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## #330 – Reinventing *Stahlstadt* – Research Methods to Reimagine Steel Towns, sustainability and collective geographies

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### Abstract

*In Jules Verne's imaginary, Stahlstadt, the city created by Prof. Schultze in "The Begum's Fortune" (1879) is the evil city "par excellence": unhealthy, unfair, and based on a warfare economy; its symbol: steel. The idea of the industrial town being dangerous, treacherous, and ruthless, as opposed to the idealistic world of the hygienic city, is one of the cliches of the late XIX century, especially if we see the importance of coal and steel for the European history between 1914 and 1960s. The steel industry has been vital to industrial development and economic growth, but its environmental and health impacts have been significant. In recent years, there has been a growing concern about the sustainability of steel production, particularly in regions where environmental regulations are lax.*

*This study investigates the relationship between steelworks and geography, with a focus on the city of Taranto in southern Italy. Taranto is home to one of the largest steel mills in Europe, and its proximity to the city has been a source of environmental and health concerns for local residents. The research utilizes data from a recently financed Horizon project that analyses the steel industry's impact on the environment and public health, with particular reference to non-communicable diseases. The study conducted at UoS focuses on the human geography component and the policy and regulatory framework that has contributed to the sustainability challenges facing the steel industry in Taranto. It highlights the need for stricter environmental regulations and a shift towards more sustainable production processes to ensure the long-term sustainability of the steel industry in the region.*

*Overall, the main aim is to provide valuable insights into the relationship between steelworks, heritage and geography and highlights the urgent need for action to address the sustainability challenges facing the steel industry in Taranto and other regions.*

### 1. INTRODUCTION

*Dreary roads, black with cinders and coke, wind round the sides of the mountains. Heaps of variegated scoria, which the scanty herbage fails to cover, glance and glare like the eyes of a basilisk. Here and there yawns the shaft of a deserted mine, a dark gulf, the mouth grown over with briers. The air is heavy with smoke, and*

*hangs like a pall over the ground. Not a bird nor an insect is to be found, and a butterfly has not been seen within the memory of man.*

In this terms Jules Verne vividly depicts the formidable metropolis of Stahlstadt, known as the city of steel, as an expansive urban space characterized by precise geometric design (Verne, 1879). It is fortified with walls and closely guarded gates, effectively controlled by armed personnel. However, amidst this disciplined environment, vast areas lay abandoned, with dormant mine shafts and open spaces devoid of human presence. The human geography of Stahlstadt exemplifies a striking duality between abandonment and concentration: the inhabitants are concentrated in modest Germanic dwellings or within the steelworks and mines—the only areas where they are permitted to reside. Beyond these boundaries lies desolation.

Analogous to John Milton's Pandemonium (Milton, 1887), the capital of demons hastily constructed within an hour, Stahlstadt similarly materialized in an exceptionally short timeframe. Verne, who conceals his unmistakable anti-German sentiment, describes the accomplishments of German industry with a tinge of envy. On the opposing side of Stahlstadt lies Franceville, a city epitomizing hygiene and an era of prosperity, characterized by tree-lined boulevards, public sanitation, and an idealistic form of paternalistic socialism. It is an intriguing duality within *Vernian* urbanism, an interplay between French pastoralism and Germanic proto-fascism, both awe-inspiring and dreadful.

The contrast between steel production, particularly in relation to hygiene, reflects a prevalent perspective of the period that still resonates in today's world. In Europe, steel production continues to be associated with significant environmental pollution and socioeconomic deprivation. The phenomenon of urban decline, particularly in cities most affected by deindustrialization, has reshaped the environmental and human geography of these antiquated Stahlstadt(s).

This paper presents an ongoing research project that has recently commenced, and at this stage, two key objectives are of utmost importance. Firstly, it is essential to carefully design and strategize the different aspects of the research in order to maximize its impacts while maintaining a high level of rigour. The aim is to ensure that the study represents a significant advancement in the discipline by contributing novel insights, innovative methodologies, and robust findings. This requires meticulous planning and consideration of various factors, including the selection of appropriate research methods, data collection techniques, and analytical frameworks.

Secondly, given that this research is part of a broader investigation into the impact of steel mills on communities from clinical, social, and economic perspectives, it is crucial to harmonize the methods and methodologies with those employed by other researchers involved in the overarching project. This harmonization ensures compatibility and comparability of data, analysis, and outcomes across different sub-parts of the research. By aligning methodologies, it becomes possible to generate a comprehensive understanding of the multifaceted impacts of steel mills on various dimensions of communities, facilitating a holistic assessment of the issue.

Through the analysis of methodologies and different approaches to sustainability, this paper aims to explore and elucidate the concept of the Steel Town, specifically within the European context where steel production has experienced a steady decline since the 1980s. We contend that the health and environmental issues faced by these cities, as well as instances of social and economic marginalization, are not solely a result of internal production crises. As Strauss asserted in 1961, they stem from an oversimplified and negative portrayal of the complex urban fabric through apocalyptic lenses. While ample literature exists on the subject, this study aims to examine certain aspects that have been overlooked, namely: 1. Access to Landscapes and Contrived Landscapes, 2. Access to Buildings and Spaces of Cultural Heritage, 3. Implementing Sustainable Policies, and 4. Narratives of Shared Memories.

## **2. BACKGROUND AND CONTEXT**

The current study is situated within the framework of a broader research endeavour, which is supported by the UKRI and the European Union through the Horizon scheme under the specific program HORIZON.2.1 - Health. More specifically, it falls under the subprogram HORIZON.2.1.2 - Environmental and Social Health Determinants, within the dedicated topic "HORIZON-HLTH-2022-ENVHLTH-04-01 - Methods for assessing health-related costs of environmental stressors". Commencing on 01 January 2023, this comprehensive and CROSS-disciplinary project [mistral B] represents a concerted effort to investigate the multifaceted dimensions of health and environmental interactions, with inputs from scholars from different fields, such as clinicians, architects, sociologists, and AI experts (Istituto Superiore di Sanita, 2023).

By focusing on landscape and environmental, social, and spatial sustainability, the research seeks to unravel the intricate relationships between human health and the surrounding environment. It endeavours to explore innovative methodologies and analytical frameworks that can accurately assess the health-related costs associated with various environmental stressors. Through a comprehensive examination of these factors, the study aims to inform evidence-based decision-making, policy formulation, and intervention strategies to foster sustainable development and improve overall well-being.

### **2.1 Cross-Disciplinarity as Method**

The fields of inquiry addressed in this study necessitate a critical examination of the methodologies employed, as evident from both the research themes and the ambitious impacts they strive to achieve. Particularly within the realm of contemporary geography, the topic of deindustrialization demands an effort to adapt established techniques by incorporating approaches and social agencies that extend beyond conventional analyses of industrial areas and enters in traditionally different fields (Curtis, 2004).

As highlighted by Mei-Po Kwan, the dichotomy between positivist/quantitative and critical/qualitative methods has marginalized the contributions (Kwan, 1999) of scholars from diverse philosophical perspectives (Kwan, 2012), including feminism. However, this division can be dismantled through the creative and intricate utilization of Geographic Information Systems (GIS) in conjunction with other approaches such as geolocating oral histories, narratives, videos, maps, and drawings (Schuurman and Pratt, 2002). By

integrating these methodologies, the traditional framework for studying industrial areas, which has revolved around the triad of Environment, Social, and Economic factors, can finally encompass the missing pillar of Culture. Sarah Elwood emphasizes that the boundary system governing the association of spatial data is initially defined at the level of state power before being influenced by supra-spatial considerations (Elwood, 2006). Consequently, the outcomes are intertwined with a concept of association grounded in the critical experiences of users.

An enlightening example in this regard is the work conducted by Forensic Architecture, which demonstrates how the design of experiments can yield results that are relevant to the advancement of social justice, without compromising rigor and originality. By employing innovative methodologies, Forensic Architecture successfully navigates complex socio-spatial issues and contributes to the broader discourse on social justice. Their approach exemplifies the potential to reconcile critical perspectives with methodological precision, ultimately pushing the boundaries of knowledge in pursuit of transformative societal outcomes.

### **3. METHODS OF ENQUIRY**

Within human geography, a significant challenge lies in avoiding the risk of employing overly broad “umbrella terms” that are commonly used, such as “land grabbing” or “labour trafficking,” without a robust framework for mining, selecting, and representing data. Merely relying on GIS as a methodological tool is insufficient in establishing a comprehensive cognitive visual structure, as highlighted in (Cockbain, Bowers and Hutt, 2022).

When examining post-industrial areas, previous research has primarily focused on economic and policy analysis, often leaving narratives in the hands of private actors, as observed in the case of industrial museums discussed in (Del Pozo and Gonzalez, 2012). Unfortunately, this has resulted in a diluted historical and political message, as critical aspects of working experiences, such as exploitation or labour struggles, have been ignored or underestimated.

To reconcile the spatial dimension represented by maps and the quantitative dimension with the human dimension, incorporating narratives becomes crucial. Narrative geography offers an avenue to integrate stories of workers’ families, providing a more holistic understanding. An illustrative example can be found in the case of Casale Monferrato, Italy, as explored in (Borgogno *et al.*, 2015). While this article may exhibit an excessive self-referential nature from one of the authors, it introduces the notion of familiarity within the post-industrial narrative. However, this approach, although prevalent in psychological studies, lacks a foundation in geographical elements or clinical models. The MISTRAL project, as mentioned earlier, seeks to overcome this limitation through two strategies: fostering cross-disciplinarity in research and data construction and aligning with the “METEOR” cluster, which encompasses the winning consortia of the HORIZON-HLTH-2022-ENVHLTH-04-01 call. By adopting these approaches, the project aims to enhance the understanding of post-industrial contexts and their complex interplay with human experiences.

## 4. SUSTAINABLE ARENAS AND PUBLIC GEOGRAPHIES

One of the fundamental principles underpinning this study, particularly in relation to landscape, heritage, and memory, is to avoid reducing the -isms and subjects of investigation to mere “labels” through methodological flattening (Golledge, 2006). This principle arises from a historical necessity that predates methodological considerations. In post-World War II industrial communities, industrialization was implemented under strict state control, as exemplified by the Marshall Plan in Western Europe and the Warsaw Pact in the Eastern bloc, particularly in agricultural regions (Steil, 2018).

### 4.1 – Methodologies Analysis

This intricate and multi-faceted complexity sets the boundaries for the forthcoming study and delineates the four areas of interest: 1. Access to Landscapes and Contrived Landscapes, 2. Access to Buildings and Spaces of Cultural Heritage, 3. Implementing Sustainable Policies, and 4. Narratives of Shared Memories. These research domains encompass the exploration of challenges related to limited entry into specific landscapes, the presence of artificially constructed landscapes, the disappearance of collective memory, and the associated impacts on communities, identities, and social dynamics.

For each of the topic we can find a series of typical or established methodologies, that can be expanded and implemented with the support of more-impactful methods, including, for instance, participatory mapping, or social network studies.

#### 4.1.a – Access to Landscapes and Contrived Landscapes

The main methodology is the one based on *Traditional Surveys and Interview*. Collecting data through on-site surveys and interviews with individuals to understand their experiences and perceptions of restricted access to landscapes (Montello *et al.*, 2006). This approach provides qualitative insights into the challenges faced by communities. However, it may be limited in scope and susceptible to biases and subjective interpretations (Webb *et al.*, 1999).

Additionally, a further established methodology for multidisciplinary approaches is the one based on *Spatial Analysis and Remote Sensing*. Utilizing GIS and remote sensing technologies (Simoonaga *et al.*, 2009), such as satellite imagery (Albert, Gesler and Levergood, 2000), can help assess changes in landscapes and identify areas of restricted access. This approach provides objective and spatially explicit data. On the other hand, it may lack a comprehensive understanding of the social and cultural dimensions associated with restricted access (Stewart Fotheringham and Rogerson, 1993) and (Goodchild, Haining and Wise, 1992).

#### 4.1.b – Access to Buildings and Spaces of Cultural Heritage

In the field of cultural and building heritage, we can have different approaches. On the historical side, one of the more effective can be *Archival Research and Historical Analysis*. This method involves conducting extensive research in archives, historical documents, and records to understand the historical significance of buildings and spaces of cultural heritage (Montello *et al.*, 2006) and (Ward, 2020). It provides insights into the evolution

of these spaces over time, but it may be time-consuming and reliant on available historical data, which might have limitations relate to the author's background, as in (Said's, 1978).

Furthermore, researchers and scholars often recommend the *Heritage Impact Assessments*, a method that involves a series of assessments to evaluate the potential impact of proposed developments on buildings and spaces of cultural heritage (Silva and Rodgers, 2012) and (Pereira Rodgers and Van Oers, 2012). They involve expert assessments, surveys, and consultations to determine the significance and vulnerability of heritage assets; this approach helps identify potential threats but may lack community perspectives and engagement (Patiwael, Groote and Vanclay, 2019).

#### *4.1.c – Implementing Sustainable Policies*

The field of public policies is the one with – typically – the less community-engagement but can presents relevant advancements in terms of impacts and long-term benefits. The typical research is based on *Policy Analysis and Evaluation*: this approach involves reviewing and analysing existing policies to assess their effectiveness in achieving sustainable goals (Bailly and Gibson, 2004) and (Massey and Meegan, 2015). This approach examines policy frameworks, implementation strategies, and outcomes, but – due to the intrinsically political nature of the analysis, it may overlook the complex interactions between policies and contextual factors (Duke and Schmidt, 2011).

Another methodology, also widely used, is the *Stakeholder Consultations and Participatory Decision-Making*. This methodology (Elwyn *et al.*, 2017) helps in engaging stakeholders through consultations and participatory processes allows for the inclusion of diverse perspectives and interests in policy development. This approach fosters collaboration and ownership of sustainable policies, but it can be time-consuming and challenging to ensure meaningful participation and representation of all stakeholders (Webler and Tuler, 2006).

#### *4.1.d – Narratives of Shared Memories*

Finally, the field of collective or shared memory, is the one in which the researcher can explore in a more-effective way innovative or creative techniques. Typically, we have two main approaches, the first is the *Oral History Interviews*. Conducting interviews with community members and recording their personal narratives and memories provides valuable insights into collective memory (Sangster, 1994) and (Summerfield, 2004). This approach captures lived experiences and preserves oral traditions. Unfortunately, it may be influenced by individual perspectives, memories, and biases (Jessee, 2019) and (Khoma, 2019).

The second approach is the *Archival Research and Cultural Documentation*. Examining archival materials, photographs, maps, and other cultural artifacts can help uncover historical events and narratives embedded in collective memory (Nora, 1989). This methodology offers a deeper understanding of the socio-cultural context but may be limited by the availability and accessibility of archival resources (King, 2012).

### **4.2 – Innovative Methods**

The study of methodologies in this research provides a comprehensive framework for assessing the equilibrium between methodological approaches and associated risks in relation to the specific goals and requirements of various fields of study. While the existing methodologies are undeniably valuable, there is a need to enhance them through creative processes (von Benzon *et al.*, 2021). This enhancement aims to achieve a clearer understanding of the research's impact on local communities, moving away from repetitive approaches that oversimplify the complexities described earlier. Simultaneously, adopting a multi-factor and multi-data approach facilitates productive dialogues between experts and scholars from diverse disciplines, allowing for the mutual enrichment of their respective studies by incorporating external perspectives (Darbellay, Moody and Lubart, 2017). This interdisciplinary approach forms the foundation of the consortium's collaborative efforts (Istituto Superiore di Sanita, 2023).

To complement the traditional methodologies, four innovative approaches have been carefully selected based on theoretical considerations and secondary data analysis. By incorporating these innovative methodologies in traditional techniques, as GIS, the analysis of data can be further refined (Xiao, 2015). These approaches enable the creation of experiments tailored to populations that exhibit variations in factors such as population size, educational access, census data, geographical location, and more (Harris, 2016). The main description outlines the specific methodologies, highlights their strengths, and identifies the data requirements, while TAB.01 proposes for each methodology potential experiments, outlines the inputs, and anticipates the potential outputs associated with each methodology.

#### *4.2.a – Access to Landscapes and Contrived Landscapes*

Regarding the topic to access to anthropic and natural landscape, we propose a more comprehensive approach to *Participatory Mapping and Citizen Science*: Engaging local communities (Haklay and Francis, 2017) in the mapping process through participatory approaches empowers them to document and communicate their experiences of restricted access. Combining community-generated data with scientific techniques, such as GPS tracking and mobile applications, allows for the collection of both qualitative and quantitative data. This innovative methodology integrates local knowledge, enhances community engagement, and provides a comprehensive understanding of the multifaceted nature of restricted access to landscapes. The data required for this approach are multi-variated qualitative and quantitative data, such as a) Participatory mapping data generated by local communities (Onencan, Meesters and Van de Walle, 2018), b) Qualitative data on experiences of restricted access (Robinson and Lokina, 2011), and c) Quantitative data collected through GPS tracking and mobile applications (Chan *et al.*, 2020).

#### *4.2.b – Access to Buildings and Spaces of Cultural Heritage*

The topic of access to the spaces and buildings of cultural heritage is today pressuring from different points of study. The approach defined by M. Christine Boyer (Boyer and Crysler, 2012) and Michael Moorcock on “Urbicide” (Carrión Mena, 2023) helps the geographer to define more inclusive ways to understand not only the risk of physical destruction of the cultural urban heritage, but also the risk of forgetting the sense of identity related to the lack of physical interaction with the buildings. The innovative



proposed methodology is *Digital Documentation and Immersive Technologies*. Utilizing digital tools such as 3D scanning (Wachowiak and Karas, 2009) and (Skublewska-Paszkowska *et al.*, 2021), photogrammetry (Yastikli, 2007) and (Yilmaz *et al.*, 2007), and virtual reality (Häkkinen *et al.*, 2019) and (Gaitatzes, Christopoulos and Roussou, 2001), this methodology allows for the creation of detailed digital replicas of buildings and spaces of cultural heritage. These digital representations facilitate virtual tours, interactive exhibitions, and immersive experiences. This innovative approach enhances public access, engagement, and understanding of cultural heritage, even in cases of limited physical access.

In order to create robust data, a selection of primary and secondary data is necessary, and it involves, for instance, a) Digital replicas of buildings and spaces of cultural heritage created through 3D scanning and photogrammetry, b) Multimedia content for virtual tours and c) Interactive exhibitions (Maye *et al.*, 2014) or games (Mortara *et al.*, 2014).

#### *4.2.c – Implementing Sustainable Policies*

The cross-disciplinarity of the research allows also to experiment in fields not directly – or classically – related to architecture and geography, for instance linking real estate market and clinical aspects to sustainable policies. In order to do that, we propose an *Integrated Modelling and Scenario Analysis*. Employing integrated modelling techniques, such as system dynamics modelling (Reilly and Willenbockel, 2010) and agent-based modelling, this methodology enables the simulation and evaluation of various policy scenarios. By incorporating multiple variables and feedback loops, it facilitates a comprehensive understanding of the potential impacts of sustainable policies (Walz *et al.*, 2007). This innovative approach supports evidence-based decision-making, enhances policy coherence, and allows for dynamic adjustments based on changing circumstances. In order to cross-reference the scenarios, the data required will be a) Relevant data on socioeconomic factors, environmental conditions, and health indicators and b) Information on policy options and interventions.

#### *4.2.d – Narratives of Shared Memories*

In a moment in which storytelling is becoming more important than the story itself, an innovative methodology is *Digital Storytelling and Interactive Platforms*. Leveraging digital technologies (Rizvic *et al.*, 2017) and (Vrettakis *et al.*, 2019), this methodology allows individuals and communities such as classrooms (Rizvic *et al.*, 2019) to share their stories and memories through multimedia formats. Interactive platforms facilitate collective participation, engagement, and the co-creation of narratives. This innovative approach revitalizes collective memory, fosters intergenerational dialogue, and preserves diverse cultural heritage. Also in this case, the data, however intrinsically qualitative can be robust, and collected as a) Personal stories, memories, and narratives shared by individuals and communities (Petrelli *et al.*, 2013), and b) Multimedia content, including photos, videos, and audio recordings (Podara *et al.*, 2021).

For each of the proposed methodologies, we can propose a series of Potential Experiments, and underline generic Inputs/Outputs. The result of the study is described in TAB.01.

Proposed Methodology	Potential Experiment	Inputs	Expected Outputs
Participatory mapping and citizen science	Engaging local communities in participatory mapping exercises. Documenting and communicating experiences of restricted access. Combining community-generated data with scientific techniques for data collection.	Participation and engagement of local communities. Tools and resources for participatory mapping, such as maps, GPS devices, and mobile applications.	Comprehensive documentation of restricted access to landscapes. Improved understanding of local knowledge and experiences. Qualitative and quantitative data on restricted access. Enhanced community engagement and empowerment.
Digital documentation and immersive technologies	Utilizing 3D scanning and photogrammetry to create digital replicas of cultural heritage sites. Designing virtual reality experiences and interactive exhibitions based on the digital replicas.	3D scanning equipment and software. Photogrammetry tools. Digital platforms for virtual tours and interactive exhibitions.	Detailed digital replicas of cultural heritage sites. Virtual tours and immersive experiences accessible to the population. Increased public access and engagement with cultural heritage. Enhanced understanding and preservation of cultural heritage.

Integrated modelling and scenario analysis	Developing integrated models using system dynamics modelling and agent-based modelling techniques. Simulating and evaluating various policy scenarios to assess their impacts.	Data on socioeconomic factors, environmental conditions, and health indicators. Model development tools and software. Policy options and intervention strategies.	Insights into the potential impacts of sustainable policies. Evidence-based decision-making for policymakers. Improved policy coherence and effectiveness. Dynamic adjustments based on scenario analysis.
Digital storytelling and interactive platforms	Creating interactive platforms for sharing and co-creating digital stories. Facilitating collective participation and engagement in storytelling activities.	Digital storytelling platforms and tools. Access to multimedia content creation resources.	Preservation and revitalization of collective memory and cultural heritage. Inter-generational dialogue facilitated through digital storytelling. Increased community engagement and participation. Diverse cultural heritage represented through multimedia narratives.

**TAB.01 – Innovative Methodologies – Potential Experiments – Inputs – Outputs.**

## 5. CONCLUSION

In 1979, Walter Tobagi, a renowned journalist from the *Corriere della Sera* who tragically lost his life at the hands of the XXVIII March Brigade in 1980, introduced the term ‘*metalmezzadro*.’ This term (Tobagi, 1979) is a pun on words combining ‘*metalmecanico*’ (metalworker) and ‘*mezzadro*’ (sharecropper), emphasizing the connection between semi-skilled workers in the steel mills and farmers/workers who leased land. In his article, Tobagi argued that the size of the factory, which often overshadowed the surrounding territory, concentrated social and financial capital and energy within its boundaries. However, it failed to effectively redistribute the wealth generated, primarily due to the factory’s insular relationship with the social fabric, the consociative attitude of trade unions, and the unique nature of the ‘*metalmezzadro*.’ These workers were employed in the steelworks but also held mastery over the farmland, reinvesting a significant portion of their income to sustain the rural character of the surrounding region (De Monte, 2014).

The term coined by Tobagi carries profound implications for the ethical, social, economic, territorial, and geographical dimensions of industrial and post-industrial spaces. Metaphorically, it encapsulates the multifaceted complexity of these spaces, extending beyond considerations of health, welfare, and heritage. It encompasses a broader vision for the future and emphasizes the crucial roles of policymakers and researchers. Studying this complex relation, allow us to give a new look to the industrial present, with the ongoing creation of heritage areas, and remind us that sustainability is not only a easily imaginable green utopia, but a urgent need to challenge our ways of production, consuming, and thrive. Using Co-Creative methods to achieve these aims acknowledges the pressing need for a renewed unity of purpose between local communities and academics, acting as a guiding principle in navigating the turbulent and uncertain waters of the Anthropocene's last days.

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