

# Proposals for revitalizing urban post-industrial areas: a case study of a French town

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**Abstract.** The article aims to investigate the current state and identify potential development pathways for the small industrial town of Lavaveix-les-Mines in the Creuse Department of the Nouvelle-Aquitaine region, France. The purpose of this study is to develop and propose architectural and urban planning measures and initiatives for the restoration and reactivation of post-industrial areas using the case of the researched city. The methodology used in this research is based on an interdisciplinary approach that combines architecture, urban planning, urbanism, history, sociology, economics, and ecology. This has contributed to the development of innovative solutions aimed at revitalizing outdated industrial territories while preserving their unique identity. As a result, the most effective concept for architectural and urban planning transformation of the city was found and some specific methods and techniques presented in this study were developed.

## 1 Introduction

In the modern world, many cities are facing the challenge of revitalizing their post-industrial areas, arising from the decline of industry due to the modernization of production processes, regulatory requirements, resource depletion, or progressive changes in the economic structure towards a post-industrial economy. As a result, industrial land plots and adjacent structures, which were once the backbone of urban economy and culture, become 'grey zones', representing depleted and underutilized territories.

In the context of France, a country with a rich industrial heritage, the issue of revitalizing post-industrial areas is becoming particularly relevant and significant. One example of industrial towns facing the challenge of transforming industrial territories and facilities while redefining their cultural

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significance and determining paths for development is Lavaveix-les-Mines in the Creuse Department of the Nouvelle-Aquitaine region.

This town, like many others in the central regions of France, faced social and economic decline in the second half of the 20th century, marked by the closure of industrial enterprises, a decrease in mineral extraction, and shifts in technological requirements. The region found itself on the brink of demographic decline, with the average age of the population exceeding 50 year-olds, and young people leaving en masse for more developed regions of the country in search of better paid jobs and a more comfortable socio-cultural environment.

Nevertheless, such industrial regions not only represent uncertain economic and demographic statistics but also offer opportunities for experimentation, exploration, and implementation of new development strategies. By analyzing the specific challenges faced by the industrial regions, we identified common trends and forecast effective approaches, applying them to Lavaveix-les-Mines. Our conclusions were based on the understanding that sustainable development and the preservation of cultural heritage have become a priority today. This opens up prospects for creating more efficient and adaptable development strategies aimed at supporting and stimulating the revitalization of stagnating regions. We identified such an approach as particularly important in light of the pressing needs for economic reform, sustainable infrastructure development, and ensuring access to quality social services across all parts of France.

The aim of this research is to develop and propose architectural and urban planning measures and initiatives for the restoration and revitalization of post-industrial zones, taking Lavaveix-les-Mines in the Creuse Department as a case study.

## **2 Materials and Methods**

The methodology employed in this study encompasses a wide range of disciplines and approaches necessary for the analysis and implementation of projects aimed at revitalizing post-industrial zones. Developing effective strategies for preserving and restoring the identity of small industrial towns requires an interdisciplinary approach that integrates architecture, urban planning, urbanism, history, sociology, economics, and ecology [1]. Designing sustainable and culturally appropriate spaces involves studying historical documents, architectural artifacts, and the sociocultural environment to preserve and transmit the legacy of the past into the future. In this context, the interdisciplinary approach plays a crucial role in developing innovative solutions for revitalizing outdated industrial areas while preserving their unique identity.

### **2.1 Identification of place identity**

Cities with industrial legacies face the challenge of preserving their identity in the modern world, where economic, social, and cultural transformations can lead to the loss of unique characteristics and the character of places, resulting in global standards and qualities. Preserving the historical and cultural identity of cities such as Lavaveix-les-Mines is significant not only in terms of heritage conservation and cultural richness but also from social, economic, and psychological perspectives [2-5]. This study examines the importance of preserving the identity of small cities with industrial heritage, identifying the main reasons in the context of various aspects of life and the future revitalization of such cities.

To understand the value of preserving the identity of cities with industrial past, it is necessary to consider several key aspects. Firstly, a city's identity determines its uniqueness and attractiveness as a tourist destination [4]. Cities with rich industrial heritage typically possess numerous historical and cultural landmarks that attract tourists from around the world. Losing these distinctive features can lead to a loss of tourism potential and, consequently, a reduction in the economic activity and profitability of the city.

Secondly, preserving the identity of a city contributes to strengthening its social cohesion and the pride of local residents in their hometown. Cultural and historical monuments serve as symbols of belonging to a particular community and rootedness in history [6]. Therefore, supporting and preserving these symbols encourages the development of social solidarity, strengthens social bonds, and enhances the self-esteem of the local population [7, 8].

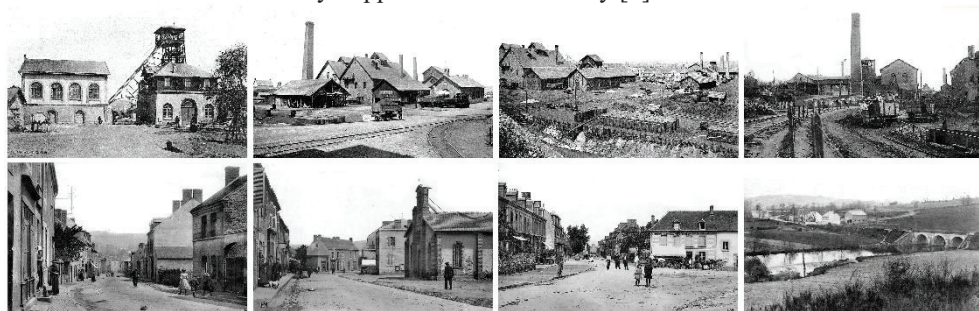
Thirdly, a city's identity influences its economic development and attractiveness for investments. Cities with preserved historical appearance and cultural atmosphere can attract more investors and become objects of cultural tourism and innovative projects in the field of reconstruction and restoration of historical buildings and districts.

Hence, preserving a city's identity is not only an important cultural aspect but also an economic factor contributing to its sustainable development. This article explores the possibilities of current urban planning transformations in the small industrial town of Lavaveix-les-Mines in the context of preserving its industrial heritage as a unique cultural layer of the region.

## 2.2 Methodological approach to studying the city's history: analysis of literature, cartography, natural data, and interviews

The history of Lavaveix-les-Mines is closely linked to the development of coal mining in the Nouvelle-Aquitaine region. In the 19th century, a tin deposit was discovered in the city territory, leading to the rapid development of the mining industry. Subsequently, this made the commune one of the region's most important industrial centres.

The mines were closed in the 1930s due to depletion of resources, but the mining industry still leaves its mark on the city's appearance and memory [9].



**Fig. 1.** History of the town. Cultural-historical context

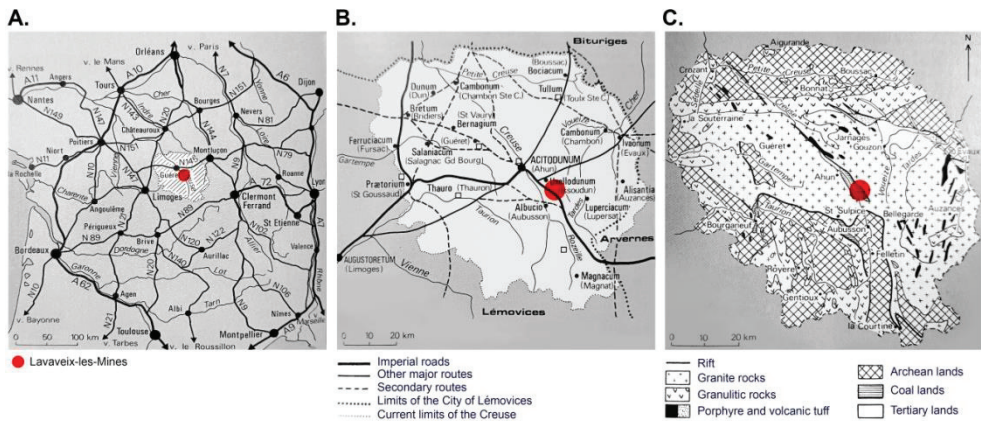
Studying historical heritage of the city, such methods as surveys, interviews, and in-depth literary analysis of unique sources preserved by local residents were used.

In the books 'Géographie de La Creuse' by Paul Joanne and 'Département de La Creuse: géographie, physique, historique, administrative, économique et commerciale' by G. Derennes and C. Delorme, reviews of the geography of the Creuse Department, including its history, features, trade-economic indicators, and cultural characteristics, were presented, as well as the origin of the Lavaveix-les-Mines, its industrial heritage, and its influence on the development of the commune [10, 11]. In the region guidebooks by Gilles Rossignol 'Le guide de La Creuse' – Besançon, La Manufacture, the history, landmarks, and tourist routes of the region are described. It also mentions the attractions of Creuse, the Church of Saint Joseph (Lavaveix-les-Mines), the Museum of Mining Industry (Bosmoreau-les-Mines), etc. [12]. Additionally, some memoirs which describe the 'beauty, history, and culture' of the Creuse Department and its small towns were taken into account in this research [13]. A unique finding was the book 'Métiers et petits métiers d'autrefois en Limousin' by

Robert Guinot, which extensively describes the traditional crafts of the Limousin region, including the Creuse Department [14].

The analysis of sources has provided a profound understanding of the historical context and cultural heritage of the region, which is a necessary step for the development of revitalization strategies and preservation of the city's unique identity. The information obtained about the geographical, historical, and cultural characteristics of the region is the basis for the further analysis and the development of proposals for sustainable development and revitalization of the town of Lavaveix-les-Mines.

During the research, such methods as field surveys, mental mapping, and cartography were employed, which proved to be highly effective in studying the architectural and historical potential of the investigated area (Fig. 2). For instance, the method of cartographic analysis of historical city plans of Lavaveix-les-Mines and the entire Creuse Department allowed us to trace the evolution of the city from its foundation to the present day. This made it possible to identify changes in urban development, determine historically significant areas and objects, and conduct a comparative analysis of the contemporary infrastructure with past periods.



**Fig. 2.** Cartographic materials of the Creuse Department: A.- the Nouvelle-Aquitaine region map; B.- Transport accessibility of the Creuse Department; C.- Geological potential of the Creuse Department [12].

Conducting field investigations allowed for the examination of the architectural landmarks, streets, and squares of the city, identifying their current condition, historical value, and potential for reconstruction or restoration (Fig. 3).

The use of the interview method with local residents proved to be crucial in obtaining valuable information about the city. This enabled us to discern their perspectives on the history, traditions, and cultural peculiarities of the city, as well as the expectations of the local community regarding future architectural and urban planning initiatives. This helped to direct the city's development strategies toward the needs and preferences of the society, making the revitalization process more purposeful and sustainable.

The comprehensive set of methods employed deepened the understanding of the historical context of Lavaveix-les-Mines and its cultural heritage. During the research, it was established that during its heyday, Lavaveix-les-Mines was a picturesque example of industrial development. However, over time, resource depletion, changes in the global economy, and technological innovations led to a gradual decline in the coal industry, capital flight, and population outflow, posing significant challenges to the local community.

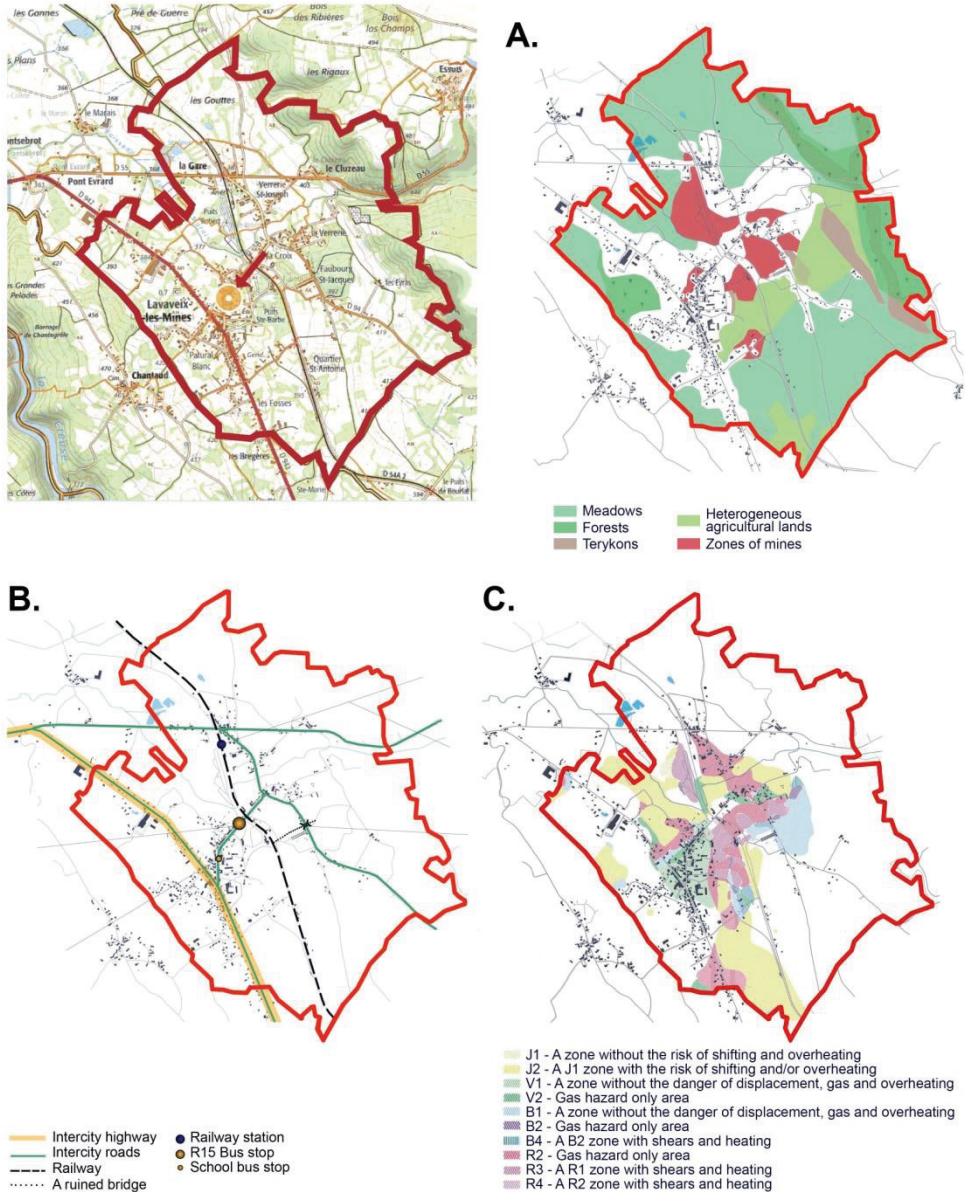


**Fig. 3.** Analysis of real estate properties: A.- street renovation project; B.- project of reconstruction of the railway station with the creation of a recreational area; C.- reconstruction project of the central square [15]

### 2.3 Methodology of integrated design for revitalizing a city with industrial heritage

In 2000, the prefecture of the Creuse Department decided to conduct a study aimed at ensuring the safety of industrial areas and developing a strategy for the urbanization of abandoned territories (Fig. 4) [16]. In response to the emerging problems, governmental authorities and local communities actively began to seek ways out of the situation. One of the strategies that became popular is the implementation of projects aimed at restructuring and diversifying the region's economy using eco-urban planning principles. This includes the development of alternative sectors such as environmentally sustainable tourism, agriculture, and small businesses, which can become the new sources of employment and income for the local population. As a result of such initiatives, there is the potential for gradual revitalization of the economy and social life in sparsely populated regions.

Scientific and practical experience of foreign urban planning schools turned out to be the basis for this stage of research. Delving into the history of the emergence of the term 'eco-urban approach', it was first introduced by experts in the fields of urban planning, architecture, ecology, and sustainable development. It gained wide popularity in scientific and practical circles from the beginning of the 21st century, when issues of sustainable development and environmental safety became priorities for urban planning. Among the first to actively use and develop the concepts of the eco-urban approach were researchers and practitioners in the field of urban planning and urbanism: Jane Jacobs, who was one of the founders of the 'New Urbanism' movement, Richard Rogers, who implemented concepts of sustainable urban development, Kevin Lynch, who developed new forms of city perception, and others [17-20].



**Fig. 4.** Urban design analysis of Lavaveix-les-Mines: A.- analysis of agriculture and industry; B.- transport scheme; C.- areas of critical urban development [15]

Their works are associated with the beginning of theoretical reflection on environmentally sustainable approaches to urban planning. Over time, the concepts of the eco-urban approach have become more widely disseminated and relevant, especially in light of challenges related to climate change, urbanization, environmental conservation, and the stagnation of large industrial areas. This has allowed this approach to become a key element of contemporary urban planning and the reorganization of industrial cities. In summary, the eco-urban approach represents a strategy for planning and developing the urban environment based on the integration of principles of sustainable development, environmental conservation, and social justice into the urban planning process.

Thus, the presented research encompasses specialized methods in the fields of architecture, urban planning, and urbanism towards eco-urban transformations of industrial cities, while also considering the context of the historical and cultural significance of the Lavaveix-les-Mines, including its ecological, social, economic, and cultural aspects [21, 22].

The analysis of these aspects has influenced the development of a new architectural and urban planning concept for the revival of the Lavaveix-les-Mines. This concept envisages the development of industrial tourism as one of the main directions of development, which contributes to the rehabilitation of industrial zones and attracts investments into the local economy.

Based on this analysis, principles of architectural and urban planning transformation of the Lavaveix-les-Mines have been developed, which are based on the preservation and restoration of historical architectural heritage, smart use of space, and creation of open urban spaces for interaction between residents and tourists:

1. Integration of industrial heritage into the urban environment involves the restoration, reconstruction, and adaptation of industrial structures considering their historical and cultural value.

2. Creation of spaces for social activity and interaction involves the development of public and cultural spaces fostering social integration.

3. Promotion of industrial tourism as an economic development factor entails creating conditions to attract tourists through the preservation of industrial heritage.

4. Promotion of cultural diversity through architectural techniques involves supporting and developing local architectural styles and traditions.

These principles serve as the foundation for the development of an architectural and urban planning concept that contributes to the development of Lavaveix-les-Mines as a unique cultural and historical center.

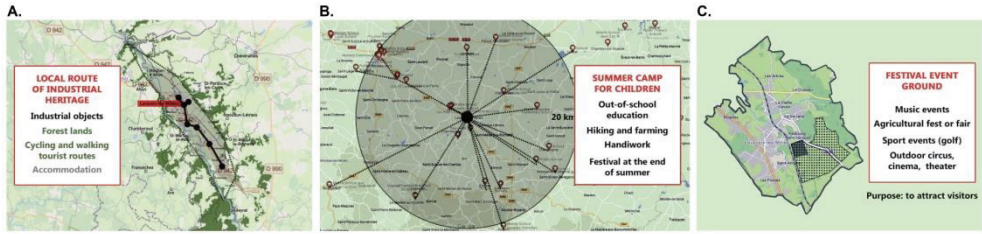
## **3 Results and discussion**

### **3.1 Architectural and urban planning concept for the transformation of the small industrial town of Lavaveix-les-Mines**

In this article, we present the findings of our research focusing on the reorganization of small industrial towns in France, using the Lavaveix-les-Mines in the Creuse Department as a case study. The concept represents a comprehensive approach to revitalizing and transforming the examined industrial town, taking into account its historical, cultural, and industrial heritage. The aim of the concept is to create a sustainable and appealing urban space that preserves its unique identity while adapting to contemporary needs and challenges.

The search for the concept was based on three possible directions, including industrial tourism and the creation of a local tourist route, agrotourism and the organization of seasonal events (such as music festivals, harvest festivals, or village fairs, open-air film festivals, etc.), and the establishment of recreational extracurricular facilities for children during the summer period (children's camps based on farmsteads) (Fig. 5).

Having evaluated the proposed directions and employed the interview method, the idea to create a local industrial heritage route emerged as the most popular choice [23]. Firstly, the local population still feels a connection to the industrial past, and secondly, this concept appeared to be the most comprehensive and capable of incorporating other directions.

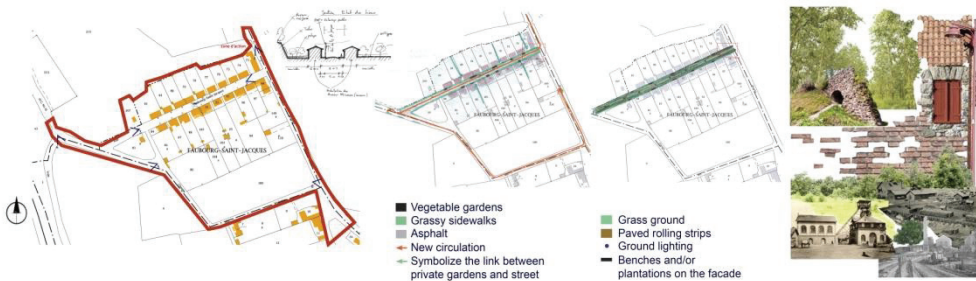


**Fig. 5.** Estimated development concepts: A. – ‘local route of industrial heritage’; B. – ‘summer camp’; C. – ‘festival event ground’.

### 3.2 Practical application of theoretical approaches

This section outlines how each of the principles is implemented within the architectural and urban planning project for the transformation of Lavaveix-les-Mines, as well as the specific steps envisaged to achieve the set goals. The outcome will be presented as a plan of successive transformations aimed at fostering urban development and improving the quality of life for the city's residents.

Principle of Integration of Industrial Heritage into the Urban Environment. This principle aims to preserve and efficiently utilize the rich historical heritage of the city in conjunction with modern urban infrastructure requirements. Within this project, the preservation and restoration of historical industrial sites are planned, along with their reconstruction and adaptation for new functional purposes. Thus, historical structures become integral parts of the urban environment, imbuing it with a unique character and transmitting the legacy of Lavaveix-les-Mines's industrial development (Fig. 6).



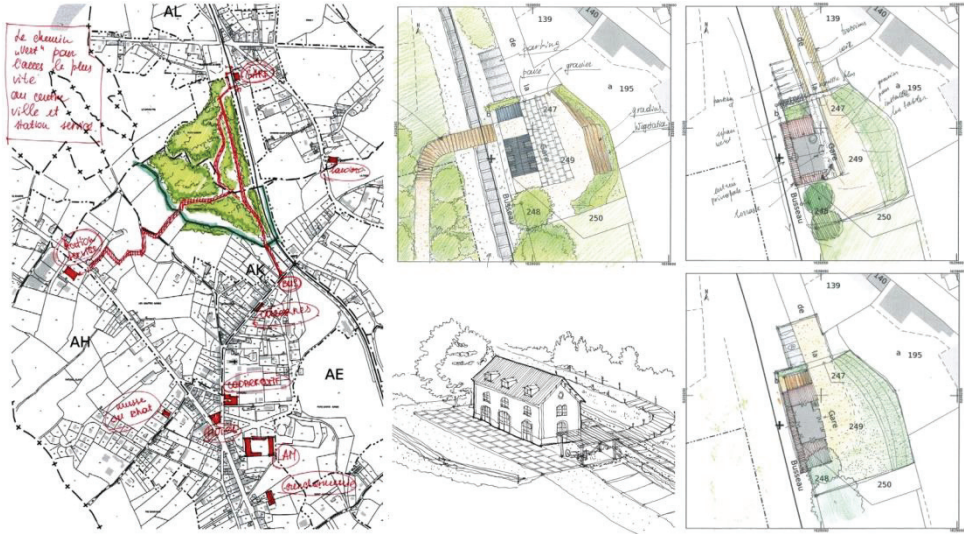
**Fig. 6.** Project of miner's cottages renovation: preservation of street identity (Faubourg St-Jacques) [15]

Principle of Creation of Spaces for Social Activity and Interaction. This principle aims not only to create places for communication and gatherings among local residents and visitors but also to foster the development of an active and inclusive community. It encompasses various aspects of public life, including cultural and sports events, educational programs, and other forms of social activity.

The research envisages the creation of unique public spaces that will promote social activity and interaction among different population groups. These spaces include parks and squares for relaxation and recreation, areas for cultural events and festivals, as well as community centres and art spaces for creative and intellectual development (Fig. 7, 8). Consideration is given to the inclusivity and accessibility of these spaces for various categories of people.

Empirically, the creation of such spaces not only contributes to the strengthening the social fabric of the urban environment but also fosters the development of a unique atmosphere, appealing to both local residents and tourists alike. These spaces will become

centers of life and cultural development in Lavaveix-les-Mines, inspiring and enriching its social and cultural spheres.



**Fig. 7.** Project of reconstruction of the railway station with the creation of a recreational area [15]

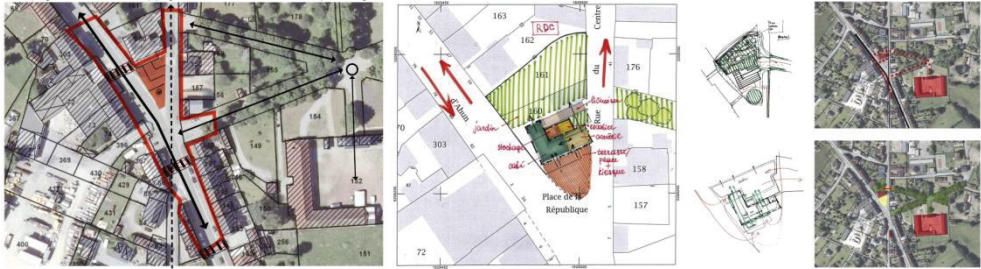
Principle of Promotion of industrial tourism as a development factor. Industrial tourism represents an important direction in the tourism industry, particularly in countries with rich industrial heritage such as France. As a relatively new field in tourism, industrial tourism holds significant potential for preserving the identity of small towns and stimulating their development. Historical industrial towns, once thriving due to their factories and industrial enterprises, now face the challenge of preserving their cultural and architectural uniqueness due to changing economic environments [24]. Industrial tourism can have a substantial impact on this process by utilizing the city's historical industrial heritage as an attractive resource for the tourism industry.

To achieve these goals, the project has developed tourist routes covering the main attractions of the city's industrial heritage. Attractions for tourists have been proposed, including industrial museums, thematic exhibition centres, art spaces, etc., as well as a service system: accommodation and infrastructure facilities (hotels, cafés, restaurants, parking lots, auto services, etc.).

These measures aim to create an attractive and convenient environment for tourists interested in exploring the history and culture of Lavaveix-les-Mines's industrial heritage, thereby promoting the development of industrial tourism in the region and strengthening its economic potential.

Principle of Promotion of cultural diversity through architectural techniques. The Lavaveix-les-Mines undoubtedly possesses a rich industrial heritage and historical roots, serving as a continuous source of self-identity and authenticity. However, preserving cultural diversity requires more than just conservation and restoration of historic buildings. It also necessitates active support in the development of local architectural styles, traditions, and crafts.

In the context of the renovation and development project of the industrial town of Lavaveix-les-Mines, the principle of 'Promoting Cultural Diversity through Architectural Practices' aims to create a harmonious and diverse urban space that reflects the richness of cultural heritage and contributes to its diversity. The use of architectural techniques and solutions to support and develop local architectural culture is a key element of the strategy for preserving and promoting the city's cultural heritage.



**Fig. 8.** Reconstruction project of the central square (Place de la République) [15]

Within the scope of the renovation and development project, this principle has been embodied through a series of specific initiatives and architectural solutions. Events aimed at promoting and enhancing local architectural culture, supporting indigenous architectural styles, traditions, and crafts were organized [15]. This included organizing master classes, exhibitions, and festivals where local architects, artists, and craftsmen shared their knowledge and experience with the community.

In this project solution, special attention was devoted to creating new architectural objects and spaces that would reflect the cultural diversity and richness of the city. New buildings and infrastructure were designed with consideration of historical context and local traditions, while incorporating modern architectural and engineering solutions.

The outcome of this research segment not only involves preserving and promoting the cultural diversity of the Lavaveix-les-Mines but also encompasses the development of a unique and appealing urban space.

The process of reorganizing and developing the small industrial town of Lavaveix-les-Mines embodies an approach based on preserving and restoring its historical and cultural heritage, as well as creating spaces for social activity and interaction. Thus, not only a plan of action for strengthening the social fabric of the local community is created, but also strategic directions for the development of the urban environment as a whole are determined.

Within this study, the strategic directions are:

- preservation of history with a focus on restoring and adaptively reusing historical industrial buildings, utilizing the city's industrial heritage as a cultural asset to attract tourists;
- multifunctional zoning for the development of a diverse urban environment, combining residential, commercial, and recreational spaces;
- pedestrian-oriented environment design: developing pedestrian-friendly infrastructure (wide sidewalks, pedestrian squares, and green areas);
- 'Smart growth' strategy in managing its expansion, involving compact development, preservation of natural landscapes, and agricultural areas around the city;
- community engagement in the planning process through public consultations, seminars, and participatory decision-making to ensure revitalization efforts reflect the needs of local residents;
- promotion of sustainable transportation options, such as bicycle infrastructure, improving public transportation, and electric vehicle charging stations.

For Lavaveix-les-Mines, the presented concept means restoring its prestige and attractiveness as a place where unique industrial heritage blends with modern urban development trends. For France, it means preserving its cultural and touristic potential not only for major cities with recognizable profiles but also for small communities, providing them with new opportunities for economic development and social integration. Ultimately, the story of Lavaveix-les-Mines serves as a reminder of the importance of preserving our roots, love for our homeland, a sense of belonging, and the aspiration to create a better future

for generations to come. It is a call for each of us to contribute to the preservation and development of unique places that make our world richer, more vibrant, and more fascinating.

## 4 Conclusions

1. During the research, a critical need to preserve the historical and cultural heritage of small industrial towns in France, such as Lavaveix-les-Mines, has been identified. These towns represent key elements of cultural heritage, serving as valuable sources for studying the past and appreciating the present. The process of globalization and economic changes often puts at risk the unique aspects of the culture and history of these places, making their preservation a crucial task for society as a whole. It is evident that these towns hold significance in safeguarding France's collective memory and cultural heritage.

2. Various research methods were employed during the study, including community engagement, extensive literature review, specialized ecological-urban planning techniques, and specific design methodologies. This multi-level approach ensured a comprehensive understanding of the current state of the city and its potential for development. The in-depth literature review allowed for the analysis of historical and socio-cultural aspects, as well as the examination of experiences from similar projects. Specialized ecological-urban planning techniques facilitated the assessment of the environmental conditions of the area and identified opportunities for improvement within the context of revitalization efforts. A specialized set of design methodologies were applied to develop the revitalization concept, taking into account the unique characteristics of the urban environment and the needs of Lavaveix-les-Mines's residents.

3. An important stage in the development of the revitalization concept for the Lavaveix-les-Mines was the application of theoretical principles, which serve as the foundation for shaping the development strategy. The formulated principles, such as the integration of industrial heritage into the urban environment, the creation of spaces for social activity and interaction, the promotion of industrial tourism, and the facilitation of cultural diversity through architectural practices, represent key directions that define the city's future. These principles not only acknowledge the city's historical and cultural heritage but also allow for its adaptation to modern conditions and the needs of the local community. By incorporating these principles into the development strategy, a harmonious blend of cultural heritage preservation with social and economic development of the city is ensured. Thus, the theoretical principles serve as the basis for creating a comprehensive and sustainable development strategy aimed at improving the quality of life for the local population and attracting external investments in urban infrastructure development.

4. The presented research, aimed at the revitalization process, is based on the methodology of integrated design, which involves a comprehensive approach to developing project solutions considering various aspects (architectural, social, economic, and cultural). A crucial and important stage of this methodology was the comprehensive interaction between different disciplines and specialists united by the common goal of creating a sustainable and harmonious urban environment.

The developed project solution for Lavaveix-les-Mines has the potential to play a key role in the city's development by preserving its historical heritage, stimulating social activities, and promoting economic growth. Such projects serve as a model for other small industrial cities facing similar challenges and tasks in the preservation of their heritage and development.

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