jiu Valley. Saskia Sassen uses the term expulsions to describe the “move from Keynesianism to the global era of privatizations, deregulation, and open borders for some, [which] entailed a switch from dynamics that brought people into dynamics that push people out” [15] (p. 211). The goal of the paper is to explain how people “were brought in” for the intensified production of coal, how they were subsequently “pushed out”, and how challenging it is now for the Jiu Valley strategy to reassemble what has been shattered. We trace and explain these processes in terms of the making and unmaking of actor networks based on secondary sources of data and on the available literature.

In short, we argue that the first stage in the development of the Jiu Valley saw a tightly integrated network in which the production of “more coal for the fatherland” [16] (p. 298) played a central role. This network was unraveled when the mines were deemed “unprofitable” or “loss-making” [17]. Unravel means here that the central goal of coal production was progressively reduced (from 66 million tons in 1989 to 1 million in 2021) [18], and the different participants in the network coalesced around new, micro-level networks. This process has taken shape since 1997 and has rendered a regional development network—similar to the one during socialism—increasingly unattainable. From this point of view, the proposed Jiu Valley strategy (henceforth *JVS*) attempts to reassemble a new single network around a post-coal translation of development. Based on actor-network theory, we provide a critique of the *JVS* [19] by showing that it problematically tries to straddle the fragmented networks left in the wake of the collapse of coal production and an untried model of creative urban development fostering a just transition. The *JVS* is located at the intersection of several discursive formations, such as the just transition literature [3,20] but also the creative city [21,22] and the entrepreneurial city [23].

The paper continues with an outline of the theoretical framework based on actor-network theory and tailored to the analysis of the coal/post-coal transition. It then discusses the methodology and describes the case before delving into the results and their interpretation. The latter section is structured into three parts, dealing with the coal-production actor network of the planned economy (until 1990), the contemporary hiatus in development (1997–present), and the future envisioned by the *JVS*. The concluding remarks are provided in the last section of the paper.

## 2. Theoretical Background: Stages of Actor (Mis)Alignment

This paper relies on a broad conceptual framework inspired by actor-network theory or ANT [12,13,24] to make sense of the development path of the Jiu Valley. This path is divided into three periods, namely socialism, after socialism, and under the current development scenario proposed by the Jiu Valley (post-coal) strategy.

We have chosen the ANT framework given its wide applicability [25] and, in particular, for the attention it pays to the idea of translation. First, translation means placing in specific relationships “heterogeneous entities” to constitute an actor-world by assigning, to each entity, “an identity, interests, a role to play, a course of action to follow, and projects to carry out” [12] (see also [14] for an application to mining). The entities can be social actors,

institutions, symbols, but also material objects and infrastructures. The coal-producing region known as the Jiu Valley can thus be seen as a techno-economic network, which is “a coordinated set of heterogeneous actors which interact more or less successfully to develop, produce, distribute and diffuse methods for generating goods and services” [24] (p. 133). The principal good produced by the Jiu Valley techno-economic network has been, over the last 160 years, mostly pit coal (in Romanian, *hUILĂ*). To achieve production, and a given level of production at that, coal deposits, extraction technologies, miners and engineers, roads, and towns had to be brought into specific relationships around the goal of producing coal. This was no easy feat, as the translation was achieved through “creating convergences and homologies by relating things that were previously different” [26] (p. 211). The translation is thus a process of ordering and controlling others, but it is always prone to disruption [14]. To understand what this ordering entails and how it can fail, ANT describes four moments of translation: problematization, interestment, enrolment, and mobilization [11]. Outlining these moments is important in order to explain how development—as a conscious strategy of social actors—is enabled or disabled by various network arrangements.

Problematization occurs when a set of initiating actors, such as politicians and technocrats, define a problem that interests a broader collective. Such a problem may be the need to develop the heavy industry in a largely agrarian economy. In the case under discussion, the problem emerged historically in post-war Romania. Boosting the centers of steel production in this country required the securing of raw materials, especially coal [27]. Over time, a network was established in which the coal mines played an increasingly important, albeit secondary, role in the establishment of the heavy industry as a central goal of economic development. In ANT language, the mines were assigned distinct identities and were attributed specific roles to support the maximization of coal production. As coal became indispensable for industrialization, coal production turned into what ANT-inspired authors call an “obligatory passage point”, that is, a “strategic point through which the actor world must pass” [12] (p. 27). Economic and social life became organized around coal production, and its different elements (the mining workforce, the technologies of extraction, the administrative resources, etc.) had to be “persuaded to identify with the network” [28] (p. 361). Despite the mild language, bringing in line different actors of the kind mentioned above always involves a power struggle. “Alliances are normally inequitable [ . . . ], with partners relying to different degrees on their relationship” [14] (p. 810).

Getting actors to agree to become jointly involved in intensified coal production is only one side of the task of mine developers. The other side is revealed when testing whether the involvement has actually taken place. This is the second moment of establishing the actor network, that of interestment, which refers to “the group of actions by which an entity [the coal producers] attempts to impose and stabilize the other actors it defines through its problematization” [11] (pp. 207–208). Interestment means interposing effective barriers between the actors enticed to participate in the network and other entities that might lay similar claims on them. Interestment devices can be different intermediaries, such as pieces of law, financial incentives, infrastructures, or money [24], that are meant to dissociate the actors from alternative problematizations. Interestment can take the form of providing incentives for mine workers (such as high salaries and subsidized housing) to decrease the appeal of alternative economies (such as agriculture).

As the third moment of the actor network, enrolment is about defining and coordinating the roles in the network once these have been accepted. “To describe enrolment”, Callon states, “is to describe the group of multilateral negotiations, trials of strength, and tricks that accompany the interestment and enable them to succeed” [12] (p. 211). Applied to the production of coal, the different actors need to work together to maximize the production of this raw material. Negotiations are needed because the actors who have been drawn into coal production have given up alternative networks and so need to reach a *modus vivendi* [12] (p. 213) with the developers and others. Trials of strength are required because actors do not remain in the network by mere inertia but have to be actively kept

in. Evidence for this is the history of coal miners' strikes and of their sometimes-brutal suppression, both worldwide and in the case under discussion (as illustrated in Section 4.1).

Finally, mobilization is about setting the actors into motion. Achieving the top production of coal requires the displacement of different actors and their transfer in the space of the mine into mono-industrial towns. It requires a set of complex transformations whereby actors' capacities and needs are adjusted—via specific institutions such as “work battalions”—to the requirements of intensified coal production. Mobilization is important because from the mass of dispersed and relatively inaccessible entities, from this amorphous configuration of actors, the developers need to subordinate everything to the unique goal of the mine.

However, mobilization is by necessity restricted: not all actors' needs and expectations are allowed into the translation. For this reason, it is necessary to establish representatives or spokespersons who use chains of intermediaries going back from the mass of miners and their families to their representatives. If the spokespersons are representative, production can continue unabated. The way the production of coal is organized validates its goal of making the towns truly mono-industrial. This is the last moment of the translation. Callon summarizes all that has happened during this process as follows: “The initial problematization defined a series of negotiable hypotheses on identity, relationships, and goals of the different actors. Now at the end of the four moments described, a constraining network of relationships [an actor network] has been built” [12] (p. 218).

We use ANT to show how, over the course of its industrial history, the Jiu Valley has been constructed in such a way as to translate one of the main goals of socialist Romania, which is heavy industrial development. With the end of the planned economy, this translation has been unraveled in such a way that each of the actors that have previously formed the network has been “lured” [11] (p. 211) to partake in alternative translations away from coal but certainly not beyond coal. In light of these arguments, actor-network theory helps outline a critique of the *JVS* for its failure to provide evidence for how an alternative—post-coal—translation of development can be achieved.

The critique is articulated around the following critical moments of the translation. First, the *JVS* offers a problematization but does not posit a credible obligatory passage point for the post-coal development of the Jiu Valley. This problematization is made in terms of the creative city [21] or the entrepreneurial city [23], which rely on entirely different network configurations than those available in the Jiu Valley. Second, interestment devices are not specified, and moreover, they seem to work in the opposite direction to the way they are supposed to in the *JVS*. The proliferation of smaller actor networks that emerged in the wake and as partial replacements for the collapse of the grand actor network of coal production undermines the idea of a common development strategy for the Jiu Valley. Third, it might be argued, but only hypothetically at this point, that the *JVS* is itself part of the process of selectively developing fragments of the Jiu Valley rather than the region in its entirety. Enrolment and mobilization tend to favor a centrifugal movement rather than the centripetal configuration that would be consistent with a region-wide development.

The processes described are certainly cross-scalar, as they involve the national and the local levels. The actor-network theory was consciously fashioned as a theoretical bridge between the micro- and the macro-social, the local and the national, and the large and the small [29]. The main advantage is that it does not isolate local actions and decisions as explanatory factors but places the weight of the explanation on the articulation of cross-scalar factors. What may appear as problematic or inadequate planning, for example, is the result of a more or less successful translation, which is itself a struggle between unequally powerful actors.

### 3. Methodology and Case Description

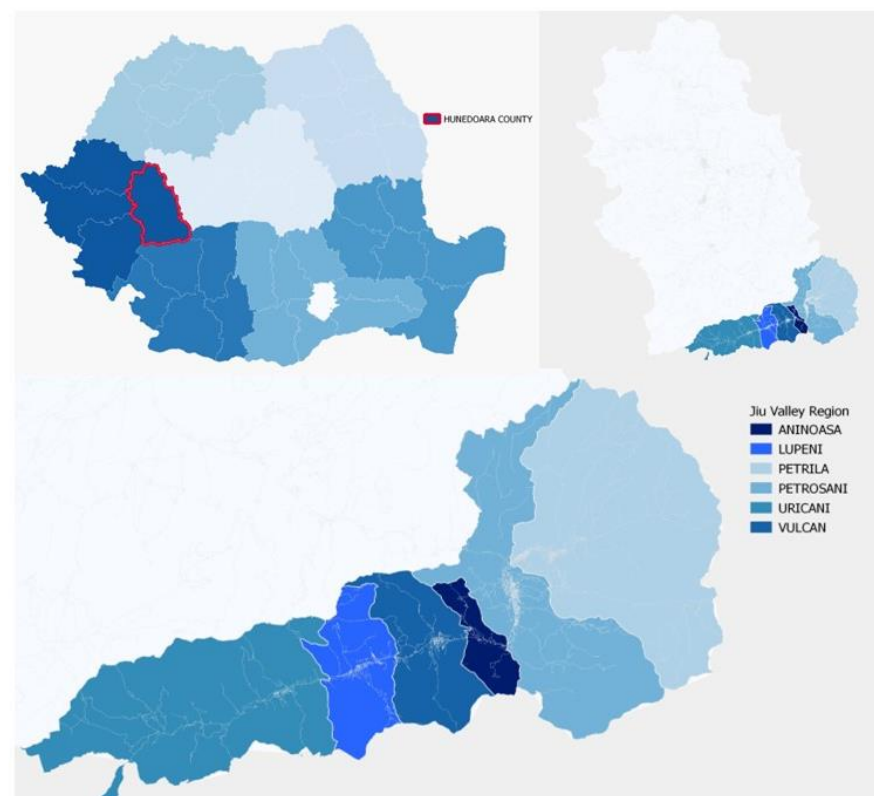
The present analysis focuses on the six towns in the Jiu Valley, which are integrated into an urban network historically developed around mining activity. They are located in Hunedoara county in the development region RO42 West, Macroregion four and include

the towns of Petroșani, Petrila, Vulcan, Aninoasa, Lupeni, and Uricani, with approximately 130,000 inhabitants in 2021 (see Table 1 and Figure 1, INS Tempo, indicator POP107D).

**Table 1.** The distribution of the population from the Jiu Valley (2021).

City	Population	% of Jiu Valey Total
Petroșani	40,319	31%
Vulcan	27,274	21%
Lupeni	25,375	19%
Petrila	23,627	18%
Uricani	9196	7%
Aninoasa	4458	3%

Source: National Institute of Statistics of Romania.



**Figure 1.** Geographical location of the study area in Romania and the Hunedoara County. Source: <https://data.gov.ro/> (accessed on 10 May 2022).

The history of coal mining in the Jiu Valley dates back to the period of the Austro-Hungarian Empire, with the first surface mining starting in 1840 in Vulcan, Petrila, and Petrosani [30]. In the late 1800s and early 1900s, new mines were opened in Uricani and Lupeni. At the beginning of the socialist period, the communist government nationalized all the mines. The mining sector underwent significant development in terms of increased production and the number of employees in the context of rapid industrialization.

After the 1989 Revolution, there was a period of stagnation until 1996–1997, when production collapsed in the context of neoliberal restructuring policies and the start of collective lay-offs. In fact, between 1996 and 1999, the number of employees fell by about 2.2 times, and coal production halved [31]. The decline has continued until the present. In 2010, nearly 2 million tons of coal were daily extracted; in 2015, approximately 1.6 million [31], while in 2022, about one million tons [32].

In 1991, the restructuring of the mining industry began, reducing the number of people working in mining from around 50,000 to 4000 today. Thus, compared to 1990,



more than 90% of workers either lost their jobs or retired (many of them early), while opportunities for re-employment were limited and marginal [33]. An initial shock occurred in the late 1990s when the Romanian Government, following the recommendation of the World Bank, launched a restructuring and mine closing program. Between 1997 and 1999, the Government paid compensatory wages for about 20% of the total workforce in the Jiu Valley, thus rendering them, in effect, redundant. Although discursively, compensatory wages were intended to encourage entrepreneurial initiatives, in practice, the aim was to encourage workers to accept the termination of the employment contract [34,35]. After 2000, there was a quasi-total reduction in mining activity, and policies aimed at ensuring the area's redevelopment were far from having the desired effect [35].

Following the decision 787/2010 of the Council of the European Union on state aid to facilitate the closure of uncompetitive coal mines, the *National Society for the Closure of Jiu Valley Mines* (SNIMVJ) was established in 2012. Since then, three out of the last seven mines have been closed. According to the *JVS*, only four out of fifteen mines in 1990 are currently active, and they are set to be closed in the following years. Funding for redevelopment is available in principle, as the Jiu Valley is part of the Just Transition Platform, a network of twenty coal regions that aim to diversify their economic activities and offer residents viable economic alternatives to mining.

In this context, the Romanian Government approved the Jiu Valley Economic, Social, and Environmental Development Strategy for 2022–2030 [19]. The *JVS* is the primary focus of our analysis, which assesses the viability of the proposed development model given the area's historical context. The analysis of the Jiu Valley area has been the subject of numerous case studies aimed at analyzing the impact of post-socialist transition policies on mono-industrial towns. To critically assess the *JVS*, we use secondary literature and data to provide an understanding of the historical context. We describe the development rationale and the network alignment during the planned economy and the subsequent violent misalignments after the Romanian revolution of 1989.

We structured our analysis in three historical stages. In the first stage, we discuss the development project around mining activity in the socialist era using historical literature and data. In the second stage, we analyze the economic and social transformations that took place in the region following the transition from a centrally planned to a market economy. We use secondary data from sociological and anthropological studies conducted in the last 20 years and official data. The aim is to provide a general understanding of the social impact in the region using quantitative and qualitative data from these studies, benefiting from the relatively large number of academic or policy publications on the cities of the Jiu Valley. In the third stage, we conducted a thematic analysis [36] of the main pillars around which the *JVS* was designed. In terms of textual data selection, we followed the main structure of the text (*JVS*). Thereby, we went from the analysis of the main themes of the *JVS*, which are the four pillars on which the strategy is based, to more specific topics and word searches. To further refine our analysis, we also looked at the occurrence of key terms which are part of a recognizable discourse dealing with the creative city [21,22].

## 4. Results and Discussion

### 4.1. Network Alignment during the Planned Economy

In the context of a predominantly agrarian country at the beginning of the post-war period, Romania's economic development during the socialist period was premised on the policy of rapid industrialization and urban development. The post-war socialist elites prioritized heavy industry [37]. Studies such as those of Vladimir Pasti [38] illustrate that the development of a socialist society was translated by means of three major economic and social macro units, or *complexe*: rural, socio-industrial, and political-administrative, which aimed to achieve sets of coherent networks within the planned economy. Most of the working population was divided between the first two networks, which will be discussed in the paragraphs below. Both networks functioned as rival translations of development

throughout socialism. Rival is meant here as organized as mutually exclusive networks from the point of view of employment and associated infrastructures.

The rural *complex* was organized during the socialist period around industrially operated farms, either in state farms (IAS) or cooperatives of agricultural production (CAP). The modernization of agriculture took place through a long-term cooperativization program from 1949 to 1962, a policy considered almost inevitable in the context of agricultural underproduction, overpopulation, and the lack of mechanization [39]. This political decision was the answer to the problem of fragmentation of agricultural property. According to the 1948 census, 91% of agricultural land was less than 5 hectares and 36% less than 1 hectare, making it impossible to practice modern agriculture [40]. The organization of agricultural production into state farms and cooperatives transitioned to more mechanized agriculture, which reduced the population employed in agriculture, which either moved to urban centers [41] or became commuters to nearby cities to work in the industry. Ivan Szelenyi called this process under-urbanization, arguing that the growth of the urban population in socialist countries was slower than the growth of the industrial proletariat [42].

Socialist industry was the main socio-economic *complex* around which the socialist society was built. Industry provided the industrial worker with social status and the community with essential public services such as education, health, housing, urban administration, culture, and sport [38,43]. In other words, under state socialism, the industry's role was not merely that of producing goods and selling them for profit but as a unit of production with social functions, functioning as the obligatory passage point of the socialist society [43]. At the same time, the state-planned economy and the policy of full employment provided a secure position for the workers. Managers of state-owned enterprises often faced unrealistic targets set by the central authorities in terms of the availability of raw materials and labor or the functioning of the means of production. To achieve the strict requirements of the five-year plan, one of the tactics was to hoard labor and raw materials for when they needed to increase production, indirectly contributing to the policy of guaranteed employment [43].

A particular case of urban communities, called mono-industrial towns or areas, have been established around a dominant industry. While in 1930, there was only one mono-industrial city in Romania, by the end of the socialist era, 43 towns had at least 50% of their population engaged in the same industrial activity [44]. After 1968, localities classified as fulfilling industrial, mining or tourism functions were given city status [45]. As in the case of other former socialist states, "company towns" [46] emerged around factories or mining areas. These towns developed in the context of rapid industrialization in areas where natural resources were available. Their size was under 50,000 inhabitants, and they were often located in areas relatively far from large urban centers [47]. The six localities covered in this study were developed around the mining industry in the Jiu Valley and represent a typical case of company towns. Urbanization in the context of rapid industrialization in the area has mainly meant the construction of new housing blocks and, to a lesser extent, other social facilities specific to urban areas. At the same time, housing conditions are considered worse in the Jiu Valley compared to the national average, with many poorly designed and rapidly built housing, comfort 2 and 3 (for example, in the town of Aninoasa, 50% of the dwellings have shared bathrooms) [44]. Nevertheless, from the mid-1960s until the late 1980s, coal mining experienced rapid growth and was considered essential for sustaining the heavy industry. Working in mining during this period was the primary source of wealth and prestige for workers [48]. Around mining, the state crafted a network of facilities, including housing, access to education, health, culture, sport, and leisure.

In parallel with the development of mining, educational institutions have been established with the aim of providing a skilled workforce in mining [31]. The first higher education institution, the Coal Institute of Petroșani, founded in 1948 (later renamed the Mining Institute of Petroșani), was the leading university-level institution at the national level, training professionals for the mining sector. At the same time, research institutes such as the Institute for Research and Mining Design and the National Institute for Research

and Development in Mine Safety and Protection to Explosion were established. Last but not least, vocational schools and high schools have been developed to train a qualified workforce. In fact, by the 1980s, investment in primary and vocational educational infrastructure in Romania had been significant, with the educational system being considered a fundamental element of the planned economy, having the function of preparing the workforce for entry into production [49]. All these institutions tied the educational system in the Jiu Valley to the actor-network of coal production, and their strength was given by the high degree of enrollment into the latter network.

In theoretical terms, the coal industry in the Jiu Valley functioned as an obligatory passage point (OPP) for the local economy, being intimately linked to the national-level OPP represented by the heavy industry [27]. This was tightened even further by the five-year plan. The socialist-era problematization of the Jiu Valley as a coal-producing area was highly successful due to the number and efficiency of interestment devices used by the socialist authorities. These included high salaries for the miners and the provision of public goods, all of which amounted to a strong economic and cultural cohesion around the production of coal:

*“In Romania’s Jiu Valley, the state had long taken a paternal role with the miners, providing them free housing, electricity, heat, water and highly subsidized food in order to assure the promise of upward mobility.” [27] (p. 432)*

Apart from receiving special privileges under the socialist translation of coal-based development, privileges that were not enjoyed by other categories of workers [50], the miners maintained a “relatively sympathetic relationship with the state” (Friedman 2007: 432). Enrollment in the actor network was also achieved via “education [which, in addition to] a working class pedigree, meant promise for young people” [27] (p. 437). The coherence of this actor-network was tested during the 1977 strike, which took place in response to planned cuts in compensations for injured miners. After the benefits were restored, alongside several arrests of labor leaders, the socialist interestment devices, managed to realign the network so that it functioned relatively frictionless until the late 1990s [50]. The coal-production regime thus survived the collapse of the centrally planned economy, but not for long.

#### 4.2. The Network Unravels: The Violent Misalignments of the 1990s and Beyond

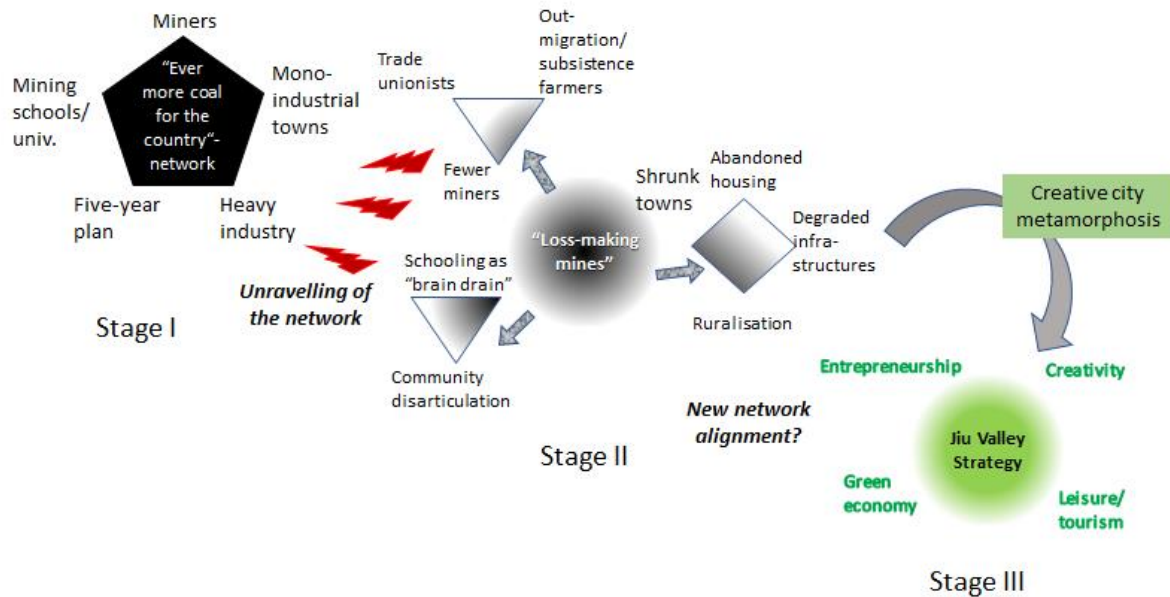
After 1989, the rural and socio-industrial networks, the *complexe* that supported the planned economy, were dismantled but failed to be replaced by a political project for the organization of the Romanian economy after socialism [38]. As a consequence, if social communities were built around the industrial *complexe*, the disappearance of these *complexe* meant the disappearance of the ties that linked them to local public life in the Jiu Valley. Among the most important social consequences of network disarticulation were the following [38]:

- The shrinking of the working class and migration to rural areas, a phenomenon typical of pre-capitalist societies;
- Insecurity, unemployment, underemployment, and lack of employment opportunities;
- The deterioration of the standard of living and the loss of the working class prestige for (heavy) industrial workers;
- Degradation of the housing stock;
- Degradation of urban infrastructure;
- Reduced access to education and health services.

All these consequences have been felt with greater intensity in the mono-industrial areas. Their tighter integration during socialism into one overarching translation around the OPP of coal production suffered a major blow when this problematization was put in question. The Jiu Valley towns were particularly affected, especially after 1997, when shock therapy policies were implemented in Romania after the failure of the policies proposing a combination of neoliberalism and a developmental state in the early 1990s [51,52]. The



tightly coupled actor network of coal production became unraveled, a process that had ramifying consequences for each of the network elements (see Figure 2).



**Figure 2.** Stages of misalignment of the “Jiu Valley development” translation. Source: the authors based on the work of Callon and Law [13].

First, numerous miners were enticed to leave the translation—being offered between 12 and 20 monthly salaries—to become “voluntarily redundant” [51,53]. Between 1997 and 2007, the population employed in the mining industry decreased by 68% [44]. Many of those who left the mines returned to their places of origin in the Moldova region of Romania [54]. The Jiu Valley area has also become an important source of emigration for work to Western Europe [48]. For a significant part of the inhabitants, seasonal work in agriculture in Western Europe has been the solution that could ensure their subsistence [55] (Muscă and Trifan 2022). Women also became temporary migrant care workers in Italy or Austria [56]. They often live together with the person or persons they care for, which is a demanding type of work with severe consequences for the physical and mental health of the carers [55]. In sum, multiple career trajectories and migration marked the period after the closure of the mines. All these individuals with their families can be said to have been attracted to alternative translations that were not premised on the production of coal—the former OPP of the area—but on individualized survival strategies, either as subsistence farmers (in Moldova) or low-skilled workers (in Western Europe).

In the early 1990s, trade unions, represented by the League of Jiu Valley Miners’ Unions, opposed restructuring and wage cuts—in essence, the disarticulation of the coal-based actor network. The level of trust in the unions was high. As Kideckel mentions, “the miners readily transferred their allegiance from state to the union and to its president, Miron Cozma, whom many saw as a savior of their way of life.” [54] (p. 49). Other studies discuss the lack of trust in company managers and union leaders, calling them “the people in the offices,” who were seen as being complicit in the closure of the mines [35]. Miners see the relationship with unions in terms of “us and them,” perceiving that they have no influence on the union [35]. At the same time, since the late 1990s, there has been fragmentation and even conflicts between trade unions as they compete for members and financial gains from mine closures [54] (p. 77). This has shattered the “unity of the mine” and has revealed the “diversity of the miners” [57] and the ways in which the trade unions have provided selective benefits to their miners rather than to the Jiu Valley miners as a class.

The abrupt reduction of the work force set in motion the depopulation process [58], which began to unravel the functioning of the mining towns as urban structures, leading

to community disarticulation. Public infrastructure has deteriorated in the context of the impoverishment of local administrations. The smallest town in the Jiu Valley, Aninoasa, went bankrupt in 2010, immediately after the mine closed for good.

The localities where the mining industry has been declining over the last thirty years are described as shrinking towns [44]. Characteristics include demographic decline and aging population, unemployment and reduced employment opportunities, poverty, inadequate living conditions, and declining quality and attractiveness of urban life. Some neighborhoods such as *Dallas*, *Colonia Bosnia*, *Colonia Ianza*, *Venus-Saturn*, and *Saşa* are known as marginalized urban areas with high levels of poverty, deteriorating infrastructure, and utilities, with a population that has little access to education, health, and social services [55]. Being now inhabited mainly by miners laid off after 1997, the transformation of these areas has been radical, going from relatively prosperous areas to neighborhoods with skyrocketing poverty [51]. In theoretical terms, it can be said that the strength of the actor network for the extraction of coal has now turned into its main weakness, in that the collapse of the mine has pushed the workers' living spaces into disarray.

According to an analysis carried out by the World Bank for the Ministry for Development, Public Works and Administration, the six cities of the Jiu Valley are in a challenging situation from a demographic point of view, and forecasts for 2030 are that the demographic evolution will continue the downward trend [59]. In fact, the shrinkage of small towns is also prevalent at the national level. According to Romania's *Territorial Development Strategy* (2016) [60], there is a notable trend of ruralization of towns with less than 20,000 inhabitants, as they are left without urban facilities such as heating or water supply, which have become too costly for the purchasing power of their residents. Bănică and his colleagues use concepts such as "de-urbanization" or "neo-ruralization" to describe how the small towns have become incompatible with the urban status [45]. Additionally, there has been an increase in the population engaged in subsistence farming and a deterioration in living standards in many of these towns. These small towns were the first to feel the shock of the transition from a state-planned economy to a capitalist market economy, with all social structures severely disrupted. A violent misalignment occurred in the mono-industrial towns, which saw their functional ties to the industry abruptly severed. They proved unable to reproduce their economic and social functions in the new economic context where the dominant political discourse was against state interference in the economy and the absence of local resources. With the withdrawal of the state and without private investors, small towns such as those in the Jiu Valley faced multiple crises: economic, housing, infrastructure, demographic, and identity [45,54].

To summarize, stages one and two of the Jiu Valley network allow an understanding of the systemic problems that took the form of radical deindustrialization and de-economization [45] (see Figure 2). The mono-industrial towns of the Jiu Valley were all designed as local instantiations of the translation of coal-based development. In other words, they were almost copycat models of the same mining town template, each of them structured around an individual mine. This can be traced back to the Soviet or socialist model, which imposed "similar functional origins", as has been observed in several Polish towns [61] (p. 7). In Hungary, the city planning principles were decisive in terms of functional (industrial) zones in cities, despite inevitable variations [62]. In the Jiu Valley, they all had similar structures with little complementarity among them (for a counter example, see [63]). They had limited ability to diversify and become cities in the proper sense—as they never pursued an actual path of urbanization [45]. As a result, in the second stage of network misalignment, their de-urbanization pushed them closer to a rural model of development, which had regressive consequences for the whole Jiu Valley area. Under changed deindustrialization policies at the national level, following a neoliberal logic [52], the Jiu Valley actors were forced to assemble an enfeebled local network, which lacked the coherence of the pre-1990 development model.

#### 4.3. Towards a New Alignment? The Jiu Valley Strategy and the Challenge of a Just Transition

There were several early attempts to marshal a new development network in the Jiu Valley before the *JVS*, but they mostly failed for the lack of a viable obligatory passage point [11]. Economic investors did not find it profitable to convert old mining sites or invest in new industries, despite the tax facilities offered by the Romanian Government between 1998 and 2008 to all companies that chose to open a business in areas considered disadvantaged, such as the towns of the Jiu Valley. The new investors were exempted from income tax, customs duties, and taxes imposed for changing the use of the land required for the investment [64]. There are studies that argue that policies aimed at improving the economy and living standards in former mono-industrial towns were inconsistent and had a low impact [44]. For example, according to a survey conducted after the end of state aid, most of the business owners who benefited from tax incentives for investments in disadvantaged areas expressed their intention to cease economic activity in those areas [64]. The transformation of the Jiu Valley into a tourist destination has been considered the primary alternative for the area's development in all local development strategies. Still, tourism has been considered an overrated solution with modest results [44]. At the same time, professional reconversion and entrepreneurship support programs, as well as other tax reforms, have had limited success: they were implemented much too late after the closure of the mines and the compensatory payments offered to laid-off workers [44,54]. The limited interest of investors can be read as a form of network opportunism. The state aid offered to the Jiu Valley towns worked as an obligatory passage point, but this was not followed by enrollment and mobilization since much of the local workforce and infrastructures remained outside the network.

A recent qualitative study analyzes how the transition affected women in the Jiu Valley, as social protection measures focused mainly on the miners, most of them men [49]. These women have a rather pessimistic view and low confidence with regard to the area's development. The interviewees mainly invoked the scarcity of private sector jobs, which are also poorly paid and uncertain. Another important reason is the general lack of confidence in authorities. The perception is that central and local authorities have proved incapable of mitigating the brutal economic and social impact of mine closures in the past decades and providing a viable alternative for redevelopment. At the same time, at the local level, there is a perception that migration to larger cities in Romania or Western European countries has become widespread, and young people's aspirations are not linked to the Jiu Valley. Last but not least, for the most vulnerable of those remaining in the Jiu Valley, the interviewees appreciate that the impact of social protection measures has been modest in response to the severe economic problems [55] (pp. 76–82).

The current strategy to revitalize the Jiu Valley is ostensibly built around a just transition framework. According to the International Labor Organization understanding of just transition, which the European Commission also uses, the transition should be based on principles similar to those formulated in the Sustainable Development Goals (SDGs), such as the creation of decent jobs for all, the eradication of poverty, social protection and social inclusion [65]. At the same time, policy measures should be context-sensitive and take into account nine policy areas: macroeconomic and growth policies; industrial and sectoral policies; enterprise policies; skills development; occupational safety and health; social protection; active labor market policies; rights; social dialogue and tripartism [65].

Recognizing the Jiu Valley area as being in economic distress with the mining industry's decline, the Ministry of Investments and European Projects has developed the Jiu Valley Economic, Social, and Environmental Development Strategy (2022–2030). *JVS*'s objective is to provide a framework for the socio-economic development of the area in the context of multiple attempts to complete the transition away from coal and diversify economic activities. At the same time, for the transition to be successful, *JVS* argues that a "radical change of mentality and life as a whole" [19] (p. 5) is needed. The *JVS* vision considers actions such as developing the renewable energy sector, developing year-round tourism, and the professional reconversion of the workforce.

The strategy is organized around four pillars around which an action plan for the next period has been developed. These pillars are the following:

- Improving the quality of life and creating a healthy and sustainable environment for future generations.
- Economic diversification, innovation, and entrepreneurship.
- Sustainable use of local specificity.
- Accessibility, mobility, and connectivity.

The first pillar reiterates that the transition away from coal must be achieved without major social costs. The broad concept of quality of life is operationally defined through a series of measures that facilitate the improvement of human capital (with actions such as modernizing education, health, and social services), boost employment (with activities such as professional reconversion programs), and protect the natural environment (with measures such as reducing pollution and greening the former mining areas). The second pillar focuses on measures to support entrepreneurship (either by supporting local entrepreneurs or attracting businesses to the area) and investment in the green energy sector. At the same time, many activities aim to develop entrepreneurial “skills and culture” in the region. The third pillar focuses on supporting tourism development in the region, with activities such as modernizing tourism infrastructure, services, and activities, supporting creative industries, and organizing cultural, sports, and leisure activities. Finally, the fourth pillar aims to increase accessibility in the six cities in the region and connect them by modernizing road and rail infrastructure to adapt to urban mobility needs.

From a theoretical point of view, the *JVS* can be seen as an actor-network-building exercise that is problematic on several counts. First, all the measures have in common the promotion of a discourse that emphasizes individual responsibility, an element considered essential for the area’s redevelopment. In a complementary way, failure is explained in terms of the refusal to take responsibility by the citizens. In this sense, the need for a radical change of “mentality” is often invoked for the transition to take place successfully. In fact, the strategy is considered “an approach to increase the capacity and responsibility of every citizen of the Jiu Valley to propose and participate in the implementation of actions for socio-economic revitalization and transition away from coal” [19] (p. 1). It is noteworthy that a diverse set of *collective problems* are addressed via individualized solutions. Positing a generic “individual” as the obligatory passage point of the network means to diffuse and even atomize the network-building effort. Second, this is based on the naive assumption that the “individual” is simply there and available to assume responsibility for redevelopment. As stage II has shown, however, when faced with the abrupt removal of coal as the OPP of the Jiu Valley development, local families resorted to a variety of micro-network building efforts, leading them away from the Jiu Valley or at least away from the crumbling resources of their local communities.

In terms of problematization as a network-building strategy, the *JVS* states that the transition process is facilitated by the inclusion of the Jiu Valley as a pilot region in the “Coal Regions in Transition” platform and by the possibility of accessing EU funds from the programs such as the “Just Transition Mechanism”, “European Green Deal”, and “EU Cohesion Policy”. At the same time, however, the strategy fails to demonstrate how the Jiu Valley can be made indispensable for each of these EU-wide mechanisms, which have been devised as limited-time opportunities for those regions that can play a role on European markets, be they economic, labor, technology or environmental.

The *JVS* proposes a generic action plan in which institutional and financial responsibility for implementing projects and programs is diffuse. Although funding sources that can be accessed to ensure a just transition are mentioned, it is difficult to address the systemic problems accumulated over the past decades in the Jiu Valley. Moreover, each funding source is issue-specific (e.g., for regional cohesion, for the green economy etc.) and can hardly counter the dismantling of the coal-production network, which was designed to function as a totality.

The “shrinking area” status, which entails a high level of poverty and territorial socio-economic segregation (sometimes overlapping with ethnic segregation), makes it difficult to implement programs aimed at supporting entrepreneurial initiatives, such as developing the creative sectors, green economy, and tourism. Thus, the strategy is rather a general framework for attracting European funds, but these are insufficient in functioning as inter-essement devices. As a result, attracting funds does not automatically ensure development, as there is rarely a sustainable continuation of the programs after the end of the funding. Rather than creating its actor-network to facilitate local development, the *JVS* enforces the idea that local development needs to pass through the problematizations and obligatory passage points of EU funding requirements. In contrast to the coal-based actor network, the model of development for the Jiu Valley area is not imposed but rather optional.

There is a strong emphasis on creativity in the strategy, which gives a sense of a desired creative-city metamorphosis (see Figure 2). The Romanian words for “creative” or “creativity”, *creativ* or *creativitate*, are mentioned 37 times in the *JVS*. The latter (*creativitate*) crops up in connection with “the stimulation of”. There is no definition of creativity; however, the only explanatory remark is that the lack of creative stimulation (of school children) is seen as a symptom of poor education. The encouragement of creativity is seen as a source of addressing local ills. The “quality of life” concept figures even more prominently in the *JVS*, with the first “pillar of the strategy” being devoted to “The improvement of the quality of life and the development of a healthy and sustainable environment for future generations.” [19] (p. 34). Capturing the gist of the *JVS*, we argue that it seems to be based on a developed urban model focusing on the quality of life and creativity (à la Richard Florida, [21,22] or see the critical work of John Hannigan in his *Fantasy City* [66]). In general terms, this model has been shown to be problematic in Eastern Europe [67,68].

In the particular context of the Jiu Valley, we argue that the creative city is part of an entirely different kind of translation of development, one that includes a critical mass of university-educated urban residents, above-average urban facilities, and above all, the three Ts of technology, talent, and tolerance [22]. These stand in contrast to the working-class culture of the Jiu Valley, and a militant culture at that [50], and the dearth of technological development that goes back to the 1980s. In other words, the local ingredients of an actor network premised on creativity are missing in the Jiu Valley, and thus, there is not much to align through the *JVS*.

Closely related to the quality of life and creativity is “education”, which receives more than 100 references in the *JVS*. As part of the actor-network of coal production, education was an important secondary element: the developing structures of coal extraction were supported by a tailored system of technological education. Once the production of coal has been drastically reduced, education is called upon in the *JVS* to play an *independent* role as the driver of development [19] (p. 54). This can hardly be successful since education is efficient when and to the extent to which the whole network works well.

Our analysis is not meant to suggest that the *JVS* for 2021–2030 will be devoid of a positive impact on development. However, we hypothesize that its effects will be rather limited, issue- and place-specific, rather than applicable to the Jiu Valley towns as a whole. We thus expect small and fragmentary so-called “islands of development” rather than a comprehensive development process as the *JVS* purports to offer. An opposite example is the robotics hub organized by the *Planeta Petrila* NGO [55]. Launched as a laudable effort to mobilize educated and tech-savvy youth from the town of Petrila or nearby towns, this initiative tries to connect to transnational trends of development, but for this very reason, it tends to be solipsistic, aloof to local needs [66]. In actor-network terms, it can hardly be said to work as an obligatory passage point for the development of the Jiu Valley.

Similarly, the development of the green economy in the *JVS* is discussed in vague terms. The strategy invokes “attracting” companies from the green economy or the circular economy to “promoting” green energy or smart city systems, but there is no mention of the “primurn movens” [11] (p. 203) of this whole process. Neither the state nor corporate or civil society actors are singled out as the possible first mover of the process of local



development. This stands in marked contrast to the coal-based actor network, as it was premised on the overpowering role of the state. The contemporary national state is far from being able to perform this function, but there are also no congeries of actors that can perform an equivalent developmental role. To summarize, the *JVS* proposes a network that lacks the critical focal points (obligatory passage point, enrollment, and mobilization) that would make for a realistic development strategy.

## 5. Conclusions

In an article published three decades ago in *Rural Sociology*, William Freudenburg stated that:

*“The encouragement to develop extractive industries is often coupled with the advice to avoid developing an excessive dependency on a single economic sector. [However] the very regions and nations having the greatest need to hear such advice may also have the lowest realistic ability to respond to it.”* [69] (p. 305)

The history of the Jiu Valley seems to illustrate this claim in exquisite detail, and we have outlined the reasons for this by distinguishing three stages. The first explains the extraordinary degree of network alignment around the ever more intense production of coal during the planned socialist economy in Romania. The second stage captures the profound network misalignment that set in once coal production’s obligatory passage point was abruptly removed. This happened following the World Bank and IMF requirements on the Romanian Government to stop subsidizing the “loss-making” mining sector [51,53]. The third stage captures the current attempts to devise an area-wide development strategy for the Jiu Valley.

Our key argument is that the *JVS* and its workability can best be understood and assessed *in close relationship* with both the first and the second stages. The first stage reveals that the production of coal assumed an actor network of such coherence that it essentially suppressed local economic diversity. The miners’ extractive activity was the central goal of family and community life [54], so the urban formations from the Jiu Valley were only viable to the extent to which they functioned within a tightly planned and growth-oriented economy. These regions were structurally bereft of diversity for a long time, so it is unrealistic to expect the sort of intrinsic variability of economic life (agriculture, small manufacturing, etc.) that the *JVS* appears to take for granted.

The second stage reveals another facet of the history of the area to set in contrast with the assumptions of the *JVS*. The collapse of the obligatory passage point represented by coal production has thrown the area into disarray, which took the form of a ramifying unraveling of the network. This unraveling reached into every aspect of local life, from housing, food provision, and entertainment to family life, education, and political organization. The result of this were the desperate efforts of the actors to secure access to at least some resources of the local economy, which took the form of micro-level alignments. Almost any sort of collective resource was thus selectively appropriated by individual actors, often to the exclusion of others. The expectation harbored within the *JVS* that actors may be persuaded to rejoin an actor network and share resources that have in the meantime become individualized seems largely unfounded. The second stage thus problematizes the suggestion that the redevelopment of the Jiu Valley can happen as if collective resources are still there where the collapse of the mining industry left them. This, however, is highly problematic, as the second stage has shown.

There are some useful lessons to be learned from this analysis for critical reading of the just transition, at least in Central and Eastern Europe. First, the just transition needs some basic premises in order to be successful, such as a minimally diversified and democratic local economy. This means a reduction in socio-economic inequalities and halting the out-migration flows, which have been on the rise since the contraction of the local economy. Second, the just transition cannot be applied to an area of relative decline—characterized by de-urbanization and de-economization—without first stabilizing the area by providing a minimum of public investment. This does not mean the mere attraction of European

funds but a long-term public commitment to ensure predictability and stability over the long term. Third, the just transition concept has been conceived in the developed contexts of Western Europe. We propose a radical learning experience starting from one of the extreme cases, such as the Jiu Valley, rather than from the typical, near-average EU coal regions. The applicability of the just transition framework to cases of extreme post-coal contraction should not take the form of context-insensitive application but rather of careful testing and fine-tuning. Perhaps the main limitation of the paper is the absence of primary empirical data used in the analysis. However, the paper can contribute to the post-coal transition literature due to its wide-range focus on the history of an emblematic coal-mining region of Romania. As a novel contribution to the post-coal transition research, ANT allows a comparison of network alignments across different historical periods. In this way, it provides a heuristic understanding of how actor networks achieved their strength in a certain historical period, how they declined in another period, and how challenging it is for the post-coal strategy to reassemble the network around a far-flung and “footloose” development model of the creative/green economy.

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