

From Fragmentation to Integration: Exploring Productive Urban-Rural Transition Zones in Richterich

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1. THEME

1.1 Urban Expansion in Aachen and Richterich

Urban expansion in Aachen has increasingly taken place in peripheral areas, where former villages such as Richterich have gradually become integrated into the city structure. These areas play an important role in accommodating future growth while balancing spatial quality and environmental considerations.

Richterich has gained relevance due to the ongoing discussion surrounding Richtericher Dell as one of Aachen's future residential development areas. Located at the interface between the urban fabric and the surrounding rural landscape, Richterich represents a strategic territory for exploring alternative approaches to urban expansion and spatial integration.

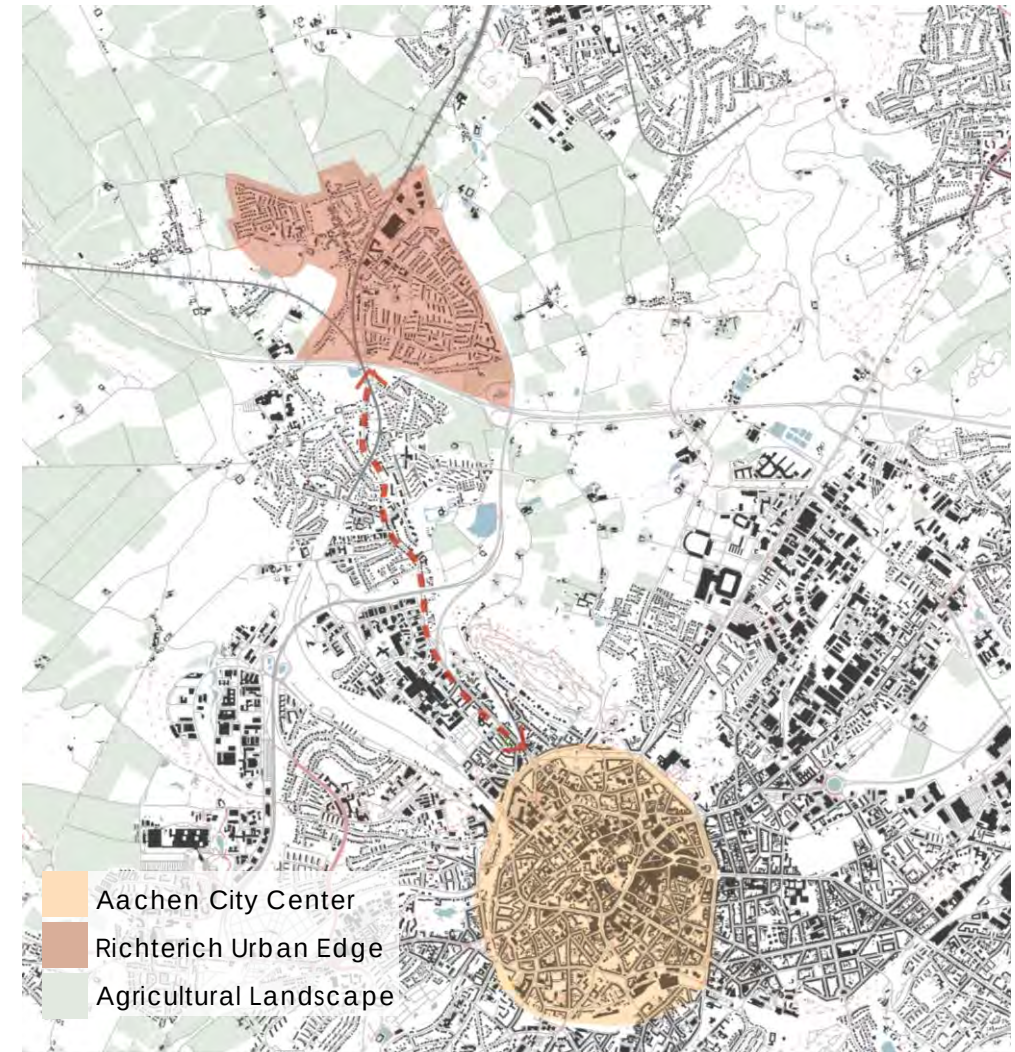


Figure 01. Territorial Context: Territorial relationship between Aachen, Richterich, and the surrounding agricultural landscape. Source: Author

1. THEME

Spatial Transformation of Richterich

Evolution from an agricultural settlement structure towards a fragmented suburban condition.

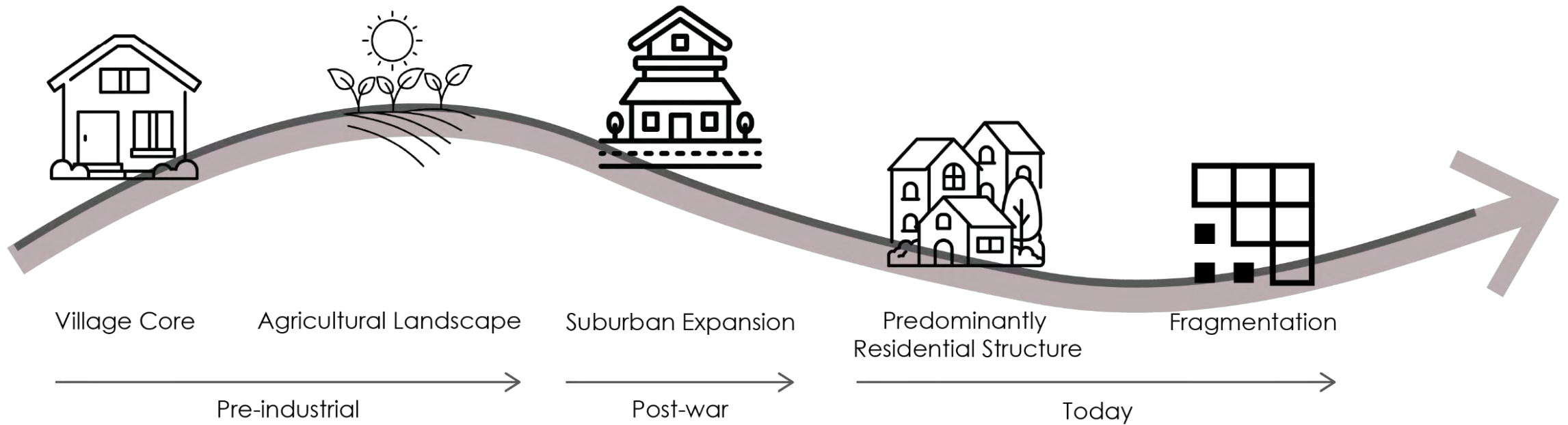


Figure 02. Historical Transformation of Richterich. Source: Author

1. THEME

1.2 Fragmentation and Loss of Rural–Urban Relationship

Richterich reflects typical suburban development patterns characterized by low-density housing and strong spatial separation between residential areas and the surrounding agricultural landscape.

Historically developed from a village structure closely connected to productive land, the district gradually shifted towards a predominantly residential function through suburban growth processes. As a result, residential areas, agricultural land, and infrastructure coexist but remain weakly integrated.

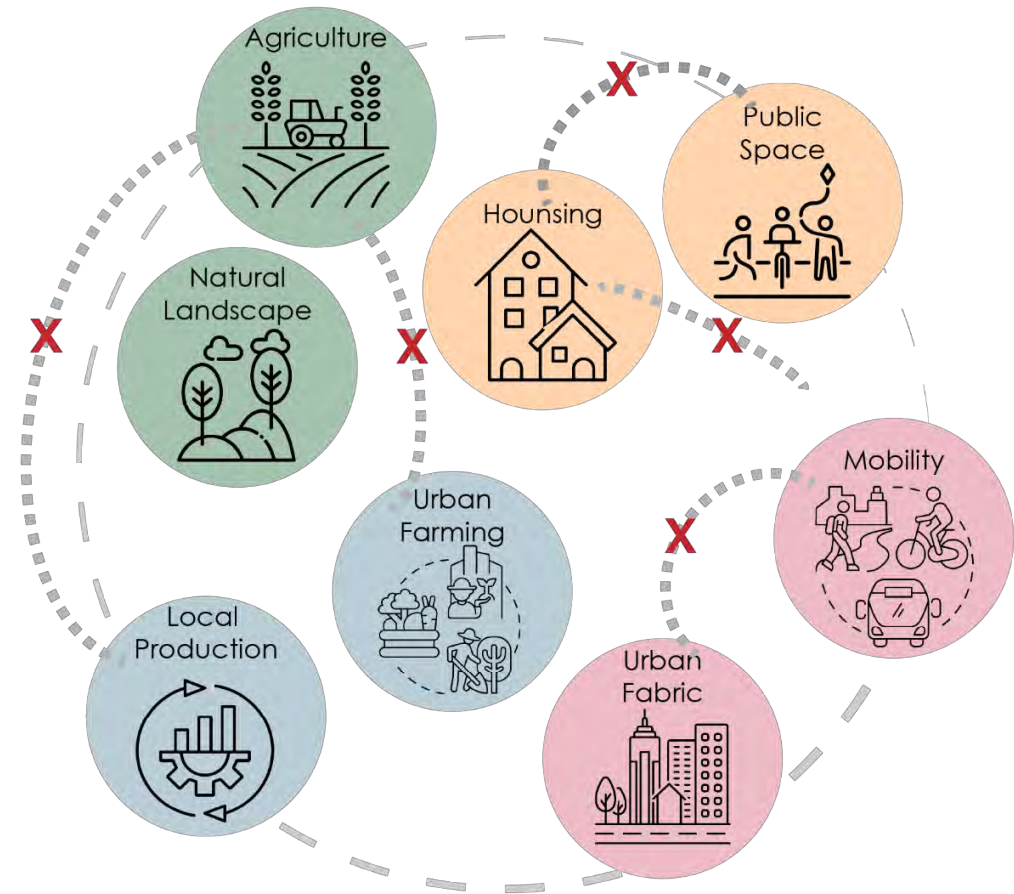
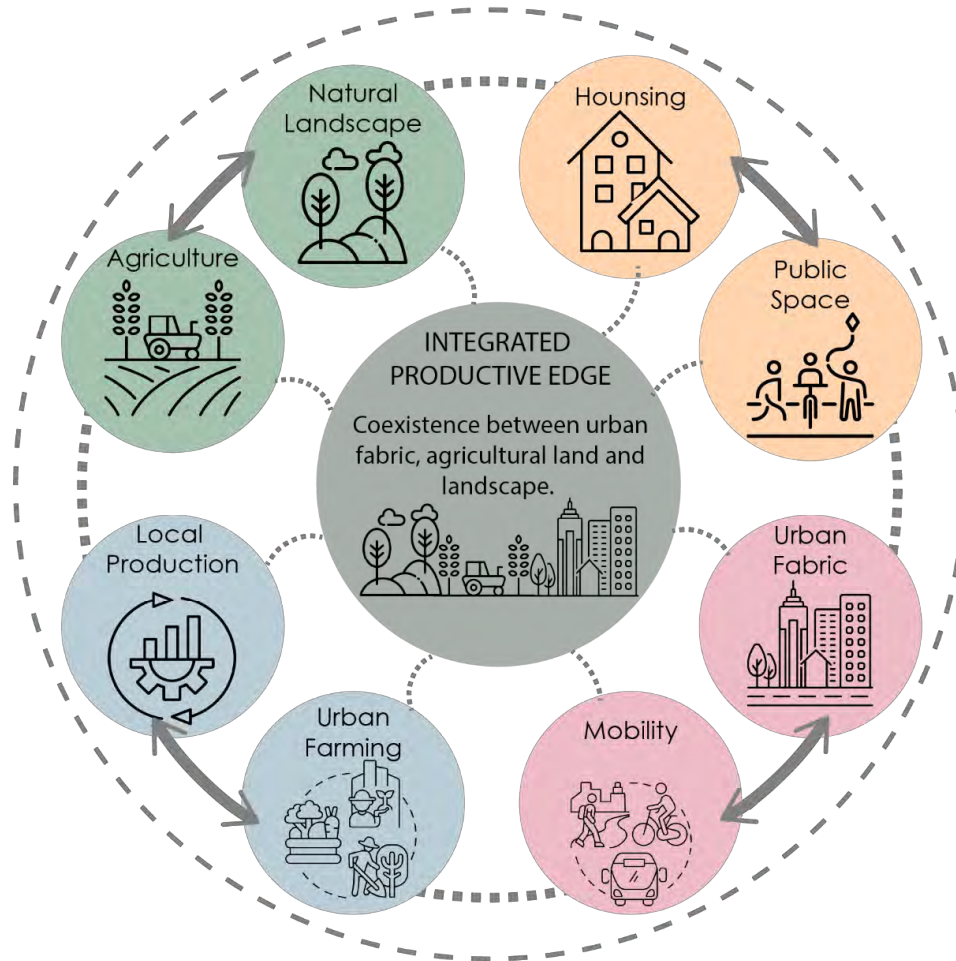


Figure 03. Current Fragmented Condition: Hard boundaries reduce connections between landscape, productive systems and urban fabric. Source: Author

1. THEME



1.3 Towards an Integrated Productive Edge

In response to these challenges, contemporary urban development approaches emphasize the transformation of urban edges into zones of integration rather than separation.

Concepts such as productive landscapes, circular systems, and socio-ecological integration aim to reconnect urban and rural systems while supporting sustainable development. These approaches are reflected in European policies promoting compact growth, ecological connectivity, and resilient urban structures.

Figure 04. Integrated Productive Edge: Soft boundaries support coexistence between urban fabric, productive systems and landscape. Source: Author

2. RESEARCH INTEREST



2. RESEARCH INTEREST

2.1 Definition

This research focuses on the relationship between residential areas and agricultural landscapes in Richterich, a suburban district located at the urban edge of Aachen. Although housing and productive land remain physically adjacent, contemporary suburban development has gradually weakened their spatial, social, and functional connections, resulting in fragmented land use patterns and limited interaction between urban and agricultural systems.

The research investigates how a more integrated relationship between housing, agriculture, public space, and infrastructure can contribute to a more coherent and multifunctional landscape structure. Rather than maintaining a clear separation between residential and productive areas, the study explores strategies that promote spatial continuity, everyday interaction, and shared use of space while preserving the productive and cultural value of the agricultural landscape.

Through a Research by Design approach, alternative spatial scenarios are developed and tested to explore how urban and agricultural systems can coexist within an integrated productive landscape.

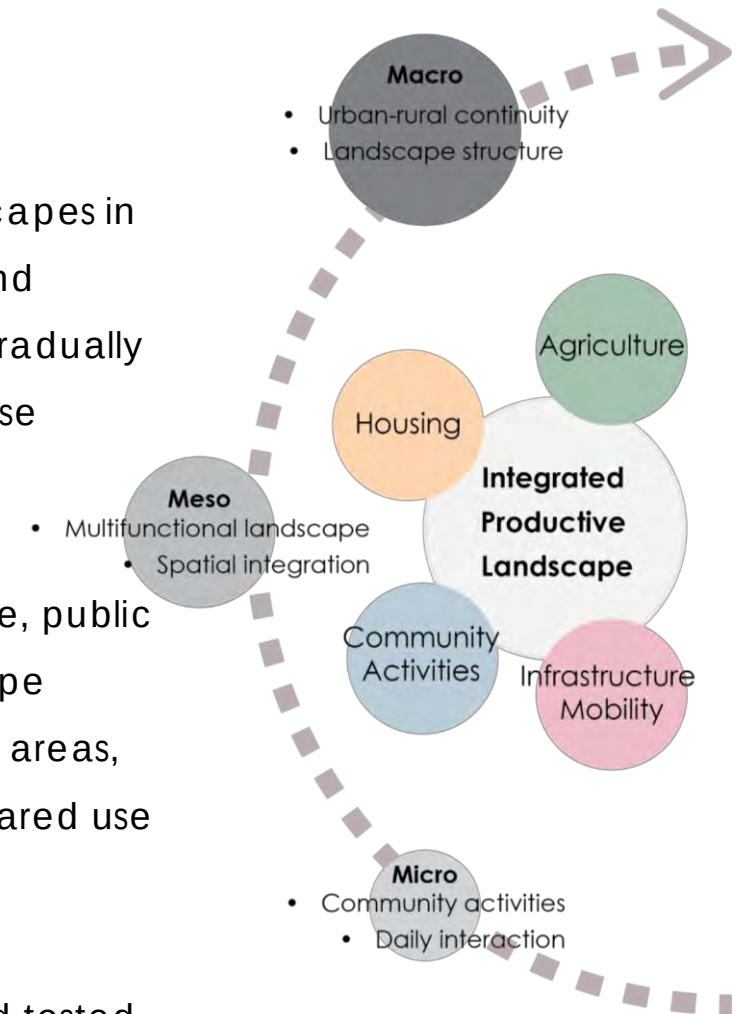


Figure 05. Integrated Productive Landscape: Multi-scalar strategies. Source: Author

2. RESEARCH INTEREST

2.2 Spatial and Territorial Analysis: Land Use Evolution

Despite suburban growth processes, Richterich has maintained a predominantly residential structure surrounded by agricultural land. The comparison between 1990 and 2018 indicates relatively limited changes in land-use patterns, with expansion occurring mainly at the urban edges.

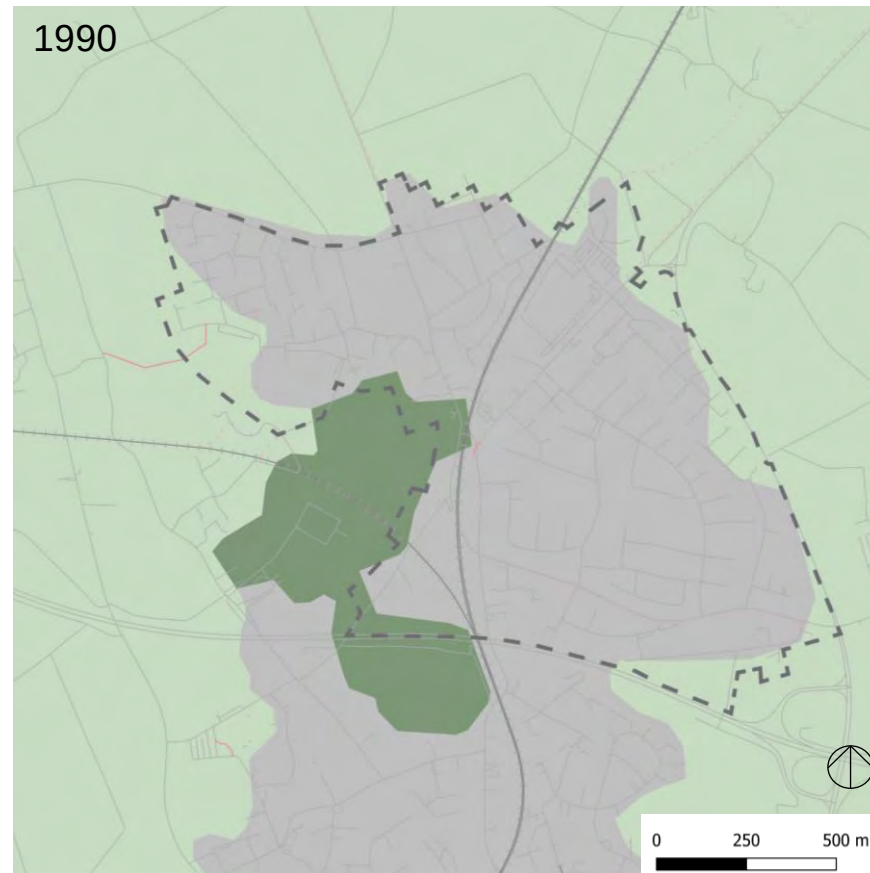
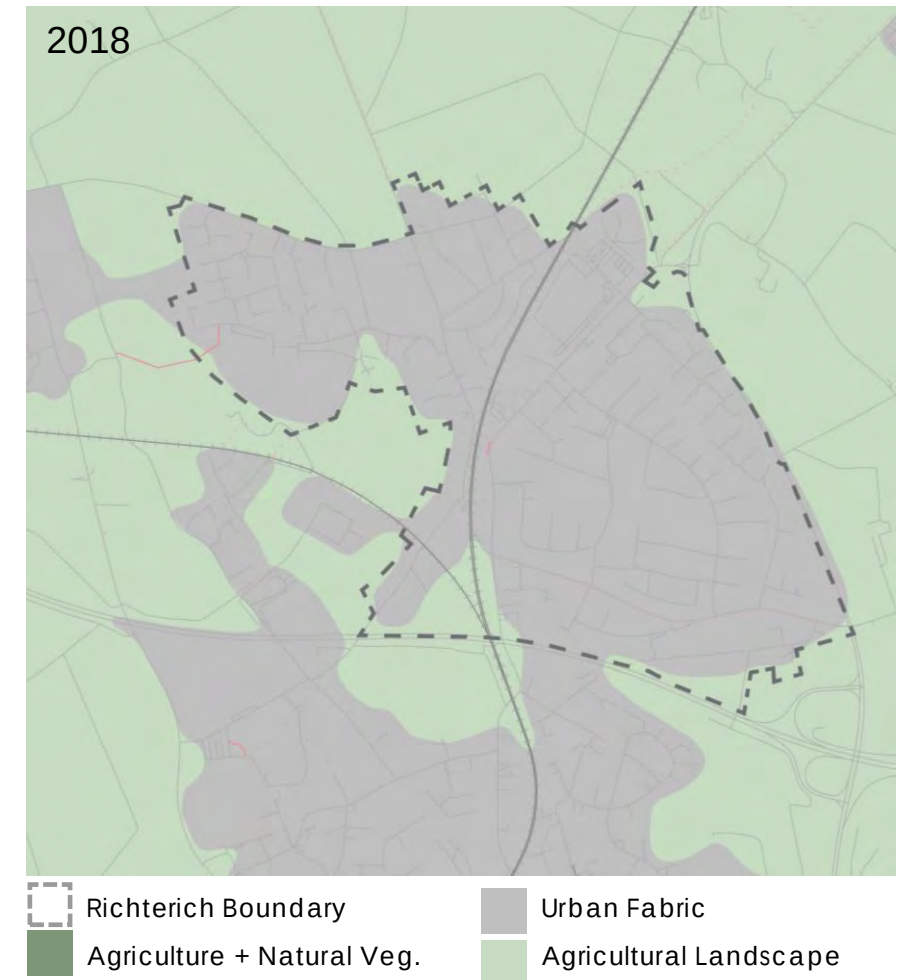


Figure 06-07. Land Use Evolution. Source: Copernicus Land Monitoring Service, edited by author in QGIS.



2. RESEARCH INTEREST

2.2 Spatial and Territorial Analysis: Urban Fabric and Agricultural Interface

The map shows Richterich as a predominantly residential district surrounded by extensive agricultural land.

The urban fabric remains clearly separated from the surrounding productive landscape, creating a distinct urban-rural edge condition.

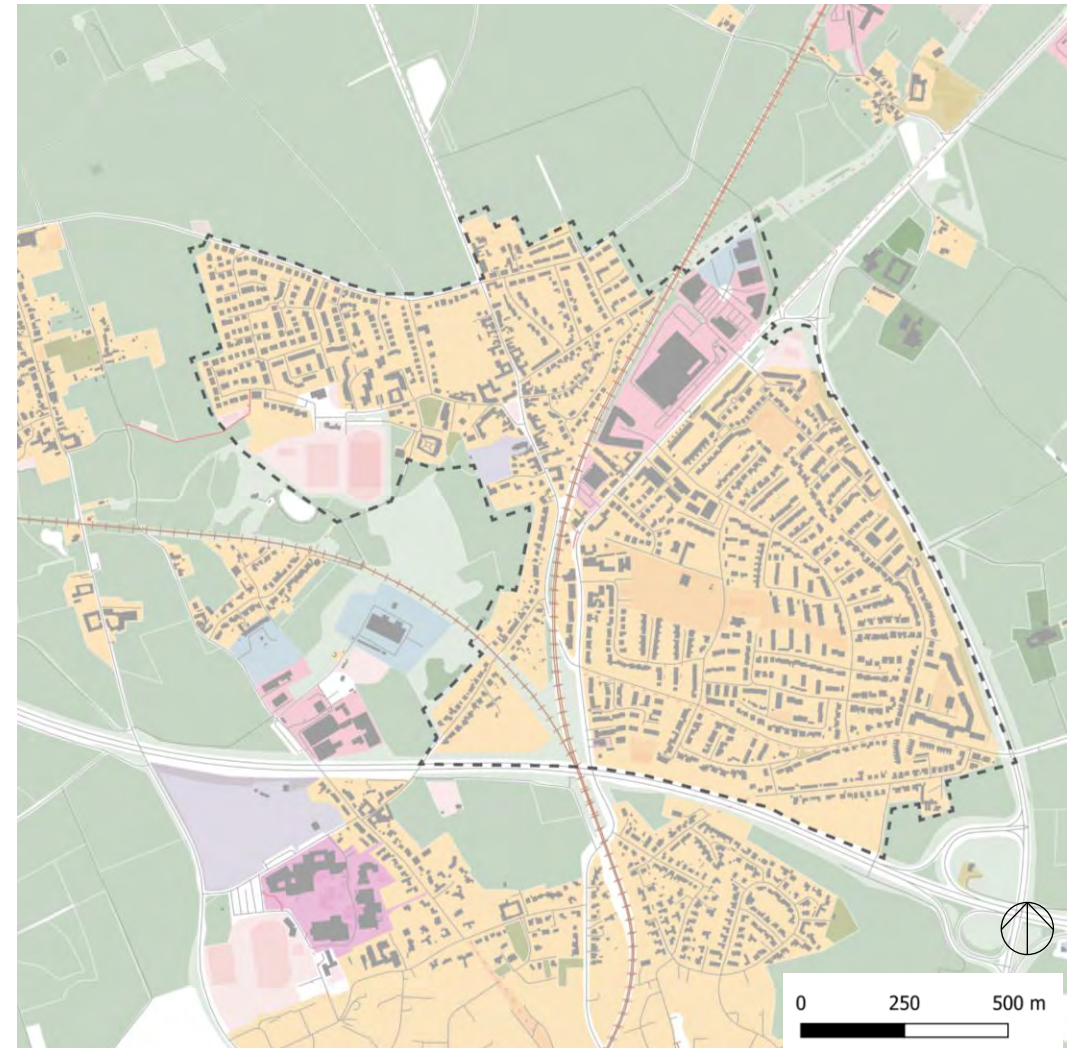


Figure 08. Land Use Map. Source: OpenStreetMap data, edited by author in QGIS.

2. RESEARCH INTEREST

2.2 Spatial and Territorial Analysis: Spatial Barriers and Fragmentation



The spatial structure of Richterich is strongly shaped by railway and highway infrastructure corridors.

These systems create physical barriers that interrupt spatial continuity between residential areas, agricultural land, and surrounding open landscapes, reinforcing the fragmented condition of the urban edge.

- Agriculture Landscape
- Railway
- Road Network
- Planned Road

Figure 09. Spatial Barriers and Fragmentation Map. Source: OpenStreetMap data, edited by author in QGIS.

2. RESEARCH INTEREST

2.3 Strategic Spatial Potentials

The analysis identifies strategic zones along the urban-rural edge of Richterich, where opportunities for spatial integration emerge between housing, productive landscapes, and infrastructure systems.

Key spatial potentials identified through the territorial analysis:

- Existing residential–agricultural interfaces
- Productive landscape structure
- Mobility and infrastructure networks
- Opportunities for socio-spatial integration
- Potential for multifunctional landscape development

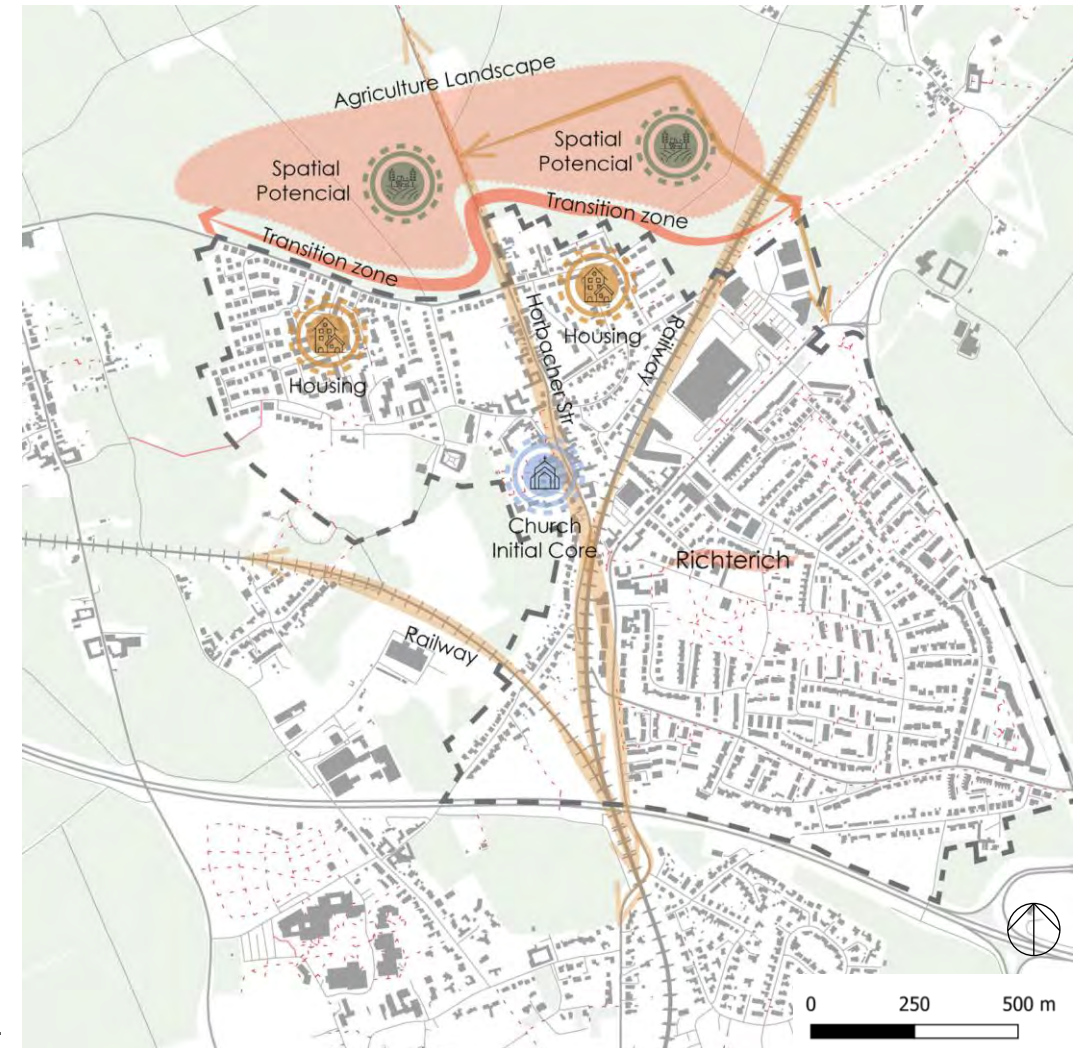


Figure 10. Strategic Spatial Potentials. Source: OpenStreetMap data edited by author.

2. RESEARCH INTEREST

2.4 Research Hypothesis

The current urban-rural condition in Richterich is characterized by a fragmented relationship between residential areas and agricultural landscapes, where physical proximity does not translate into spatial, social, or functional integration. This separation limits everyday interaction, reduces the potential for shared use of space, and weakens the overall coherence of the landscape. This research hypothesizes that this condition can be improved through a more integrated relationship between housing and agricultural landscapes. By strengthening connections between housing, agriculture, public space, and infrastructure, it is possible to create a multifunctional productive landscape that enhances spatial continuity, supports everyday interaction, and preserves the identity and productive character of the territory.

2. RESEARCH INTEREST

2.4 Research Question

How can housing and agricultural landscapes be spatially integrated to create a more connected and multifunctional urban-rural environment in Richterich?

Case study: Richterich, Aachen



3. METHODOLOGY



3. METHODOLOGY

3.1 Research Framework

This research follows a qualitative Research by Design approach, combining territorial analysis, spatial interpretation, and scenario testing. The methodology uses design as an exploratory tool to investigate how stronger relationships between housing, agriculture, public space, and infrastructure can contribute to a more integrated and multifunctional landscape in Richterich.

Based on the identification of existing challenges and spatial potentials, a research hypothesis is formulated and translated into a spatial vision. Alternative concepts are then developed and evaluated as scenarios to test different approaches to urban-rural integration. The selected concept is subsequently translated into an implementation framework and reflected upon in the final conclusion.

1. Territorial Analysis	2. Problems and Potentials	3. Vision Development	4. Concept Testing	5. Implementation Framework	6. Conclusion
Analyze the existing spatial structure of Richterich, focusing on land use, urban-rural relationships, infrastructure barriers, and spatial potentials.	Identify the main spatial challenges and opportunities shaping the urban-rural edge condition.	Define a desired future condition for a more integrated urban-rural relationship.	Develop and evaluate alternative spatial concepts as scenarios to test different approaches to urban-rural integration.	Organize the proposed strategies into short, medium, and long-term phases.	Reflect on how the proposed vision and strategies address the identified challenges and opportunities.

4. ANALYSIS & DISCUSSION: VISION AND CONCEPTS



4. ANALYSIS & DISCUSSION: VISION AND CONCEPTS

4.1 Vision

The vision for Richterich is to create an Integrated Productive Landscape where housing, agriculture, public spaces, infrastructure, community life, and everyday interaction are spatially integrated.

By strengthening connectivity, accessibility and shared productive spaces, the proposal transforms the current fragmented landscape into a multifunctional environment that supports productive activities, community life and everyday interaction while preserving the agricultural identity of the territory.



Figure 11. Illustrative representation of a future urban-rural landscape integrating housing, agriculture, public space, and infrastructure. Source: Author, generated with AI assistance.

Key Spatial Principles

- | | | |
|------------------------------------|------------------------|---------------------------|
| 1. Housing–Agriculture Integration | 3. Community Functions | 5. Agricultural Identity |
| 2. Productive Open Spaces | 4. Active Mobility | 6. Urban–Rural Continuity |

4. ANALYSIS & DISCUSSION: VISION AND CONCEPTS

4.1 Vision: Figure 11

Text prompt used for AI image generation:

Architectural isometric illustration of a future integrated productive landscape in Richterich, Aachen. Show a hybrid urban–rural environment where housing, agriculture, community gardens, public spaces, local markets, playgrounds, pedestrian and cycling routes coexist within a multifunctional productive landscape. Soft desaturated color palette, clean vector-like architectural linework, aerial isometric perspective, abundant vegetation, modern European residential architecture, people walking, cycling and interacting in public spaces, conceptual masterplan visualization.

4. ANALYSIS & DISCUSSION: VISION AND CONCEPTS

4.2 Concept Testing

To test the proposed vision, three alternative spatial concepts were developed. Each explores a different strategy for integrating housing, productive landscapes, public space, and infrastructure within the urban–rural context of Richterich.

The concepts represent varying degrees of productive land preservation, residential integration, and community-oriented functions, highlighting different spatial relationships.

Together, they provide design scenarios that support the comparative evaluation and the identification of the strategy that best fulfils the proposed vision of an Integrated Productive Landscape.

01. Agriculture Priority



Figure 12. Concept 01: Productive Landscape Framework. Source: Author, generated with AI assistance.

02. Housing + Agriculture



Figure 13. Concept 02: Hybrid Productive Landscape. Source: Author, generated with AI assistance.

03. Community Activation

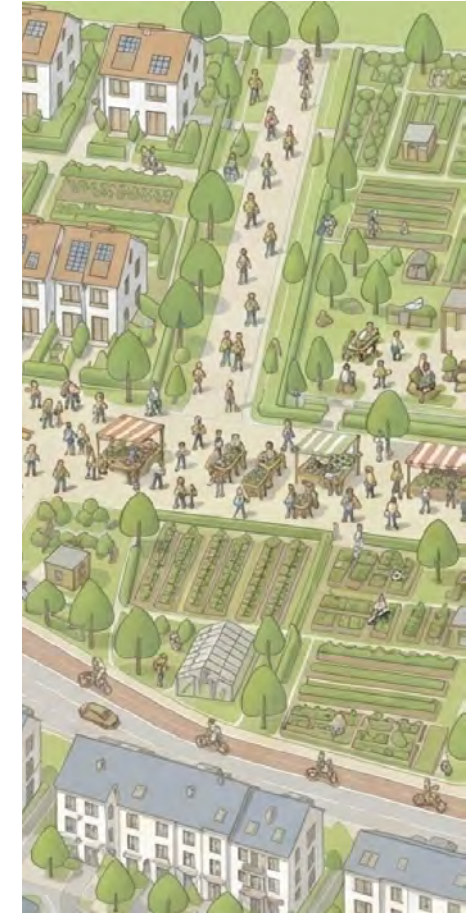


Figure 14. Concept 03: Community Productive Corridor. Source: Author, generated with AI assistance.

4. ANALYSIS & DISCUSSION: VISION AND CONCEPTS

4.1 Vision

Text prompt used for AI image generation:

Figure 12: Architectural isometric illustration of the Richterich development area in Aachen representing a Productive Landscape Framework. The agricultural landscape remains the dominant territorial structure, with large continuous crop fields defining the spatial organization. Residential development is limited to the edges of the productive landscape. A multifunctional buffer zone between housing and agriculture accommodates community gardens, allotment gardens (Schrebergärten), local markets, public open spaces, playgrounds, and active mobility routes. The illustration should emphasize the continuity of agricultural land while introducing complementary public functions. High-angle aerial isometric perspective, clean architectural linework, soft watercolor textures, muted palette of sage greens, warm beige, light grays, and terracotta roofs, populated with small human figures engaged in everyday activities.

Figure 13: Architectural isometric illustration of the Richterich development area in Aachen representing a Hybrid Productive Landscape. Housing, agriculture, and public space are spatially integrated within a balanced multifunctional landscape. Small residential clusters with modern European houses are dispersed throughout the productive landscape and connected by pedestrian paths, cycling routes, and shared public spaces. Agricultural land is fragmented into community gardens, productive

4. ANALYSIS & DISCUSSION: VISION AND CONCEPTS

4.1 Vision

Text prompt used for AI image generation:

fields, orchards, and greenhouses that coexist with housing and recreation. Public spaces, playgrounds, local markets, and active mobility infrastructure are embedded throughout the territory rather than concentrated in a single location. High-angle aerial isometric perspective, clean vector-like architectural linework, soft watercolor rendering, muted natural color palette, abundant vegetation, and human activity illustrating everyday interaction between living, production, and public life.

Figure 14: Architectural isometric illustration of the Richterich development area in Aachen representing a Community Productive Corridor. A continuous multifunctional public corridor connects the existing residential neighborhood with the productive landscape through a sequence of community-oriented spaces. The corridor integrates local markets, playgrounds, community gardens, educational agricultural spaces, outdoor gathering areas, shared seating, pedestrian promenades, and cycling routes, creating an active social spine across the territory. Agricultural land remains an important productive component while incorporating educational and recreational functions. High-angle aerial isometric perspective, clean architectural linework, soft watercolor textures, muted palette of sage greens, warm beige, light grays, and terracotta roofs, populated with people walking, cycling, gardening, learning, and participating in community activities.

4. ANALYSIS & DISCUSSION: VISION AND CONCEPTS

4.3 Concept 01: Productive Landscape Framework

This concept explores a landscape-led approach in which agriculture remains the dominant territorial structure of Richterich. The proposal strengthens the relationship between housing and productive land while preserving the continuity and identity of the agricultural landscape.

A buffer zone between residential areas and agricultural fields accommodates complementary functions such as community gardens, allotment gardens (Schrebergärten), local markets, and active mobility corridors. Residential development remains limited.

Figure 15. Conceptual visualization of the Productive Landscape Framework.
Source: Author, generated with AI assistance.



4. ANALYSIS & DISCUSSION: VISION AND CONCEPTS

4.3 Concept 01: Productive Landscape Framework

Text prompt used for AI image generation:

Figure 15: Architectural isometric illustration of the Richterich development area in Aachen representing a Productive Landscape Framework. The agricultural landscape remains the dominant territorial structure, with large continuous crop fields defining the spatial organization. Residential development is limited to the edges of the productive landscape. A multifunctional buffer zone between housing and agriculture accommodates community gardens, allotment gardens (Schrebergärten), local markets, public open spaces, playgrounds, and active mobility routes. The illustration should emphasize the continuity of agricultural land while introducing complementary public functions. High-angle aerial isometric perspective, clean architectural linework, soft watercolor textures, muted palette of sage greens, warm beige, light grays, and terracotta roofs, populated with small human figures engaged in everyday activities.

4. ANALYSIS & DISCUSSION: VISION AND CONCEPTS

4.3 Concept 01: Productive Landscape Framework



Key Issues:

- Agricultural landscape preservation
- Landscape continuity
- Limited housing integration
- Community-based productive spaces
- Active mobility connections

Figure 16: Conceptual Map of the Productive Landscape Framework. Source: Author.

4. ANALYSIS & DISCUSSION: VISION AND CONCEPTS

4.3 Concept 01: Productive Landscape Framework



Fig. 17: Productive Transition Zone. Source: Author, generated with AI assistance.



Fig. 18: Slow Mobility Corridor. Source: Author, generated with AI assistance.



Fig. 19 Railway Crossing. Source: Author, generated with AI assistance.

4. ANALYSIS & DISCUSSION: VISION AND CONCEPTS

4.3 Concept 01: Productive Landscape Framework

Text prompt used for AI image generation:

Figure 17: Human-scale architectural visualization of a productive transition zone between residential housing and agricultural land. Community gardens, allotment plots, local market stalls, pedestrian promenade, trees and planting create a gradual interface between housing and productive landscapes. Soft watercolor rendering, conceptual architectural illustration, calm atmosphere, European suburban context.

Figure 18: Perspective architectural illustration of a slow mobility corridor integrating pedestrians and cyclists between residential areas and agricultural landscapes. Wide pedestrian promenade, dedicated bicycle lane, tree-lined avenue, productive landscape on both sides, minimal vehicular traffic, clean architectural visualization with soft muted colors.

Figure 19: Architectural perspective showing an improved railway crossing integrated into a productive landscape. Safe pedestrian and cycling crossing, railway infrastructure, surrounding agricultural fields and residential neighborhood connected through green public space. Soft watercolor architectural style with muted colors and conceptual planning aesthetics.

4. ANALYSIS & DISCUSSION: VISION AND CONCEPTS

4.3 Concept 02: Hybrid Productive Landscape

This concept explores a balanced integration between housing, agriculture, and public space through a multifunctional productive landscape. Rather than maintaining a clear separation between residential areas and productive land, the proposal promotes a gradual coexistence of different uses within a shared territorial structure.

Housing is integrated into the agricultural landscape through dispersed residential clusters, community gardens, shared open spaces, and interconnected pedestrian and cycling routes. Enhanced railway crossings and mobility connections improve accessibility across the territory, creating a landscape where living, production, and everyday activities become complementary components of the same spatial system.

Figure 20. Conceptual visualization of the Hybrid Productive Landscape.
Source: Author, generated with AI assistance.



4. ANALYSIS & DISCUSSION: VISION AND CONCEPTS

4.3 Concept 02: Hybrid Productive Landscape

Text prompt used for AI image generation:

Figure 20: Architectural isometric illustration of the Richterich development area in Aachen representing a Hybrid Productive Landscape. Housing, agriculture, and public space are spatially integrated within a balanced multifunctional landscape. Small residential clusters with modern European houses are dispersed throughout the productive landscape and connected by pedestrian paths, cycling routes, and shared public spaces. Agricultural land is fragmented into community gardens, productive fields, orchards, and greenhouses that coexist with housing and recreation. Public spaces, playgrounds, local markets, and active mobility infrastructure are embedded throughout the territory rather than concentrated in a single location. High-angle aerial isometric perspective, clean vector-like architectural linework, soft watercolor rendering, muted natural color palette, abundant vegetation, and human activity illustrating everyday interaction between living, production, and public life.

4. ANALYSIS & DISCUSSION: VISION AND CONCEPTS

4.3 Concept 02: Hybrid Productive Landscape



Key Issues

- Housing-agriculture integration
- Multifunctional productive spaces
- Shared public spaces
- Active mobility connections

Figure 21: Conceptual Map of the Hybrid Productive Landscape. Source: Author.

4. ANALYSIS & DISCUSSION: VISION AND CONCEPTS

4.3 Concept 02: Hybrid Productive Landscape



Fig. 22: Housing + Agriculture. Source: Author, generated with AI assistance.



Fig. 23: Transition Zone. Source: Author, generated with AI assistance.

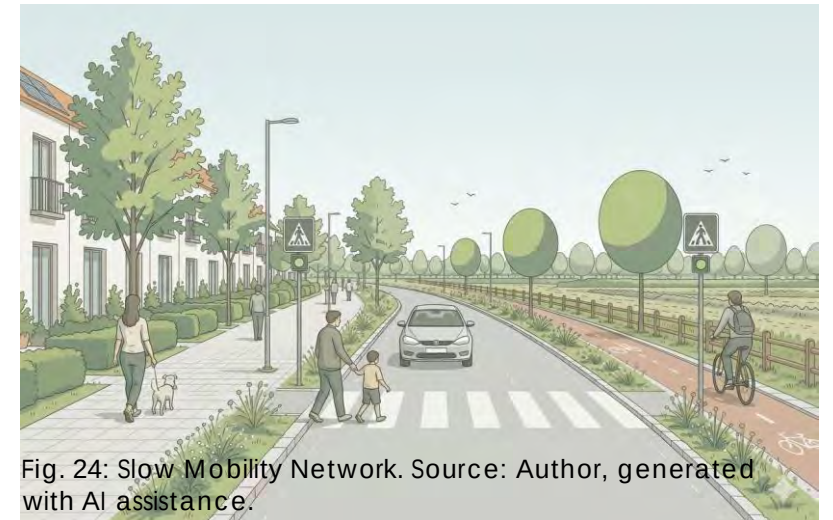


Fig. 24: Slow Mobility Network. Source: Author, generated with AI assistance.

4. ANALYSIS & DISCUSSION: VISION AND CONCEPTS

4.3 Concept 02: Hybrid Productive Landscape

Text prompt used for AI image generation:

Figure 22: Human-scale architectural visualization illustrating the coexistence of housing and productive agriculture. Small residential clusters embedded within community gardens, crop fields, greenhouses and shared productive spaces. Residents gardening, walking and interacting. Soft watercolor rendering, conceptual architectural illustration, European suburban context.

Figure 23: Architectural street-level visualization of a transition corridor between residential development and productive landscape. Tree-lined street, bicycle lane, productive gardens, public green spaces and housing integrated through a multifunctional landscape. Soft architectural watercolor style, conceptual urban design illustration.

Figure 24: Perspective illustration of a multimodal slow mobility network integrating walking and cycling through a productive landscape. Dedicated bicycle infrastructure, pedestrian promenade, trees, community gardens and residential areas connected by green public space. Architectural visualization with soft muted colors.

4. ANALYSIS & DISCUSSION: VISION AND CONCEPTS

4.3 Concept 03: Community Productive Corridor

This concept establishes a community productive corridor that connects the existing residential neighbourhood with the new hybrid productive landscape. Rather than acting as a transition zone, the corridor forms a continuous public network integrating local markets, community gardens, playgrounds, shared spaces, and areas for community events.

Promenades, cycling routes, and pedestrian paths structure the corridor and extend into the hybrid area, creating smaller public connections that weave together housing, productive landscapes, and open spaces. Productive landscapes remain a key component of the territory while also supporting recreation, education, and everyday social interaction within an interconnected public landscape.

Figure 25. Conceptual visualization of the Community Productive Corridor.
Source: Author, generated with AI assistance.



4. ANALYSIS & DISCUSSION: VISION AND CONCEPTS

4.3 Concept 03: Community Productive Corridor

Text prompt used for AI image generation:

Figure 25: Architectural isometric illustration of the Richterich development area in Aachen representing a Community Productive Corridor. A continuous multifunctional public corridor connects the existing residential neighborhood with the productive landscape through a sequence of community-oriented spaces. The corridor integrates local markets, playgrounds, community gardens, educational agricultural spaces, outdoor gathering areas, shared seating, pedestrian promenades, and cycling routes, creating an active social spine across the territory. Agricultural land remains an important productive component while incorporating educational and recreational functions. High-angle aerial isometric perspective, clean architectural linework, soft watercolor textures, muted palette of sage greens, warm beige, light grays, and terracotta roofs, populated with people walking, cycling, gardening, learning, and participating in community activities.

4. ANALYSIS & DISCUSSION: VISION AND CONCEPTS

4.3 Concept 03: Community Productive Corridor



Key Issues

- Community interaction
- Educational and social functions
- Productive public spaces
- Connectivity and Active Mobility

Figure 26: Conceptual Map of the Community Productive Corridor. Source: Author.

4. ANALYSIS & DISCUSSION: VISION AND CONCEPTS

4.3 Concept 03: Community Productive Corridor



Fig. 27: Community Productive Corridor. Source: Author, generated with AI assistance.



Fig. 28 Community Productive Corridor. Source: Author, generated with AI assistance.



Fig. 29: Agricultural Learning Space. Source: Author, generated with AI assistance.

4. ANALYSIS & DISCUSSION: VISION AND CONCEPTS

4.3 Concept 03: Community Productive Corridor

Text prompt used for AI image generation:

Figure 27: Human-scale visualization of a community productive corridor. Wide pedestrian promenade with local markets, community gardens, educational agriculture, gathering spaces, playgrounds, seating areas and cycling infrastructure integrated into productive landscapes. Active public life, soft architectural watercolor rendering, European urban-rural context.

Figure 28: Perspective architectural illustration of a productive public corridor emphasizing community gardens, local food production, pedestrian activity, cycling and social interaction within a multifunctional productive landscape. Soft desaturated colors, conceptual architectural visualization.

Figure 29: Architectural visualization of an outdoor agricultural learning space within a productive landscape. Community members participating in agroecology workshops, educational pavilion, demonstration gardens, raised beds and productive fields. Human-centered landscape design, soft watercolor architectural rendering, conceptual planning illustration.

4. ANALYSIS & DISCUSSION: VISION AND CONCEPTS

4.4 Implementation Framework

Although the three concepts propose different spatial configurations, they share a common implementation logic. The transformation of Richterich's urban-rural edge can occur progressively through mobility improvements, transition spaces, productive activities, and long-term landscape integration.



5. CONCLUSION



5. CONCLUSION

5.1 Concept Evaluation

The concept testing demonstrated that different spatial configurations generate different relationships between housing, agriculture, public space, and infrastructure. Each concept revealed distinct strengths and limitations regarding spatial integration, productive land preservation, accessibility, and community interaction.

The comparative evaluation confirmed that productive landscapes should be understood as multifunctional systems integrating ecological, social, and urban functions, providing the basis for selecting the most suitable design strategy.

Concept 01:
Productive Landscape Framework



Concept 02:
Hybrid Productive Landscape



Concept 03:
Community Productive
Corridor



5. CONCLUSION

5.2 Comparative Evaluation

The evaluation criteria were derived directly from the research hypothesis and vision, assessing how effectively each concept integrates housing, productive landscapes, public space, and infrastructure while preserving the agricultural identity of the territory.

Evaluation Criteria	Concept 01: Productive Landscape Framework	Concept 02: Hybrid Productive Landscape	Concept 03: Hybrid Productive Landscape
Agricultural identity			
Housing integration			
Public space quality			
Spatial connectivity			
Community integration			
Overall balance			

Key Findings

- Concept 01 prioritises agricultural preservation.
- Concept 02 achieves the strongest balance between housing, agriculture and public space.
- Concept 03 reinforces community life through a dedicated public corridor.

Strong

Moderate

Limited

Weak

5. CONCLUSION

5.3 Concept Selection

The comparative evaluation identified Concept 02 – Hybrid Productive Landscape as the strategy that best addresses the research objectives. It provides the strongest balance between housing, productive landscapes, public spaces, and active mobility, integrating these elements within a coherent spatial system rather than treating them as separate functions.

Compared with Concept 01, it achieves a higher degree of spatial integration while preserving the productive identity of the territory. Compared with Concept 03, it incorporates community interaction as an inherent characteristic of the landscape structure instead of concentrating activities within a dedicated public corridor.

For these reasons, Concept 02 was selected as the preferred design strategy. It provides the most coherent framework for transforming Richterich's fragmented urban–rural edge into an integrated productive landscape that combines agricultural continuity, residential development, public space, and everyday community life.

6. REFERENCES

6. REFERENCES

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AI-GENERATED VISUALIZATIONS

- AI-generated visualizations (Figures 11; 15; 17; 18; 19; 20; 22; 23; 24; 25; 27; 28; 29.) were created using a text-to-image generative AI model based on prompts developed by the author. The resulting images were subsequently selected and edited for conceptual representation.