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Al-Bireh Resilient City

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1 ABSTRACT

Al-Bireh city, located in the central West Bank, faces growing challenges due to climate change, Israeli occupation, and settlers. The municipality has implemented five key strategies to enhance resilience and sustainability: Adaptive urban planning, Climate change mitigation policies, Building community resilience, Enhancing food security, and Sustainable mobility. These strategies are aligned with the Sustainable Development Goals (SDGs), aiming to create a resilient, adaptive, and sustainable urban environment. The implementation of these strategies positions Al-Bireh as a model for cities facing similar challenges worldwide.

Keywords: sustainability, community, resilience, Al-Bireh, climate change

2 INTRODUCTION

Al-Bireh, a key urban center in the West Bank, faces significant challenges related to urban planning, green space reduction, environmental degradation, and political constraints stemming from the Israeli occupation. The city's rapid expansion, compounded by territorial restrictions and urban sprawl, has created a complex situation for sustainable development. Furthermore, Al-Bireh is experiencing a decline in green spaces, compounded by pressure from residential and commercial development. Environmental challenges, including climate change, air and water pollution, and limited natural resources, exacerbate these issues. This paper explores the municipality's strategies to enhance urban resilience and sustainability in the face of these challenges, while aligning with the United Nations Sustainable Development Goals (SDGs).

3 METHODS

3.1 Research Design

This study follows a qualitative research methodology to assess the resilience strategies of Al-Bireh. The research combines primary data (interviews with municipal officials, field observations) and secondary data (academic literature, municipal reports, international reports) that are aligned with global sustainability standards and the Sustainable Development Goals (SDGs). This approach helps evaluate Al-Bireh's efforts in sustainable urban planning, climate resilience, and community-building in the context of international best practices and frameworks for sustainable development.2.2 Data Collection

Primary data was collected through interviews with key municipal departments, such as the Planning and Engineering Department, the Cultural Department, and the Media and Public Relations Department, as well as field observations of the urban landscape. Secondary data sources included plans, policies, reports, and documents provided by the Al-Bireh Municipality, academic publications on urban sustainability, and international reports on climate resilience and SDG localization.

3.2 Data Analysis

The data was analyzed thematically, with a focus on identifying the collected data was analyzed using a thematic approach, focusing on identifying key themes and patterns related to the alignment of Al-Bireh's urban strategies with the Sustainable Development Goals (SDGs). The analysis aimed to assess the effectiveness of municipal strategies in fostering urban sustainability and resilience, with particular emphasis on the integration of climate action, social inclusion, and environmental stewardship.The five primary strategies evaluated in this analysis include:

Al-Bireh Urban Planning:

Current Situation and Issues:

(1) The Master Plan and Limited Green Spaces: The approved master and organizational plan for the city of Al-Bireh, which was ratified in 2003 covering an area of 10,854 dunams, suffers from shortcomings in maintaining an environmental balance between residential areas and green spaces. This plan did not allocate enough space for green areas, leading to a significant shortage, as green spaces make up less than 1% of the

city's organizational area. This deficiency negatively impacts the quality of life in the city, contributing to environmental challenges such as air pollution and rising temperatures, as well as reducing spaces dedicated to recreation and leisure.

(2) Population Growth and Migration: Al-Bireh suffers from a significant population increase due to its centrality in the West Bank, with a large influx of people migrating from the north and south of the West Bank. This population growth places additional pressure on the city's infrastructure and public services, increasing the need to allocate more space for urban expansion and sustainable growth, the currently city population around 120,000 capita.

(3) Land Restrictions under Israeli Control: The city of Al-Bireh covers an area of approximately 22,198 dunams, but 51% of this area is classified as "Area C" according to the Oslo Accords, meaning it is under Israeli civil and military control. As a result, citizens and the municipality are not allowed to invest in or utilize these lands, which restricts urban growth and development in the city.

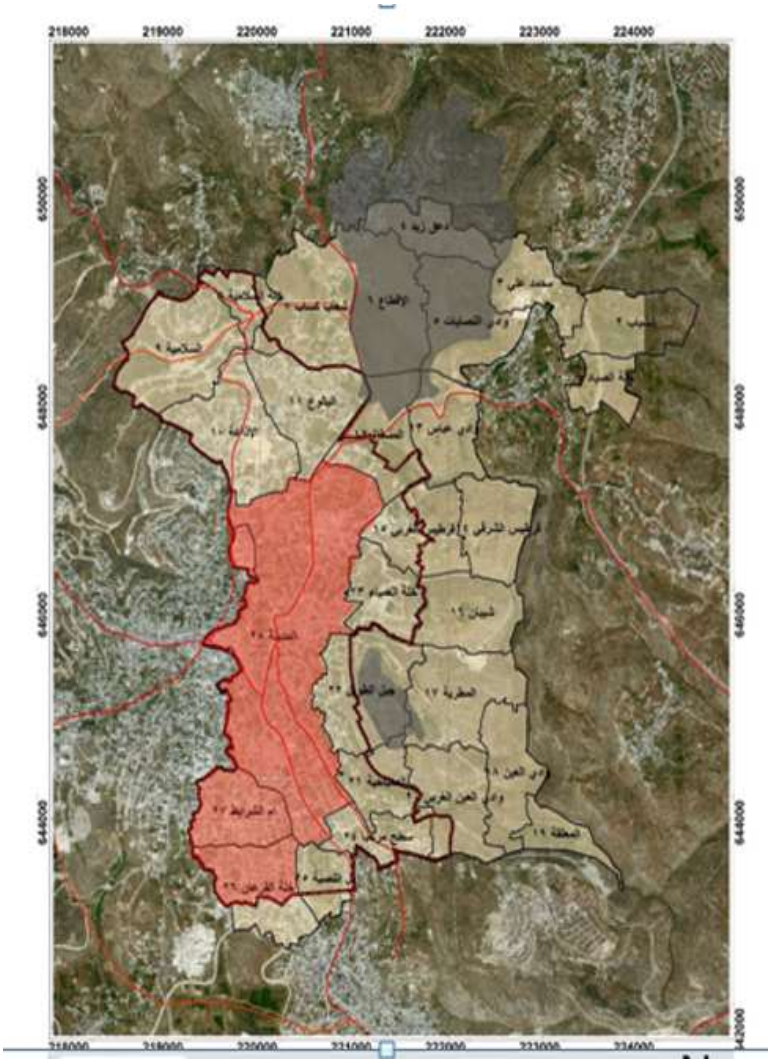

Figure 1.

(4) Israeli Settlements: Two Israeli settlements are located to the north and east of the city: the Beit El settlement (covering 1,800 dunams) and the Psagot settlement (covering 308 dunams). This distribution leads to the division of the city and limits equitable access to services across all areas of the city.

3.3 Impacts of Climate Change in Al-Bireh:

Current Situation and Issues:

Al-Bireh, like many cities around the world, is experiencing the increasing impacts of climate change. These impacts are clearly manifested through rising temperatures and decreasing rainfall, which exacerbate the city's environmental challenges. One of the most prominent impacts is the urban heat island effect, where the

city records a significant rise in temperatures due to the lack of green spaces and the increase in urban density. This leads to higher temperatures as buildings and infrastructures reflect heat.

Additionally, the lack of green spaces is a major factor contributing to the increased local temperatures. The scarcity of parks and recreational areas prevents the city from benefiting from the natural cooling effects provided by green spaces. Therefore, preserving and expanding green spaces is a crucial strategy to mitigate the effects of urban heat islands and improve the overall quality of life in the city.

Challenges Related to Water and Electricity:

In addition to the climate impacts, the residents of Al-Bireh face significant challenges concerning basic natural resources, such as water and electricity, due to the restrictions imposed by the Israeli occupation.

(2) Control over Water Resources: Water sources in the West Bank, including Al-Bireh, are under strict Israeli control. Israeli authorities prevent Palestinians from drilling new deep wells or deepening existing wells and impose restrictions on the amount of water that can be extracted, limiting the city's ability to meet the needs of its population. In contrast, Israeli settlements are permitted to use groundwater for agricultural irrigation, leading to the depletion of local water resources. For example, the drilling of deep wells in the Al-Auja settlements near Jericho has resulted in the drying up of local springs and increased water salinity, negatively affecting local agriculture.

(2) Challenges in the Electricity Sector: Al-Bireh also faces challenges in the electricity sector, as the city's electricity distribution companies do not have the license to generate or produce electricity. The city's electricity supply is limited to what is provided by the Israeli electricity company "Mekorot," which can reduce the amount of electricity allocated to Palestinians, leading to frequent power outages. Additionally, there are limited efforts to import electricity from some Arab countries, but these attempts face many obstacles due to Israeli policies and available infrastructure.

3.4 Al-Bireh City and Community

Current Situation and Issues:

Al-Bireh city is one of the central cities in the West Bank, playing a vital role in the political, economic, and social life of the region. It has around 25,000 families, with a population of approximately 120,000 people. The city also hosts numerous governmental and private institutions that contribute to promoting sustainable development, providing essential services, and supporting the local community in various fields. In this context, the institutions in Al-Bireh can be divided into the following categories: Charitable and Developmental Associations: There are around 30 associations working in various fields such as community development, health, environment, and education. These associations significantly contribute to improving the quality of life and supporting vulnerable groups in the community.

Government Ministries and Institutions: Al-Bireh hosts several government ministry offices, including the Ministry of Education, Ministry of Health, Ministry of Interior, and others. The city has about 10-15 government offices, reflecting its important role in providing services to the citizens.

Non-Governmental Organizations (NGOs): There are numerous NGOs in the city that work in the fields of human rights, sustainable development, and environmental support. The number of these organizations ranges from 30-40, reflecting active community engagement and cooperation with local and international institutions.

Consulates and Diplomatic Offices: Although Al-Bireh does not directly host consulates, it is located near Ramallah, where there are approximately 15-20 consular offices representing different countries. These offices enhance diplomatic and administrative communication with the Palestinian community.

3.5 Limited Agricultural Land and Resource Access in Al-Bireh

Current Situation and Challenges:

(1) Unused Lands in Area C:

A large portion of Al-Bireh's lands, especially in Area C (which is under full Israeli control according to the Oslo Accords) which is around 51% from Al-Bireh Area, remains unused or restricted. Area C is a vital region for both urban and agricultural expansion, but it is subject to restrictions imposed by Israeli authorities. These restrictions prevent Palestinians from fully utilizing the land for agricultural or

construction purposes, limiting the ability to expand food production or enhance food security through sustainable farming.

The lack of access to these lands makes it difficult for the municipality to implement large agricultural projects that could contribute to local food production and enhance food security.

(2) Land Classification and Uses:

As a central city, Al-Bireh experiences high demand for land for urban and commercial expansion. As a result, most of the land in the city is classified for commercial or residential use rather than agricultural purposes. This classification limits the use of available land for agriculture and makes it more challenging to increase local food production.

Additionally, land prices in the city are extremely high due to the demand for urban and commercial expansion, making it difficult for local agricultural initiatives to invest in these lands for sustainable agriculture or food security purposes.

(3) Limited Agricultural Land in the City:

The amount of land available for farming within Al-Bireh is limited due to urbanization in the area and the restrictions on land use. Therefore, agricultural activities within the city are restricted, and much of the food supply relies on external sources, which increases the challenges associated with price fluctuations and supply disruptions.

Furthermore, the city lacks sufficient space for food cultivation within urban areas, which has led to a reduction in land designated for agriculture due to the increasing demand for residential and infrastructural land.

(4) Water and Resource Scarcity:

Access to water, which is a crucial resource for agriculture, is a significant challenge in Al-Bireh due to the restrictions imposed by Israeli authorities on access to water. The city, like many other Palestinian areas, struggles to secure its water needs for both urban and agricultural use.

In addition to water scarcity, the availability of resources such as fertilizers and other agricultural inputs is often limited, hindering the ability to expand agricultural projects and sustain them.

3.6 Challenges in Sustainable Mobility and Connectivity in Al-Bireh

Current Situation and Challenges:

Al-Bireh city faces several challenges related to sustainable mobility and connectivity, highlighting the urgent need to improve the city's transportation infrastructure. Despite ongoing efforts to improve transportation means, several factors hinder the development of this sector in the city.

(1) Traffic Congestion and High Emissions

Al-Bireh suffers from severe traffic congestion, especially during peak hours, as the city is a residential and commercial hub in the West Bank. This congestion leads to increased carbon emissions from vehicles, significantly contributing to air pollution and rising temperatures in the city.

Additionally, the absence of sustainable transportation options, such as bike lanes or an effective public transportation system, exacerbates this issue, making most residents rely on private cars for daily commuting.

(2) Road and Sidewalk Infrastructure

Road Conditions: The road network in Al-Bireh is outdated and does not meet the needs of the growing population or increasing traffic. Many roads are narrow or poorly maintained and lack traffic signals or effective traffic monitoring systems, leading to accidents and decreased efficiency in road usage.

Sidewalks: Although there are some sidewalks in parts of the city, they are often incomplete or in poor condition, posing risks to pedestrians and discouraging walking. Some sidewalks are obstructed by parked cars, hindering pedestrian movement, which makes walking an uncomfortable option for residents.

(3) Lack of Effective Public Transportation

Although Al-Bireh has a network of small buses (microbuses), this network is still inefficient and disorganized. Public transportation covers some areas but lacks integration in transportation networks or proper connectivity with other parts of the city or surrounding areas. Furthermore, the bus routes are often irregular, leading to long wait times and overcrowding on public transport.

The city lacks a unified, effective public transportation system that connects urban areas with each other or coordinates with neighboring municipalities such as Ramallah and Betunia, creating significant gaps in inter-city mobility.

Limited Bicycle and Walking Infrastructure

Despite the global shift towards promoting cycling and walking as sustainable modes of transportation, Al-Bireh lacks the necessary infrastructure for these activities. There are no dedicated bike lanes, and the streets in the city are not pedestrian-friendly, making it difficult for residents to adopt these modes of transport. Furthermore, these factors hinder the move towards reducing reliance on private cars.

4 RESULTS AND MUNICIPALITY STRATEGIES

In response to the multifaceted challenges facing Al-Bireh which mentioned above, the municipality has developed a set of innovative and strategic initiatives aimed at fostering sustainable development. These efforts are designed not only to address the city's immediate challenges but also to lay the groundwork for a resilient, inclusive, and environmentally conscious future. By integrating adaptive urban planning, climate change mitigation measures, community empowerment, food security initiatives, and sustainable mobility, These strategies are aligned with global frameworks such as the Sustainable Development Goals (SDGs), ensuring that the city's progress is both locally relevant and globally impactful. The following sections present the key results and strategic actions the municipality is undertaking to navigate its challenges.

4.1 Adaptive and Sustainable Urban Planning (SDG 11: Sustainable Cities and Communities)

- Urban Growth, Environmental Sustainability, and Green Spaces Integration: The updated master plan of Al-Bireh focuses on balancing urban growth with environmental sustainability. Despite the challenges posed by political and territorial constraints, the municipality has ensured the inclusion of green spaces, environmental preservation, and resilience-building strategies in its planning. A key feature of this plan is the strategic incorporation of green spaces and open areas, which are designed to enhance the city's environmental quality, provide recreational spaces for the community, and mitigate the urban heat island effect. This integration not only promotes a healthier urban environment but also contributes to the city's overall resilience, making it more adaptable to climate challenges. The goal is to create an urban environment that respects nature while accommodating population growth and development needs.
- Service Area Redistribution: The updated plan also focuses on the equitable distribution of services across the city. By redistributing service areas, the municipality aims to promote social equity and ensure that all neighborhoods, especially underdeveloped ones, receive adequate access to essential services such as water, sanitation, and transportation.
- Incorporation of Area C Lands: The master plan also includes lands in Area C, which are subject to Israeli control. Despite the legal and territorial restrictions, the municipality has developed urban and environmental master plans for these lands to ensure comprehensive and sustainable development. The goal is to use these lands effectively for residential, commercial, and green space projects, despite the challenges posed by the occupation.

4.2 Policies for Climate Change Mitigation (SDG 13: Climate Action)

- Tree Protection Policy: Al-Bireh has implemented strict regulations to protect trees by prohibiting their removal, imposing significant fines, and requiring environmental compensation based on international standards (DBH – Diameter at Breast Height). These regulations are essential in preserving the city's green canopy and mitigating the effects of climate change.
- Rainwater Harvesting: New residential and commercial buildings are mandated to install rainwater harvesting systems. This policy aims to reduce the pressure on local water resources by collecting and utilizing rainwater, promoting water sustainability within the city.

- Renewable Energy Initiatives: The municipality has begun installing solar panels in most government schools and is exploring incentives for private homeowners and investors to adopt clean energy solutions. This initiative is being carried out in collaboration with relevant authorities. Additionally, the municipality plans to build a new school that will be a green building according to the EDGE classification, making it the first green school in Palestine. The design tender for this project will be issued soon.
- Green Spaces: Building regulations and municipality policies ensure that at least 10% of the front setback area in new developments must remain green and permeable. This initiative is designed to improve water infiltration, reduce the urban heat island effect, and promote environmental sustainability in urban areas.

This set of policies highlights Al-Bireh's commitment to adapting to climate change, enhancing resilience, and contributing to global climate action goals.

Figure 2.

4.3 Building Community Resilience

(SDG 16: Peace, Justice, and Strong Institutions)

To enhance the community's ability to adapt to challenges, the Al-Bireh Municipality has implemented several initiatives aimed at fostering resilience. These efforts focus on increasing awareness, building capacity, promoting social cohesion, and empowering vulnerable groups. The key actions taken to develop a more resilient and inclusive community include:

- Awareness Campaigns: Conducting public awareness campaigns to educate schools and the community about climate change adaptation and disaster response.
- Capacity Building: Organizing training programs for staff and community members on sustainable infrastructure, emergency management, and climate change adaptation.
- Social Cohesion: The Al-Bireh Municipality serves as the primary umbrella for charitable associations and civil society organizations in the city, working to strengthen community bonds by providing necessary logistical support and services to ensure the resilience and sustainability of these institutions. The municipality also coordinates efforts and unifies programs aimed at enhancing social cohesion and contributing to sustainable community development.
- Support for Farmers and Artisans: Allocating municipal squares and central halls weekly for farmers and artisans to display and sell their products, thereby enhancing their economic resilience and supporting local craftsmanship.
- Empowering Women: Operating a specialized center dedicated to supporting and empowering women, which currently includes approximately 200 women. The center organizes workshops and training sessions aimed at economically and socially empowering women, highlighting their pivotal role in society.
- Collaborative Approach: Establishing partnerships with local organizations and neighboring municipalities to ensure coordinated disaster response and the sharing of best practices, thereby strengthening community resilience.

Through these initiatives, the Al-Bireh Municipality aims to build a strong, cohesive community capable of effectively facing social, economic, and environmental challenges with resilience and sustainability.

4.4 Enhancing Food Security and Utilizing Unused Lands

(SDG 2: Zero Hunger, SDG 12: Responsible Consumption and Production)

Al-Bireh Municipality is committed to enhancing food security by effectively utilizing unused lands, particularly in Area C, through the establishment of community orchards. These initiatives aim to provide locally grown food and promote sustainable agricultural practices.

Community Orchards: The municipality collaborates with landowners in Area C and local institutions to develop community orchards. These efforts offer residents access to fresh, locally produced goods and strengthen community bonds.

Figure 3.

Challenges in Area C: Area C constitutes approximately 61% of the West Bank's territory and remains under full Israeli control, both administratively and militarily. Palestinians face significant obstacles in obtaining permits for construction or land development in this area, with the Israeli authorities often rejecting such applications on grounds of lacking approved master plans.

By implementing these initiatives, Al-Bireh Municipality strives to enhance food security and support sustainable agricultural practices, contributing to the well-being of the local community and reinforcing their resilience in the face of ongoing challenges.

4.5 Sustainable Mobility and Connectivity (SDG 9: Industry, Innovation, and Infrastructure)

Al-Bireh Municipality, in collaboration with the municipalities of Ramallah, Beitunia, Surda, and Abu Qash, aims to develop a sustainable transportation system that enhances mobility between these cities and reduces harmful emissions. To achieve this, a joint master plan has been prepared, encompassing short-term, medium-term, and long-term strategies developed by specialized consulting teams.

- Short-Term Transportation Plans: These include immediate solutions to improve traffic flow and reduce congestion, such as optimizing traffic signal timings and designating dedicated lanes for public transportation.
- Medium-Term Transportation Plans: These focus on developing transportation infrastructure, including expanding road networks and establishing modern public transit stations to enhance connectivity among the cities.
- Long-Term Transportation Plans: The goal here is to create a sustainable transportation system that incorporates public and smart transportation options, as well as developing pedestrian and bicycle networks to promote clean and healthy mobility.

5 DISCUSSION

Al-Bireh's resilience strategies effectively address urban growth and environmental sustainability, demonstrating alignment with several SDGs. The city's adaptive urban planning integrates green spaces, climate adaptation measures, and sustainable urban growth, which is vital given the political challenges the city faces. The municipality's climate change mitigation policies, including tree protection, renewable energy, and water conservation measures, showcase a proactive approach to reducing environmental impact.

Community resilience-building efforts, such as awareness campaigns and disaster response training, empower residents to address climate-related challenges. Local food security initiatives, such as community orchards, foster sustainable agriculture and reduce reliance on external food supplies. The city's sustainable mobility initiatives, focusing on reducing emissions and improving regional transportation connectivity, support long-term urban sustainability.

However, the political constraints imposed by the Israeli occupation, including the division of land into different zones and the expansion of Israeli settlements, present significant challenges to fully implementing these strategies. These factors limit the municipality's ability to expand green spaces, develop new infrastructure, and utilize land in Area C, highlighting the need for adaptive and flexible planning in the face of such external pressures.

6 CONCLUSION

Al-Bireh's strategies provide valuable lessons for other cities facing similar political and environmental challenges. By integrating sustainable urban planning, climate change mitigation, community resilience-building, food security initiatives, and sustainable mobility, Al-Bireh has demonstrated how cities can adapt to complex challenges while promoting long-term sustainability. Despite the constraints imposed by Israeli occupation, the city's efforts align with the SDGs, positioning Al-Bireh as a model for other cities in conflict zones seeking to enhance resilience and sustainability.