Parkification of Post-Industrial Sites: A Catalyst for Greenway Development in Ruseifa, Jordan

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Abstract

This study explores three distinct parkification projects in Ruseifa city, Jordan, which were initiated simultaneously in 2020. These innovative projects aimed to transform three post-industrial sites into urban parks, addressing environmental, ecological, and social challenges associated with these sites.

Rather than focusing solely on the parks themselves, the study examines the parkification process and its unique characteristics at these sites, events, and key actors involved in their transformation. By investigating these processes, the study emphasizes the potential of these projects as incubators for greenway development and environmental sustainability in the region. The proximity of these sites to one another forms a foundational step toward the development of an integrated greenway system in Ruseifa city. The study explores the role of parkification as a strategic approach for promoting greenway development, uncovering the series of landscape transformation that was led by the parkification projects that ultimately connects all three parks into a greenway.

Through a comparative analysis of these projects, the research utilizes semi-structured interviews with key decision-makers and stakeholders, alongside content analysis of relevant documents, reports, and policies. A series of transformation maps is developed to visually represent how parkification has contributed to the creation of a greenway network. The findings emphasize the decision-making processes and the key factors that influenced the selection and implementation of parkification strategies.

The three distinct parkification processes of the Pepsi Pond site, the phosphate ore landfill site, and the old phosphate mine site were not initially conceived with parkification in mind. However, the resulting parks have fostered a broader vision of green infrastructure, promoting further greening projects, neighborhood enhancements, and streetscape improvements. These efforts have laid the foundation for a greenway project that connects natural and recreational spaces, enhancing urban connectivity.

Key factors promoting these projects include the uniqueness of the post-industrial sites, landownership conditions, the proximity of the sites to one another, and community support for these initiatives. This study not only contributes to the broader discourse on landscape transformation but also provides insights into strategic approaches for greenway development, community engagement, and environmental sustainability in Ruseifa and similar urban contexts.

Introduction

Parkification—the transformation of degraded or underutilized urban spaces into parks and green spaces, has become a strategic tool for addressing environmental, ecological, and social challenges in cities, particularly those with a post-industrial heritage.

The transformation of post-industrial landscapes into public parks has become a significant trend in urban planning, driven by increasing ecological awareness and a commitment to sustainability. Since the 1980s, landscape architects have repurposed former industrial sites, including old mining areas, abandoned factories, and neglected urban spaces, into thriving parks and greenways. Notable projects such as the High Line in New York and Duisburg Nord Landscape Park in Germany have set important precedents for such transformations and have successfully integrated environmental restoration with public space design, creating new green corridors that connect urban areas. These projects exemplify the concept of "parkification," where post-industrial sites are not only rehabilitated but transformed into spaces that foster environmental resilience and community engagement (Fabris & Li 2023).

On the other hand, Greenways are recognized as vital connectors that link fragmented open spaces and promote cohesive urban ecosystems. Charles Little's seminal work, Greenways for America (1995), outlines their role in connecting natural and recreational areas, fostering ecological corridors, and creating seamless pedestrian and cycling pathways. In the context of post-industrial landscapes, greenways serve as connective tissue that integrates isolated urban parks into a network of accessible public spaces. This approach not only maximizes the utility of individual parks but also enhances urban mobility, biodiversity, and quality of life.

The concept of proximity is central to greenways in post-industrial contexts, as these projects often occur within dense urban fabrics. Scholars like Fabos (2004) and Ahern (1995) argue that well-designed greenways provide a critical function by linking nodes of open spaces within walkable distances, fostering an interconnected urban experience. This is particularly relevant in cities reclaiming former industrial sites, where individual parks, when connected, create a larger network that promotes ecological restoration, social cohesion, and economic revitalization.

The parkification of post-industrial sites, when integrated into a greenway network, emphasizes the interplay between connectivity and place-making. Rather than treating parks as isolated interventions, greenways create a sense of continuity and identity across urban landscapes. By aligning with sustainable transportation and urban planning principles, these projects also address broader goals of climate resilience and equity. The literature suggests that this networked approach is key to reimagining post-industrial sites as vibrant, accessible, and sustainable public realms.

This paper explores the parkification projects as incubators for greenway project, navigating its impact on its surrounding sites as disturbed area towards its development into connected open and green spaces. This paper takes Ruseifa city, Jordan, as a case study to show this potential where three distinct post-industrial sites were transformed into urban parks between 2020 and 2023. These sites, once abandoned or heavily industrialized, have been reimagined as urban parks designed to address the multifaceted challenges facing the city due to the long-lasting industry and community need.

Ruseifa city, a hub for phosphate mining industry in Jordan, has experienced significant urbanization and industrialization, leading to environmental degradation, lack of green spaces, and a fragmented urban fabric in a highest densely populated city with limited areas for expansion. The three parkification projects in Ruseifa—initiated simultaneously in 2020—targeted post-industrial sites, including the Pepsi Pond, the phosphate ore landfill, and the old phosphate mine.

These projects represent an unprecedented approach in Jordan for post-industrial site

redevelopment. They are not just a response to environmental degradation but were later part of a larger strategy to reintroduce green spaces and public parks to the city of Ruseifa, which has long suffered from a lack of urban green infrastructure. The transformation of these sites into parks reflects a significant shift in the city's urban planning strategy, emphasizing environmental sustainability, community engagement, and the preservation of industrial heritage. The parkification of these areas offers a model for other post-industrial regions, demonstrating how the legacies of industrialization can be reimagined in ways that benefit both the environment and local communities.

While the parks themselves have been central to the city's green infrastructure plans, the primary focus of this study is to examine the parkification process itself—the series of events, decisions, and actors involved in transforming these sites from industrial wastelands into urban parks.

This approach allows for a deeper understanding of the factors that drive parkification, the unique characteristics of each site, and the broader implications for the development of greenways and sustainable urban systems in Ruseifa.By examining the decision-making processes and key factors influencing parkification, it has guided this research to explore how parkification of post-industrial landscapes can be a catalyst for greenway development in Jordan.

Ruseifa city and Study areas

As a result of the cessation of phosphate mining and environmental problems, numerous post-industrial sites emerged throughout the city, particularly in the urban center and southeastern areas. These sites, often abandoned and left unmanaged, have faced significant degradation due to a lack of a cohesive strategy for their redevelopment. The absence of planning has led to a range of environmental and social issues, including land erosion, displacement, and the overall decline in the aesthetic and functional quality of the city. These neglected sites have negatively impacted the urban environment and social fabric, contributing to diminished quality of life for residents.

Unlike other Jordanian cities, Ruseifa's post-industrial sites are interconnected, creating a unified historical landscape of phosphate mining industry. This network of industrial remnants provides a tangible narrative of Ruseifa's industrial past, and while these sites have brought with them considerable challenges, they are an important part of the city's industrial heritage. As such, these sites should not only be recognized for their historical significance but also for their potential in future urban regeneration efforts (AlRayyan et al., 2019; M. Jamhawi et al., 2021; Jarrar & Jaradat, 2022; Obeidat & Miqdady, 2021).

The three post-industrial sites selected for parkification in this study are located within approximately 0.5 miles of each other, as shown in Figure 1. Despite their degradation, these sites share a common industrial legacy that has had lasting effects on the city's landscape and environment. Their transformation into parks is not only an attempt to mitigate the negative impacts of past industrial activities but also serves as a catalyst for broader urban renewal. The initial stages of their transformation have already had a significant impact on the city's landscape, environmental context, and the satisfaction of local residents, extending well beyond the cessation of industrial operations. The three selected sites include:

Figure 1. Site map for the three selected post-industrial sites in Ruseifa City, Jordan. Site 1: Pepsi Pond; Site 2: Phosphate Ore Hills; Site 3: Phosphate Old Mines & Administration Building. Source: Author, 2023.

Site 1 – The Pepsi Pond Site: This site is a lagoon formed by the blockage of natural water flow due to the accumulation of phosphate waste, which affected the Zarqa River. The lagoon, once used by the Pepsi factory for bottle cleaning and as a dumping ground for industrial waste, has long been an environmental concern. The parkification project for this site is envisioned as the second phase of a larger restoration initiative, aimed at revitalizing the natural wadi and lagoon area. This transformation seeks not only to restore the natural flow of water but also to reintroduce ecological balance to the area, turning it into a public park that serves both environmental and recreational purposes.

Site 2 – The Phosphate Ore Hills Site: Located in the heart of Ruseifa, southeast of the Zarqa River, the Phosphate Ore Hills is an extensive post-industrial site characterized by a vast landfill of phosphate waste. The site contained over 7 million cubic meters of ore pills and waste, which have accumulated to form hills reaching up to 30 meters in height. These massive mounds of phosphate waste have become a defining feature of Ruseifa's landscape. This site spans a total area of 1795 dunums (179.5 hectares), with approximately 75 dunums (7.5 hectares) being transformed into an Environmental Park. The ongoing rehabilitation project aims to restore the original ground level prior to mining activities, undertaking significant soil remediation efforts. The phosphate hills have been relocated, and all open mine pits have been covered, effectively erasing the visible remnants of mining operations. The project also incorporates an afforestation strategy, with the parkification project being a central element of this transformation.

Site 3 – The Phosphate Old Mines Site: Located in the northern part of the phosphate company's concession area, north of the Hijazi railway line and south of the Islamic cemetery. This site serves as a living testament to the early days of phosphate mining, preserving manual mining tunnels and various structures integral to the industry's rich history. It was proposed to be transformed into a Geo-Heritage Park. The primary goal of this parkification project is to preserve the site's industrial heritage, including its architectural features such as the silo, water tower, and old mines openings dating back to the 1930s.

Method

This study employs a mixed-methods approach, combining semi-structured interviews with key decision-makers and content analysis of relevant documents, reports, and policies associated with each parkification project. This dual approach allows for a comprehensive understanding of the decision-making processes underpinning these urban transformation projects.

A total of 22 semi-structured interviews were conducted with a range of stakeholders, including immediate decision-makers, urban planning experts, and community representatives. These interviews were designed to capture a broad spectrum of perspectives on the parkification projects. A follow-up round of data collection was conducted after the completion of the parks to assess post-project impacts and gather additional insights

Data Analysis

As a result of the data collection, a series of maps were developed to illustrate the landscape transformations associated with the parkification projects, including the changes to the post-industrial parks themselves and the broader transformations in the adjacent areas. These maps trace the decision-making processes that followed the parkification projects, with particular focus on how the parks were integrated into a broader greenway initiative.

By analyzing the interplay between parkification and greenway development, the study investigates how the parkification processes at three distinct post-industrial sites in Ruseifa have contributed to the creation of an integrated greenway network, testing the hypothesis that these projects have influenced subsequent decisions regarding afforestation and greenway corridors.

Key Drivers and Outcomes of Parkification Projects

Ripple effect of Greening and afforestation

Between 2020 and 2022, the three post-industrial sites in Ruseifa underwent significant transformations due to the parkification projects, despite several challenges. A key development was the evolution of three parkification projects into a connected greenway in Ruseifa. The Pepsi Pond project (Site 1) initially aimed to restore water flow through the pond via an underground tunnel. luckily, due to funding conditions, the Greater Amman Municipality (GAM) were directed to convert the site into a park, linking it to the nearby Al Farah Park, as shown in map 1 & 2 in Table 1. In order to implement the tunnel GAM has used the adjacent sites to do such and because it was disturbed, the rehabilitation and greening expanded towards site 2.

The rehabilitation of Site 2, which began in 2012 with the goal of creating a public park, directly inspired expanded greening and afforestation efforts. As the park was developed in 2023, the municipalities of Ruseifa and Greater Amman Municipality, along with local stakeholders, extended plantings around the park and prepared for future expansion (Maps 3-5) in Table 1. This afforestation effort extended across larger areas of the rehabilitated site, reinforcing the role of parkification in fostering long-term environmental stewardship and sustainable urban development. The afforestation unfolded in four stages, showcasing the potential for scaling up ecological restoration.

Although Site 3 see as urgent a need for parkification due to its heritage significance, the change

in project leadership has delayed the construction of a geo-heritage park. However, due to its proximity to the tunnel's opening from site 1 towards Zarqa River, more attention has shifted to its development, especially regarding the restoration of riverbanks and the reclamation of adjacent agricultural lands and open spaces.

The parkification projects sparked a ripple effect, extending greening and afforestation initiatives across Ruseifa. These efforts contributed to urban resilience, improved community well-being, and strengthened ecological corridors. The projects also fostered collaboration between the Greater Amman Municipality (GAM), the Ruseifa Municipality, the Ministry of Local Administration, and the Ministry of Agriculture, creating a multi-stakeholder approach to sustainable urban development. In addition, addressing environmental issues, such as relocating the livestock market and rehabilitating the surrounding Al-Fakhoura Neighborhood, highlighted the broader impact of these parkification efforts on urban regeneration and quality of life for local residents.

A key outcome was the shift from focusing on individual parks to a more integrated landscape planning approach. This was exemplified by the proposed reclamation of the Pepsi Pond site, where stakeholders began exploring ways to restore natural water flows and convert the degraded area into a public open space. This initiative not only addressed water management challenges but also promoted urban connectivity and resilience, showcasing how these sites can function as testing grounds for scaling up innovative restoration strategies. Also, the project of the tunnel has been passing the three sites all along, making it essential to connect. By utilizing the ecological and social benefits of the initial parkification efforts, the phasing of greening projects around Site 2 showcases how these sites can function as laboratories for testing and scaling up innovative restoration strategies.

proximity of sites leading towards connectivity

The physical proximity of the three sites has been a key factor in facilitating the development of a connected greenway network. Located near each other, the sites allowed for shared infrastructure and interdependent development. This is particularly evident at Site 1, where operations at Site 3 played a critical role in the success of a larger, interconnected project.

At Site 1, GAM leveraged the proximity of Site 3 during a crucial phase. To construct a tunnel for an underground water system, GAM utilized innovative tunneling techniques that required digging through Site 3. This integration of infrastructure across sites highlights the value of proximity in streamlining project execution.

Furthermore, the closeness of the sites prompted the Ruseifa municipality to improve the streetscape along the main road connecting the three areas, as increased park usage by the public made the area more active. The rehabilitation of Site 2, particularly the closure of the phosphate mine, also benefited the surrounding parks by opening up views and encouraging stakeholders to enhance the area. The greening of Site 2 positively impacted both Site 1 and Site 2, creating a more cohesive environmental space.

The close spatial arrangement of these sites enabled the seamless integration of green infrastructure elements, such as the micro-tunnel running beneath all three sites. Originally implemented to restore water flow, the tunnel further underscores the interconnectedness of the sites and highlights the importance of considering physical proximity when planning urban greenways.

Role of Post-industrial Sites in Urban Regeneration

The nature of post-industrial sites, often characterized by contamination and physical disturbance, played a significant role in the decision to transform these areas into parks and green infrastructure rather than pursuing other forms of urban development. These sites, due to their environmental and structural challenges, presented unique opportunities for regeneration through greening and afforestation.

Site 2 provides a prime example of how contamination can dictate the direction of redevelopment. The site had been used for over 20 years as a phosphate ore dumping ground, which made it impossible to reach ground level or achieve structural stability for any type of construction. This extreme disturbance to the soil and environment made the site unsuitable for residential, commercial, or industrial development. As a result, parkification became the most viable option, allowing for extensive rehabilitation efforts, including afforestation, to restore ecological balance and create a new purpose for the site.

Similarly, Site 1, despite being owned by the Greater Amman Municipality (GAM), faced its own set of challenges due to its nature as a man-made pond. The specific conditions of the site—combined with its contaminated and disturbed landscape—made it difficult to undertake construction or other development activities. The pond's unstable terrain and the ongoing environmental issues associated with the site hindered the potential for more conventional urban development. Consequently, transforming the site into green infrastructure, like a park, became a more suitable solution that could address both the environmental damage and the need for accessible public space.

In contrast, Site 3 posed a more complex scenario. While it was protected from immediate urban development due to its ownership by a phosphate company, the lack of interest in converting it into a park led to its continued neglect and misuse. The site's contamination and disturbance left it vulnerable to degradation, but without incentives for long-term restoration, other types of development were considered instead.

In all cases, the post-industrial nature of these sites—marked by contamination, soil instability, and environmental degradation—played a crucial role in the decision to prioritize green infrastructure over other development models. Rather than pursuing traditional forms of urban development that would have been hindered by the challenges of these sites, the focus shifted toward rehabilitation through greening, afforestation, and ecological restoration

Landownership and Its Impact on Parkification Development

Landownership dynamics at the three parkification sites played a crucial role in determining the type of development that could occur. Site 2, located on treasury land, provided a unique advantage for parkification. The public ownership of the land allowed for smoother coordination between the municipality and other stakeholders, facilitating the transformation of the area into a park without significant land-use conflicts. This public ownership meant that there were fewer external pressures from private interests, allowing the project to focus solely on environmental restoration and community benefits.

In contrast, Site 3 was owned by the phosphate company, which helped protect the land from

immediate destruction but not from other challenges. While the company's ownership prevented more invasive or profit-driven developments, it also posed hurdles to the transformation of the site into a public park. The site was frequently subjected to vandalism, and the lack of a clear governance structure meant that efforts to secure funding and manage the land were often fragmented. The company's involvement also complicated efforts to repurpose the site for community use, as they had different priorities and limited interest in converting the site into a public green space.

Finally, the Pepsi Pond site, owned by the Greater Amman Municipality (GAM), created a different set of challenges. Although GAM's ownership of the land provided authority over its use, it also made it difficult for other stakeholders to collaborate effectively. With GAM's tight control over the site, there were fewer opportunities for private sector involvement or multi-stakeholder partnerships, limiting the potential for shared funding and decision-making. The governance structure around Pepsi Pond required more coordination between municipal bodies and local authorities, which slowed down efforts to realize its potential as part of an integrated greenway system.

In all three cases, landownership issues shaped the type of development that could take place. While Site 2 benefited from its public ownership, Sites 3 and Pepsi Pond faced challenges due to private or municipal ownership, which hindered collaboration and alternative development pathways.

The Ruseifa case underscores the power of demonstration projects in driving systemic change. These three sites have become proof-of-concept models that showcase the feasibility of repurposing degraded industrial land into multifunctional urban parks. Their success has attracted the interest of local authorities, private developers, and community groups, creating a coalition of stakeholders committed to expanding the region's green infrastructure. This convergence of efforts has positioned Ruseifa as a model for sustainable urban regeneration, where parkification is not only about transforming isolated sites but also about reimagining the urban landscape as an interconnected and adaptive system.

Discussion and Conclusion

Analyzing the parkification of three post-industrial sites in Ruseifa—Pepsi Pond, the phosphate ore landfill, and the old phosphate mine—reveals how these transformations have sparked broader environmental and urban regeneration efforts. Initially not planned as parks, these sites have become catalysts for green infrastructure, promoting green corridors, neighborhood improvements, and streetscape upgrades. Their proximity enabled seamless integration into a connected greenway network, enhancing ecological value, water management, and biodiversity.

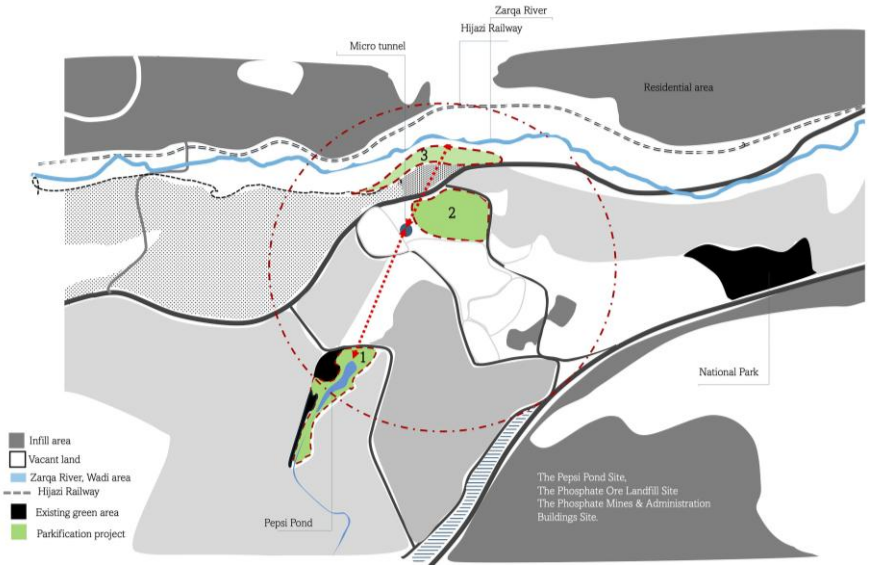
The ripple effect of parkification extends beyond the parks themselves, fostering collaboration between local authorities, government bodies, and community groups. This multi-stakeholder approach has been key to successful implementation, with Site 2's public ownership facilitating smoother coordination compared to the challenges faced at the other sites, where governance issues required greater collaboration.

These projects have not only restored degraded land but also strengthened urban connectivity and community engagement. The parks are central to a greenway linking recreational spaces across Ruseifa, improving the quality of life for residents and positioning the area as a model for

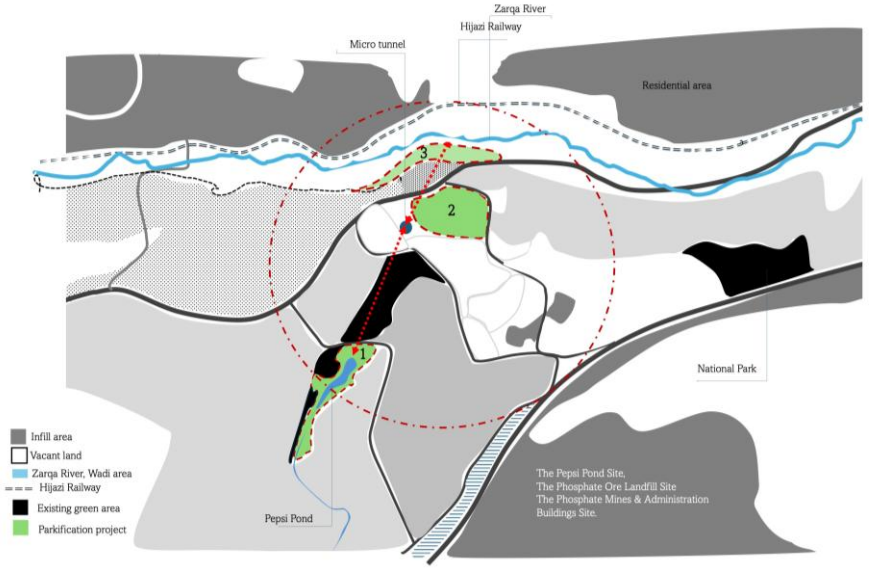
sustainable urban regeneration.

Moreover, the parkification process has highlighted the value of post-industrial sites as opportunities for innovative urban renewal. The environmental challenges these sites presented—such as contamination and instability—made conventional development difficult, but their transformation into green spaces has proven that such sites can be repurposed to meet ecological, social, and urban needs. This approach showcases how cities can turn environmental liabilities into assets, fostering resilience and sustainability while enhancing public well-being.

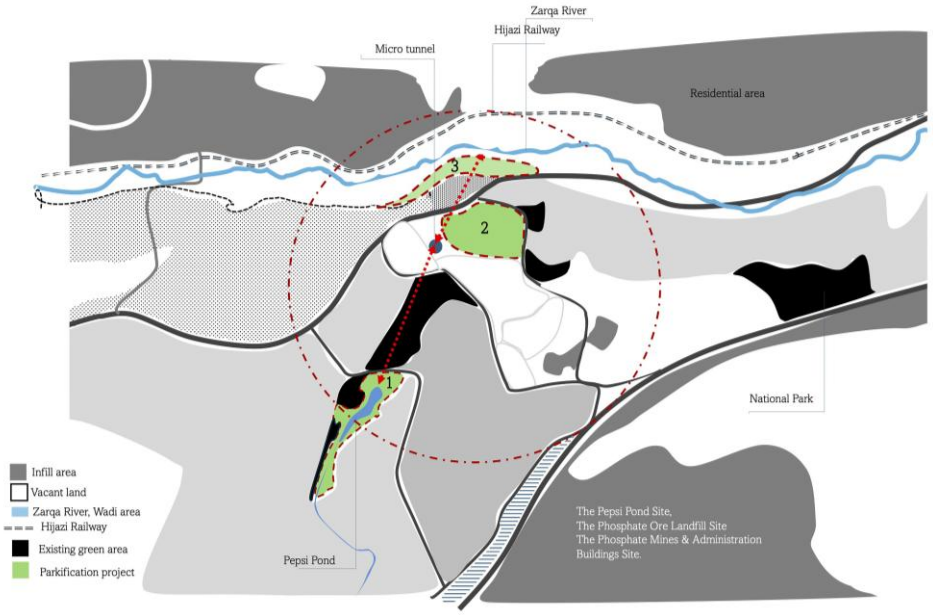
Table 1. Map Series: Ripple Effect of Greening and Afforestation Impacted by Parkification



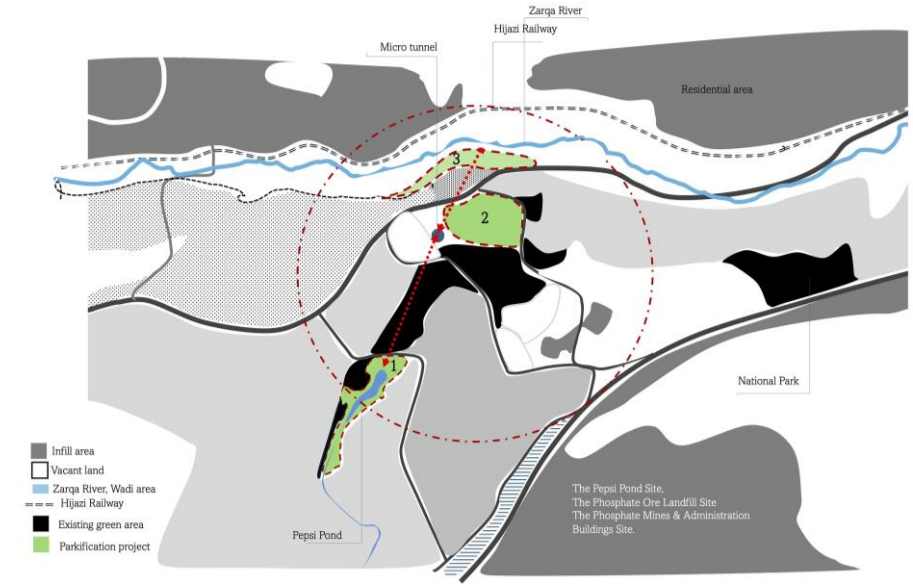
Construction of Parkification Projects (2023)
This map shows the three parkification projects initiated simultaneously in 2020 across Ruseifa City. It highlights the locations of the parks, their proximity to one another, and surrounding infrastructure.



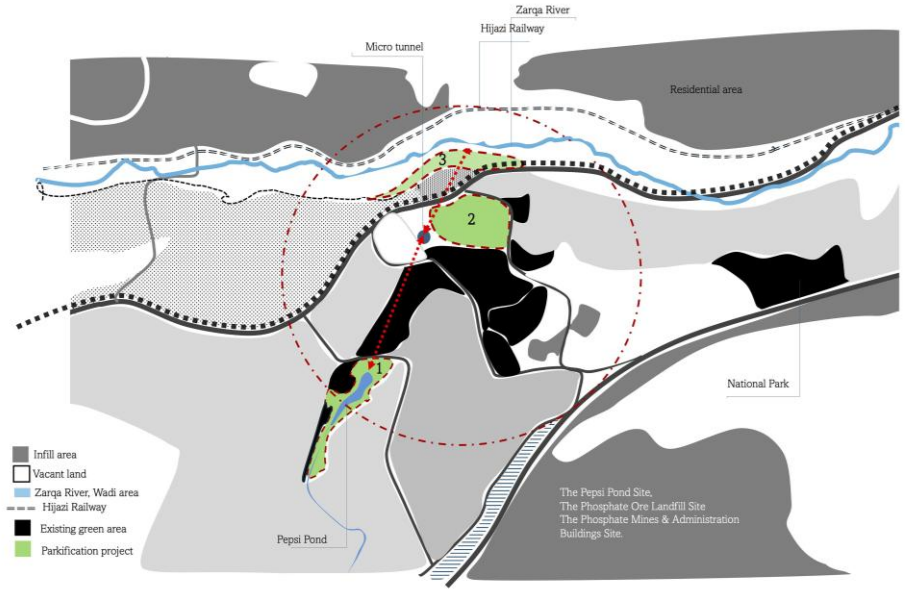
Micro-Tunnel and Greening Impact on Site 1
This map focuses on the micro-tunnel construction beneath the phosphate piles at Site 1. It shows how the tunnel construction impacted adjacent areas, particularly how it led to the extension of the wetland of site 1 and greening the area above the tunnel. Also, the extension of Site 2's park into the area on the right, following the rehabilitation of the phosphate ore landfill.



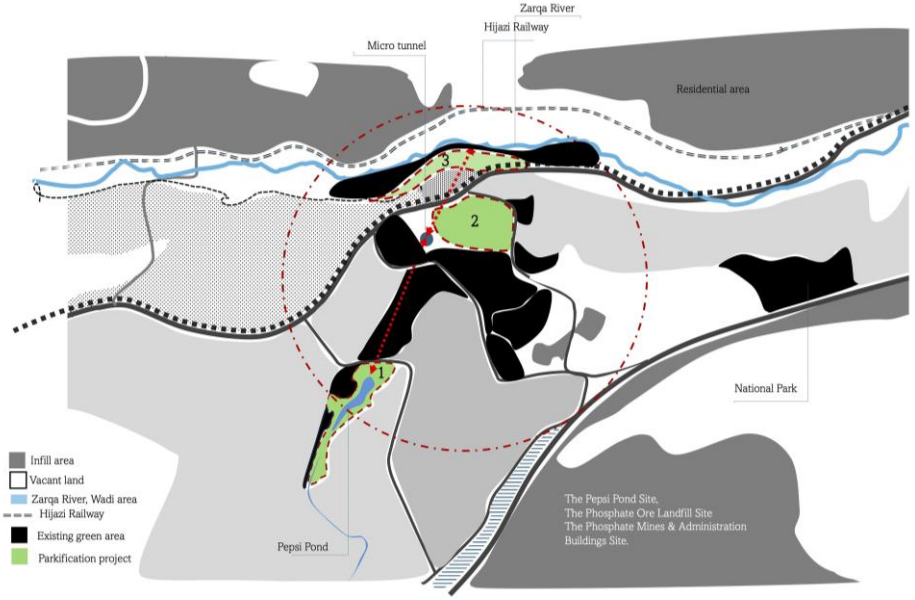
Extension of Park to the Right (Site 2)
This map illustrates the extension of Site 2's park into the area on the right, following the rehabilitation of the phosphate ore landfill. It highlights how the parkification process expanded into adjacent lands, transforming formerly industrial spaces into green parklands. The map also shows the early stages of afforestation projects in this area, laying the groundwork for future ecological restoration and park development.



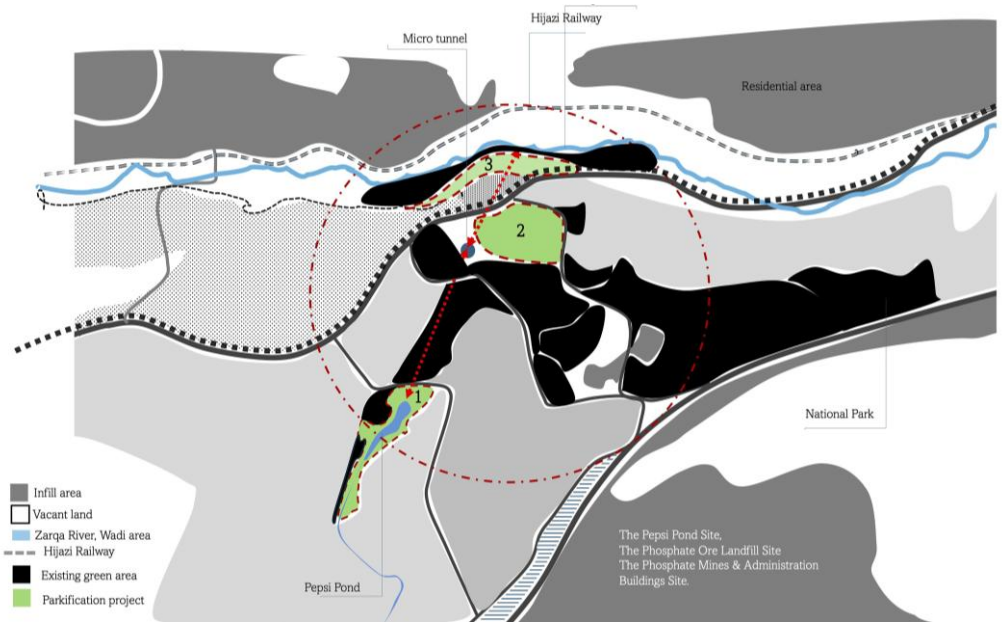
Stage 1 and Stage 2 of Afforestation at Site 2
This map highlights the first two stages of afforestation around Site 2, showing the progression from industrial land to green space. The map demonstrates how afforestation stages were strategically planned to enhance the park's green infrastructure.



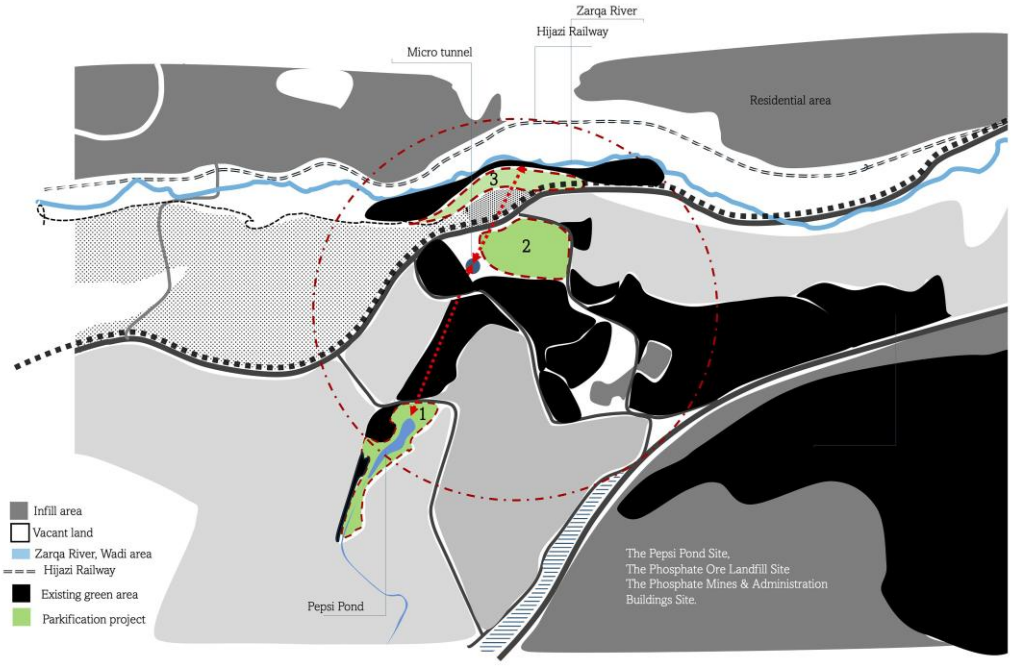
Stage 3 of Afforestation at Site 2
This map shows Stage 3 of the afforestation process around Site 2, depicting how the green space continued to expand. It highlights the additional planting areas and the ongoing integration of green infrastructure into the park's design. The map reflects the growth of green corridors and improved ecological connections within the park and adjacent lands.



Stage 4 of Afforestation Supporting the Park at Site 2
This map illustrates the final phase of afforestation (Stage 4) surrounding the park at Site 2. It shows how afforestation efforts have further expanded the park and strengthened greenway connectivity. The map highlights completed planting efforts, the completion of the green infrastructure plan, and the role of afforestation in enhancing urban sustainability in Ruseifa.



Development of Area Under Site 3 and Redevelopment of National Park and Livestock Market Relocation
the redevelopment of the national park area and the relocation of the livestock market. It shows how the transformation of nearby green spaces has been influenced by the parkification projects. This map focuses on the area beneath Site 3, where the micro-tunnel exits into the river. It shows how this area has been preserved for agriculture and open spaces, balancing development and ecological conservation.



Development of Adjacent Neighborhood and Main Road to Amman
This map shows the development of the neighborhoods adjacent to the parkification sites and the main road connecting Ruseifa to Amman. It highlights the urban expansion driven by the parkification projects and shows how these developments are supported by new infrastructure, including roads and greenway corridors.

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