



An-Najah National University
Faculty of Graduate Studies

**MAPPING IN CONFLICT REGIONS:
ANALYZING THE DOCUMENTATION OF
HISTORICAL SITES ON OPENSTREETMAP
BETWEEN PALESTINIANS AND ISRAELI
SETTLERS IN THE WEST BANK**

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**This Thesis is Submitted in Partial Fulfillment of the Requirements for the Degree
of Master of Geomatics, Faculty of Graduate Studies, An-Najah National
University, Nablus - Palestine.**

2025

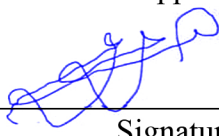
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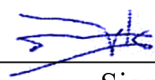
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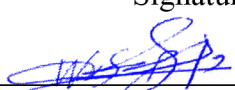
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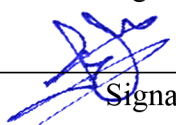
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Dedication

To everyone who believed in me, to everyone who encouraged me, to my mother, who has been my first supporter, always giving love and being proud of me; to my father's soul, whose memory never leaves us; to my sister, who always has my back and has been by my side; to all my beloved brothers.

To my dear husband, who supports me in every step and stands by my side in tough times.

To my homeland, which has suffered for a long time from the injustice of occupation.

Finally, to all my friends who loves and supports me.

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I would like to express my heartfelt appreciation to my supervisors, Dr. Loai AbuRaida and Dr. Eehab Hijazi, for their invaluable support, insightful guidance. Their expertise has been instrumental in shaping this thesis.

I also extend my sincere gratitude to An-Najah National University.

Eng. Rahaf Hafitha

Declaration

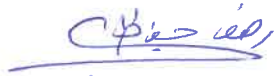
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I declare that the work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

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Abstract

The history of the Israeli-Palestinian conflict is long and has extended over decades, during which Israeli settlers have attempted to control the land of Palestine by using various methods and telling different narratives. With the development of technology and the emergence of volunteered geographic information (VGI) platforms such as the OpenStreetMap (OSM) platform, they play an important role in documenting sites in geopolitically contested regions such as the West Bank. This study aims to analyze the contributions of both Israeli and Palestinian settlers on the OpenStreetMap platform and study the motives behind each party's contributions.

The research follows a quantitative approach, combining spatial analysis and Metadata analysis to assess the extent and accuracy of coverage of historical sites on OSM and to examine the contributions of Palestinians and Israeli settlers to the platform. Furthermore, a questionnaire was made to measure Palestinian awareness about OSM platform, The questionnaire included 340 respondents from across the West Bank.

The results reveal a clear difference between the historical sites documented on OSM (653) and those found in official and academic records (1928). This is due to the voluntary nature of the platform, which allows local residents to document sites from their own perspectives, free from formal legal restrictions. Furthermore, 63.25% of historical sites located in Area C under Israeli control, and 397 sites ($\approx 61\%$) fell within Israeli areas of influence compared to 266 sites ($\approx 41\%$) in Palestinian areas. Metadata analysis revealed that Israeli users documented 29 sites and Palestinians 27 from a sample of 115 users, but Israeli contributions were generally more detailed and accurate, while many Palestinian contributions were misclassified or limited.

Keywords: Volunteered Geographic Information (VGI), OpenStreetMap (OSM), Historical Sites, Spatial Analysis, Metadata Analysis, Conflict Mapping, Israeli–Palestinian Conflict

Chapter One

Introduction

1.1 Background

Volunteered geographic information (VGI) is a process in which non-specialists collect and share geographic data across digital platforms. Open Street Map (OSM) is one such voluntary platform that enables local communities to play an active role in documenting their surrounding environment. The importance of local participation cannot be underestimated, as it offers a new, bottom-up approach to geographic data documentation, as opposed to the traditional top-down model dominated by government and professional organizations (Goodchild, 2007). This approach allows anyone to voluntarily provide comprehensive and more detailed information about their communities, enhancing the accurate representation of geographic data.

The West Bank contains numerous historical sites of religious and cultural significance, which are an integral part of the region's identity and constitute a cultural heritage for the Palestinian people. Against this backdrop, Israeli Zionist organizations are continually seeking to Judaize these areas and incorporate them into their historical narrative under the pretext of seizing the land (Rashid Khalidi, 1997).

In this context, the OSM platform, as a voluntary platform open to contributions from anyone, provides local Palestinian residents an opportunity to document their areas, especially historical sites. This allows for their preservation, access to the world, and creates a digital reference record.

The number of previous studies talked about documenting on (OSM) in the West Bank are few and limited to foreign researchers. Among these studies, the researcher Bittner highlights three studies conducted over several years, focused on the documentation of open geographic platforms between Palestinians and Israelis.

In this study (Bittner, 2017a), Bittner discussed the concept of VGI by comparing the representation of Jerusalem on OSM and Wikimapia, which is considered a socially divided city. The results revealed significant differences in the documented data. Wikimapia featured contributions from local cartographers, resulting in a more detailed representation of the city, while OSM included contributions primarily from international

cartographers. Bittner, therefore advocated for the use of the term cartographic patterns that take into account cultural, social, and technical aspects.

In his study (Bittner, 2017b), Bitner further investigated of contributions of Israelis and Palestinians on the OSM platform. Using a mixed-methods approach combining quantitative and qualitative analysis, the researcher comparatively analyzed the genesis of OpenStreetMap in Israel and Palestine. The results showed that Israeli and international cartographers had the greatest contribution to documentation on OSM, while Palestinian participation was limited. This disparity in Israeli and Palestinian participation on OSM reflects the geopolitical tensions existing between them on the ground. Bitner suggested that the reason for the weak Palestinian participation in the documentation process is due to OSM's "field truth" model, which prioritizes mapping observable elements. This, in turn contributes to the low Palestinian engagement on the platforms, as it disagrees with the Palestinian perspective, which views certain physical locations as expressions of oppression. (Carraro & Wissink, 2018) supported this view, claiming that some Palestinians deliberately “disengage” from such platforms, seeing it as a form of anti-normalization by choosing not to participate in platforms that legitimize the status quo.

Bittner & Glasze (2021) emphasized that digital maps are not neutral, through an analysis of OpenStreetMap and Wikimapia data. The results concluded a disparity in the participation of Palestinians and Israelis on the two platforms, with Israeli contributions dominating on OSM platform, while Wikimapia contains greater contributions from Palestinian users. This is due to the difference in the two platforms' philosophies: OSM relies on "ground truth" approach which legitimizes the occupation, while Wikimapia gives space to Palestinian narratives.

The studies above confirm that more people from the area should be involved in digital mapping to make it more accurate and diverse. (Bittner, 2017a) emphasized the need to develop strategies to improve community engagement in documentation process, while Bittner & Glasze (2021) suggested targeted training and capacity-building initiatives to empower local mappers. Bittner (2017b) and Carraro & Wissink (2018) agreed that it is important to get everyone involved and think critically about the models that collaborative mapping tools are based on. They said that making people more aware of the political and social aspects of mapping can help make sure that digital mapping tools don't strengthen current power structures.

This thesis therefore delves deeper into the analysis of VGIs' platforms such as OSM in the West Bank. It compares the contributions of Palestinians and Israeli settlers in documenting historical sites. It also examines the motivations behind each party's documentation process and explores the resulting political and social implications.

The first chapter reviews the importance of the study, its problem, and the objectives it seeks to achieve. The second chapter provides an overview of VGI and (OSM), as well as their roles in the Israeli-Palestinian context. The third chapter outlines the methodology followed, the analysis procedures, and the tools used. The fourth chapter presents analysis's results. While, fifth Chapter discusses the analysis results in the relation to the hypotheses and compares them with previous studies. Finally, the recommendations and limitations are included in the sixth chapter.

1.2 Problem Statement

Volunteered geographic information is a special case of the larger phenomenon known as user-generated content (UGC), which empowers individuals to become more involved in activities such as urban planning and mapping.

Recently, volunteer geographic platforms such as OpenStreetMap (OSM) have become increasingly widespread worldwide. In the case of West Bank, which is considered a conflict region, the research aims to assess the coverage of OpenStreetMap data for historical sites in the West Bank by examining the contributions of both Palestinians and Israeli settlers to the documentation of historical sites on the OSM platform. It also seeks to explore the motivations behind each group's participation, as historical sites hold deep significance for the indigenous people and express their sense of belonging to this land.

1.3 Research Questions

- How do the contributions of Palestinians and Israeli settlers differ in documenting historical sites on the (OSM)?
- To what extent do these contributions align with or differ from the historical sites documented in official/governmental or academic records?
- What are the social and political implications of the contributions made by both Palestinians and Israeli settlers to the (OSM) in the West Bank?
- What is the level of awareness among Palestinians of the (OSM), and how do they

utilize it in their daily activities and in their various contexts?

1.4 Aims of study

- Assess the completeness and accuracy of the representation of historical sites on (OSM) in the West Bank.
- Evaluate the contributions of the Palestinians and settlers in mapping the historical sites on (OSM).
- Analyze the impact of social and political dynamics behind the contributions of both Palestinians and Israeli settlers on (OSM).
- Measure the role of (OSM) in Palestinians' lives by studying their level of awareness about the platform and the activities they use it for.

1.5 Importance of the study

The study has many important implications, the most important is:

First, it assesses the (OSM) data coverage for historical sites in the West Bank, helping users understand strengths and weaknesses of (OSM) platform and make informed decisions about its suitability for use in different applications.

Second, the study spotlights the importance of community participation in digital mapping, which provides the accuracy of spatial data and the preservation of cultural heritage.

Third, this thesis examines how social and political dynamics impact historical sites in conflict regions, documenting historical sites in the West Bank on open platforms such as (OSM) affects narratives related to heritage, ownership, and identity.

Fourth, this study raises awareness among the local community about the importance of (OSM) data and the need to document and preserve historical sites.

1.6 Hypotheses of study

H1: Palestinians participated in documenting most of the historical sites on (OSM) platform in the West Bank

H2: The number of historical sites documented on (OSM) in the West Bank aligns with their actual presence on the ground and with records from government and academic sources.

H3: The social and political context significantly impacts the labeling and prioritization of historical sites, resulting in biases in (OSM) documentation that reflect competing narratives in the West Bank.

H4: Limited digital engagement within the Palestinian community contribute to the underrepresentation of Palestinian historical sites on the (OSM) platform.

1.7 Study area

The West Bank, situated in the Middle East at latitude 31°56'24.00" N, longitude 35°13'12.00" E (*West Bank - OpenStreetMap Wiki*, n.d.). Geographically, it is located west of the Jordan River, hence its name. Its terrain is characterized by diverse landscapes, ranging from fertile valleys to rugged hills and desert expanses.

West Bank is a region of significant geopolitical and cultural importance. its strategic location at the crossroads of Africa, Asia, and Europe has historically made it a center of trade, migration, and conflict. Its unique position continues to shape its political dynamics and make it a compelling area for academic study, particularly in fields such as geopolitics, sociology, and environmental studies (*West Bank - 2021 World Factbook Archive*, n.d.)

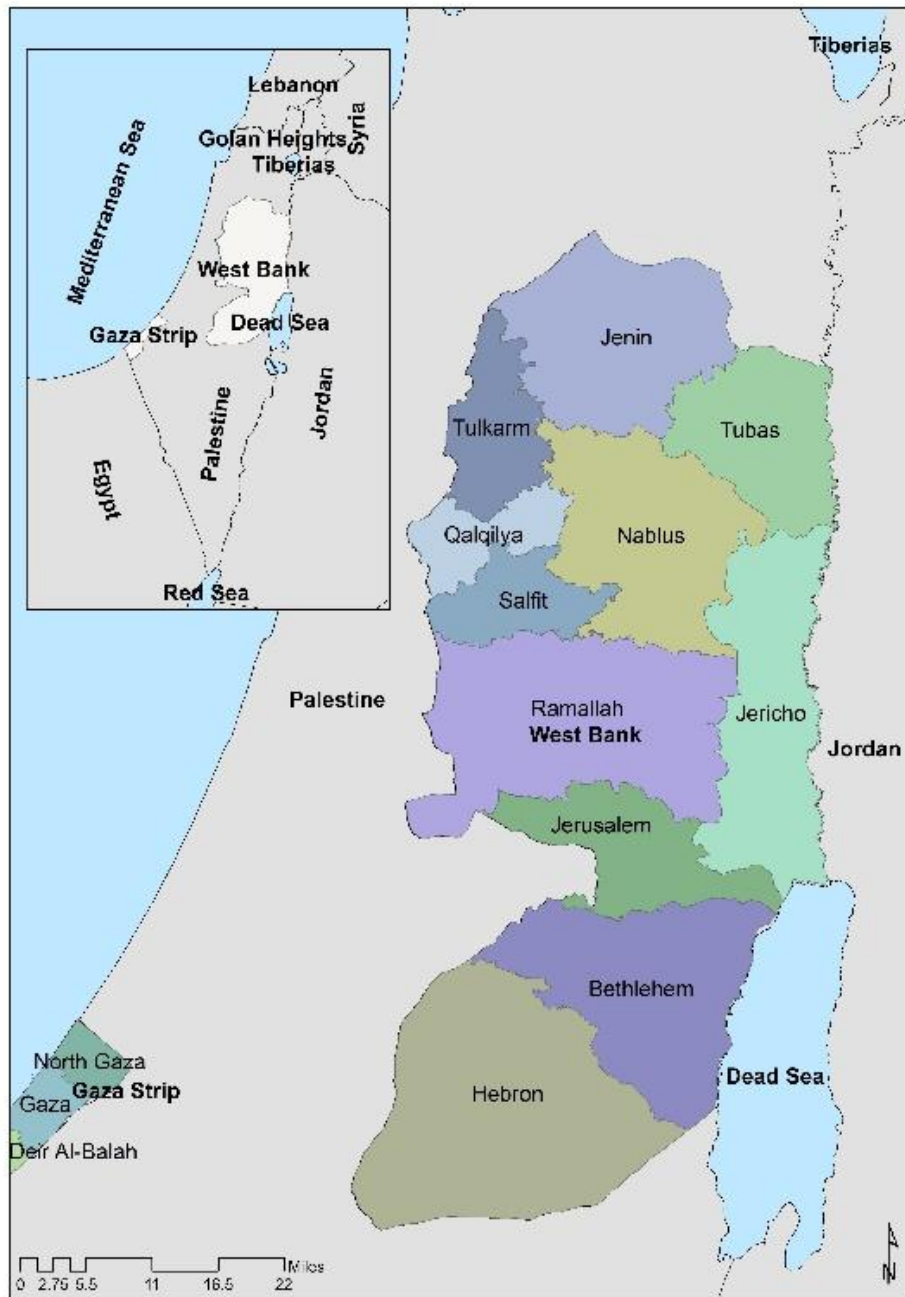
The geopolitical situation:

After the Nakba, the West Bank came under Jordanian rule. The East Bank (Jordan) and West Bank (Palestine) were united following the Jericho Conference in 1951, and residents of the West Bank were considered Jordanian citizens. However, in 1967, Israel occupied the West Bank during the six-day war.

Through the Oslo Accords, concluded between 1995 and 1993, the Palestinian Authority was established as an administrative entity tasked with administering Palestinian affairs in the West Bank and Gaza. According to these agreements, the West Bank was divided into three areas: (A) under full Palestinian administration; (B) with Palestinian civil administration and Israeli security; and (C) under full Israeli control, with the latter comprising the majority of the area. However, the Authority was unable to administer the areas under its control, and the West Bank remained subject to the occupation's control, settlement policies, imposed restrictions, the annexation of Palestinian lands, their isolation from one another, and economic dependence (*West Bank | History, Population, Map, Settlements, & Facts | Britannica, 2024*).

Figure 1

West Bank location



Note. Ministry of Local Government (Geomolg, *n.d.*) and OCHA services dataset (State of Palestine - Subnational Administrative Boundaries | Humanitarian Dataset | HDX, *n.d.*), adapted by the researcher

1.8 Literature Review

1.9 Volunteered Geographic Information (VGI)

1.9.1 Concept of VGI

Volunteered Geographic Information (VGI) is a form of georeferenced citizen science, a term coined by Michael Goodchild, referring to the collection of geographic data by individuals with limited formal qualifications using tools such as smartphones, GPS, and others technologies. a function that has been reserved to official agencies for centuries. Ordinary citizens, despite being untrained, often volunteer and become partners in the construction of spatial knowledge. This is known as "user-generated content" in the geospatial field (Goodchild, 2007).

1.9.2 Importance and Applications of VGI

One of the most important advantages of VGI is that it overcomes the limitations of traditional mapping by involving local communities, especially in areas that are difficult for official surveyors to access or that suffer from a lack of documentation, which contributes to promoting geographic justice (Haklay, 2010). It is also a time-efficient tool during disasters, offering near-real-time updates (Zook et al., 2010). Thus, VGI can be used for a variety of applications, including humanitarian relief and environmental monitoring.

The Humanitarian Open Street Team (HOT) has demonstrated the value of VGI in mapping vulnerable areas to coordinate disaster response. For example, when, volunteer mapper provided critical updates that facilitated rescue operations and resources allocation in the 2010 Haiti earthquake (Meier, 2012). VGI data can also be used to protect indigenous lands and monitor illegal logging, thus preserving their rights and preventing potential property rights violations and illegal deforestation (Fritz et al., 2009). Citizen documentation on land use changes, deforestation, and urban expansion has also complemented traditional satellite imagery and official surveys.

1.9.3 VGI Challenges

Despite its many benefits, VGI faces several challenges, particularly accuracy and reliability, as it is often generated by untrained individuals. The absence of standardized protocols for data collection and documentation limits its use in research or by official institutions. Other issues related to privacy, ethics, and both spatial and social bias are also considered (Fast, 2024).

1.10 OpenStreetMap (OSM) Overview

Imagine a world where anyone, regardless of their location or resources, could map their surroundings. That vision became a reality in 2004 when Steve Coast, a British innovator, introduced OpenStreetMap (OSM) to the world. The product of a collaborative project that began in Britain when the (*Ordnance Survey | Great Britain's National Mapping Service*, n.d.) was restricting the free sharing of geospatial data, (OSM) emerged as a groundbreaking initiative to democratize mapping (Antoniou, 2017).

The basic idea was based on a simple principle: creating a free, editable map of the world based on user contributions, who would collectively collect, document, and edit geospatial data. It wasn't long before this concept took root. The OSM Foundation was founded in 2006 to support this endeavor, inviting individuals and organizations alike to contribute to documenting landmarks, cultural sites, and other artifacts, ensuring that mapping is accessible to all and helping to grow the platform (Antoniou, 2017).

1.10.1 (OSM) Importance

Because OSM is a volunteer-based spatial database, it harnesses local expertise to produce high-quality geospatial data. Volunteers have demonstrated exceptional accuracy-exceeding 92% on several tasks, such as classifying roads from high-resolution aerial images, often outperforming professional surveyors who lack this knowledge. This outstanding performance has helped the platform expand rapidly (Mooney & Corcoran, 2012).

In regions marked by political sensitivities, (OSM) provides a unique forum for data collection in contested areas. Although designed as a neutral platform, the mapping of such regions often reveals underlying biases and competing narratives among contributors, reflecting the complex interplay of human geography and geopolitics (Glasze & Perkins, 2015).

1.10.2 (OSM) Challenges

Despite its open collaboration framework, participation in (OSM) remains highly unequal. A small, active group of registered users drives most contributions and decision-making, while many potential contributors either do not register or contribute only minimally. Moreover, the contributor base tends to be affluent and well-educated, primarily from the Northern Hemisphere, which leads to notable disparities in geodata density. For instance, in Jerusalem, mapping density is significantly higher in neighborhoods predominantly populated by secular Jews compared to those mainly inhabited by Orthodox Jews and Palestinians (Glasze & Perkins, 2015).

1.10.3 How Does (OSM) Work?

(OSM) operates as a decentralized, user-driven platform that harnesses the power of volunteer contributions to create a comprehensive global map. The process begins with data collection, where individuals from diverse backgrounds using GPS devices, satellite imagery, or simply their local knowledge contribute geographic information. These contributions cover a wide range of features, including roads, buildings, parks, and places of worship (Ramm, 2011).

To represent real-world geographic features accurately, (OSM) employs a structured data model comprising three primary object types: nodes, ways, and relations. Nodes capture specific point locations defined by latitude and longitude coordinates. Ways represent linear features such as roads and also form polygons to delineate areas, while relations define logical or geographic relationships among objects. Each object is further enriched with spatial attributes stored as flexible tag/value pairs, which include details such as version numbers, editor identifiers, and timestamps (Mooney & Corcoran, 2012), (Neis & Zipf, 2012).

Figure 2

OSM Elements



Note: Image source (OpenStreetMap Wiki, n.d.)

After data collection, data can be refined through an editing process using simple tools. Beginner users typically use the iD Editor, a web-based interface, in contrast, advanced users often prefer the Java OpenStreetMap Editor (J(OSM)) for more complex tasks (Haklay, 2010).

Finally, through a community-driven validation process the accuracy and reliability of the map are ensured. The data quality is enhanced by continuous reviewing and refining via discussions and feedback for contributions, which provides a collaborative environment (Neis & Zipf, 2012).

1.11 OpenStreetMap in Contested Regions

Imagine standing at the intersection of history and technology, where a map is more than a navigational tool. It transforms into a canvas, bearing the marks of political conflicts, cultural identities, and historical legacies. This is the complexity of mapping contested regions in platforms like (OSM), where every boundary and tag carry a story and sometimes, a conflict.

Now imagine a vibrant community of cartographers, each cartographer passionately contributing to OSM. But within this collaborative space, a clash of ideologies arises. The map itself can become a battleground due to frequent updates, retractions, and contentious arguments over labeling rules. These disputes not only affect the stability of the data but also reflect tensions on the ground. The open nature of OSM's labeling system exacerbates these disputes, as contributors may interpret and assign label values differently. The OSM Data Working Group intervenes to arbitrate and resolve disputes related to particularly controversial labeling, protecting data integrity in the process (Mooney & Corcoran, 2014).

Examples of conflict zones include:

1. Israel and the Palestinian Territories, where each side draws maps according to its own nationalist vision. A (Bittner, 2017b) study found that the Israeli OSM is similar to OSM communities in Europe, making a collective effort to update geographic data. On the other hand, the Palestinians rely heavily on ad hoc mapping efforts led by humanitarian organizations.
2. Kashmir, a disputed area between India and Pakistan, where OSM tends to reflect the Indian perspective of the border. The territorial border between Pakistan and Kashmir appears thicker than the border between the territories administered by India. In response, some internet users claimed that the map depicts Pakistani-controlled areas as international territory, while Indian-controlled areas appear to be under India's legitimate sovereignty (OpenStreetMap Community, 2021).
3. The Ukraine-Russia War: The Ukrainian OSM community has appealed to volunteers to refrain from modifying the Ukrainian map until the war is over. Updating the locations of essential infrastructure facilities may be useful to Ukrainians, but the Russian military can also easily access this information (OpenStreetMap Wiki, 2022).

The challenges do not stop there. Legal and ethical difficulties also affect mapping efforts. For example, the difficulty of describing a disputed area: does a particular geographic name support one viewpoint over another? The OSM contributors must approach these questions carefully following the OSM guidelines while avoiding inadvertently endorsing controversial claims (Elwood et al., 2012).

The ethical challenges of mapping disputed territories on open-source platforms like OSM may legitimize one narrative over another (Glasze & Perkins, 2015). These challenges lie in contributors' decisions about place names, boundaries, and classifications. For example, in the West Bank, labeling a site in Hebrew or Arabic not only reflects linguistic preference but may also indicate political bias. This raises ethical questions about the neutrality of these open platforms, as OSM's "ground truth" model may privilege Israeli settlers, who often enjoy greater freedom of movement than Palestinians, who face restrictions (Bittner, 2017a).

Finally, the physical and informational barriers facing areas affected by current conflicts or military confrontations, such as poor internet access, difficulty of movement, or the constant threat of war, limit access to reliable field data and may result in errors or gaps in the map (Goodchild, 2007).

1.12 Historical Sites and Cultural Heritage in the West Bank

1.12.1 The Historical and Cultural Significance of the West Bank

The West Bank is home to numerous archaeological and historical sites dating back thousands of years. As a cradle of ancient civilizations and a crossroads of major world religions, the area has a deep historical root for diverse communities. These include sites such as Hebron, associated with biblical patriarchs, and Jericho, believed to be among the oldest continuously inhabited towns in the world. Also, it contains archaeological riches such as Sebastia, an ancient city associated with the Roman and Byzantine periods. And religious landmarks such as the Church of the Nativity in Bethlehem, revered by Christians as the birthplace of Jesus, and Al-Haram Al-Ibrahimi in Hebron, holy to both Muslims and Jews (Magness, 1998).

1.12.2 Divergent Narratives: Palestinian and Settler Perspectives

Historical sites in the West Bank are considered as contested areas. From the Palestinian perspective, these sites hold cultural and historical significance, underscoring the need to protect them as a symbol of identity and resilience. For example, Palestinian authorities and organizations such as UNESCO demand international recognition of these sites to highlight their historical significance and protect them from potential threats. On the other hand, Israeli settler narratives claim that these sites are linked to Jewish heritage through religious and historical claims. They have used biblical references to justify the construction of settlements in areas such as Hebron to support the idea of a continued Jewish presence. This view leads to the integration of these sites into Israeli national identity at the expense of local Palestinian heritage (Khalidi, 2013).

These historical sites are subject to some conflicts over how they are managed, accessed, and represented. For example, Al-Haram Al-Ibrahimi in Hebron, where both Preserving the historical and cultural heritage of the West Bank is difficult due to the political situation in the region, which includes restricted access to these areas, a lack of funding, and the destruction of heritage sites during conflicts, which pose significant challenges. International organizations have made numerous efforts to address these issues, such as UNESCO, which designated the Old City of Hebron as a World Heritage Site to help protect it. However, despite these efforts, tensions sometimes arise (Franceschini, 2024).

1.13 (OSM) in the West Bank

1.13.1 Awareness of (OSM) Among Palestinians

There are differences in levels of awareness of the OSM platform in Palestinian society. Awareness is more concentrated among urban residents and technology-savvy groups, while rural areas continue to suffer from a significant knowledge gap (Bittner, 2017b). The author attributes this to limited access to the internet and a lack of digital literacy programs.

1.13.2 Contributions of Palestinians to (OSM)

Palestinians have contributed to documentation on the OSM platform by recording local villages, historical landmarks, and vital infrastructure such as roads and water sources, a form of grassroots cartographic resistance (Participedia, n.d.). Palestinian cartographers often worked through local NGOs and community initiatives, documenting areas overlooked by official and commercial maps, particularly in Area C, which is under Israeli occupation (Bittner, 2017b).

Reasons for Lower Palestinian Contributions

Several barriers contribute to lower participation levels among Palestinians (Graham et al., 2014):

- **Technical Barriers:** Limited access to internet and digital devices lowers the ability of many Palestinians to engage with (OSM).
- **Sociopolitical Constraints:** Movement restrictions and political instability hinder data collection efforts in certain areas.
- **Resource Scarcity:** Unlike settler communities, many Palestinian contributors lack institutional support and funding for large-scale mapping initiatives.
- **Knowledge Gap:** the awareness of (OSM) and its potential remains uneven across Palestinian communities, which limits their participation.
- **Perceived Bias:** Some Palestinians may perceive open data platforms like (OSM) as being biased toward Israeli narratives, which could lead to mistrust and reluctance to contribute.

1.14 Israeli Contributions to (OSM)

Israelis have a high level of awareness of digital maps and mapping technologies, which helped them participate more on OSM. Israelis are developing organized initiatives aimed at disseminating and promoting digital mapping within their communities to further political and ideological goals (Graham et al., 2014).

Unlike the Palestinian, Israelis benefit from substantial institutional support, including government-sponsored programs and private organizations that provide training and resources for mapping efforts. This support increases their ability to contribute to (OSM) effectively (Bittner, 2017b).

1.14.1 Israeli mapping motivations

- Geopolitical Objectives: The goal of Israelis in the documentation process on OSM is geopolitical. By documenting cities, roads, and other infrastructure, Israelis aim to legitimize their presence in the conflict areas.
- Enhancing Community Infrastructure: Israelis use (OSM) to improve their communities. Accurate maps facilitate urban planning, emergency response, and transportation within their neighborhoods (Bittner, 2017b).

1.14.2 Israeli mapping practices and strategies

The mapping methodology employed by Israelis involves organized groups that map large areas with precision and detail, using advanced technological tools that provide high-quality data (Hirsch-Hoefler, 2020).

Israelis exploit contested lands by mapping these areas, particularly roads and land adjacent to Palestinian villages, highlighting their claims, marginalizing alternative viewpoints, and influencing the broader narrative on (OSM) (Bittner, 2017b).

1.14.3 Geopolitical Implications of Israeli Contributions

Israeli contributions to open platforms such as OSM held significant geopolitical implications. By asserting their presence and mapping infrastructure, they contribute to reinforcing their claims over the land (Hirsch-Hoefler, 2020), raising concerns about the platform's neutrality. Since contributions often reflect the perspectives and priorities of their contributors, OSM risks functioning as a medium for contested narratives rather than serving as an impartial tool for geographic information. (Graham et al., 2014).

1.15 Open Data and Representing Conflicting Narratives

Open data has become a tool for democratizing geographic information, enabling communities to contribute and share spatial data on such platforms. However, contributors have documented their political and regional perspectives, reflecting narratives of conflict (Stephens, 2013).

While these platforms provide an opportunity for marginalized communities to document their areas on digital maps, their neutrality and accuracy can't be guaranteed, especially when external contributors influence representations without local knowledge (Perkins et al., 2011).

The issue of multiple narratives in open data poses a significant challenge in achieving an objective representation of geographic reality. Open platforms have demonstrated that they can be a tool for negotiation rather than division, through participatory mapping initiatives that have shown promising results in promoting inclusivity and mutual understanding (Mccall & Dunn, 2012).

Contributors from technologically advanced regions are more likely to participate in the documentation process than marginalized communities, which disrupts the dynamics and representation of data on these platforms, leading to underrepresentation of marginalized communities and the entrenchment of informational inequalities (Graham et al., 2014).

This inequality is most evident in politically sensitive regions, where it manifests as a form of "cartographic aggression," where dominant groups manipulate map data to assert their territorial claims or suppress alternative narratives (Wood, 2008).

To address such inequalities, initiatives must be undertaken to build capacity and empower local contributors to document on such platforms. These efforts can foster a more balanced and representative mapping environment that supports a diversity of narratives, rather than reinforce existing power structures (Yang et al., 2023).

Chapter Two

Methodology

This chapter describes the methodology used to examine the contributions of both Palestinians and Israeli settlers in documenting historical sites, which helped in understanding the role of OSM documentation in contested regions. The research plan, including the study design, study population, procedures, and analysis plan, presented in this chapter.

2.1 Study Design

The study applied a quantitative approach, combining spatial analysis, which involved using Geographic Information System (GIS), analyzing historical sites metadata and survey responses. A few local exploratory interviews were carried out and included in the recommendations section as background insights for future research.

2.2 Study Population

The study population includes historical sites in the West Bank, which were used in the quantitative aspect besides Palestinian local population, who were participated in the questionnaire to measure their awareness of documenting historical sites on (OSM).

2.3 Study Sample

The study sample includes historical sites documented on (OSM) in the West Bank, and the metadata associated with these historical sites. The study sample also included 340 people from the West Bank population to carry out the questionnaire.

2.4 Instruments of study and validation indicators

1. Data Sources: Historical site data for the West Bank were downloaded from the (OSM) platform using the Geofabrik website (*Geofabrik Download Server*, n.d.). Additional spatial layers were obtained from the GeoMOLG database (*Geomolg*, n.d.).
2. GIS Tools: ArcMap 10.7 was utilized for spatial analysis, employing tools such as:
 - Select By Attributes: select features using an attribute query (*Using Select By Attributes—ArcMap / Documentation*, n.d.)
 - Clip (analysis): Extracts input features that overlay the clip features.

- Join data by location (spatially), joins the attributes of two layers based on the location of the features in the layers (*Introduction to Joins and Relates—ArcGIS Pro / Documentation*, n.d.).
 - Buffer (Analysis): Creates buffer polygons around input features to a specified distance (*Buffer (Analysis)—ArcGIS Pro / Documentation*, n.d.).
 - Kernel Density (Spatial Analyst): Calculates a magnitude-per-unit area from point or polyline features (*Kernel Density (Spatial Analyst)—ArcGIS Pro / Documentation*, n.d.).
 - Thiessen polygon tool, all points are triangulated into a triangulated irregular network (TIN), Where any location within the region is closer to its associated input point than any other input point (*Create Thiessen Polygons (Analysis)—ArcGIS Pro / Documentation*, n.d.).
3. Metadata: The metadata for historical sites was downloaded using the Overpass Turbo query tool (*Overpass Turbo*, n.d.). The data was extracted in XML format, allowing for detailed analysis of user contributions in Excel.
 4. Questionnaire: A Questionnaire was designed using Google Forms (*Google Forms*, n.d.), which included closed and open-ended questions to explore residents' awareness and perception of historical site documentation on (OSM).
 5. Interviews: were conducted with each of Tulkarm Municipality – Surveying and GIS Department and Tulkarm Directorate of Tourism and Antiquities.

Validation:

The spatial analysis was validated by comparing it with metadata analysis and survey responses of historical sites.

The metadata classification based on two criteria:

- Usernames were categorized by script (Arabic, Hebrew, Latin) Contributors with Arabic usernames were classified as Palestinian, while those with Hebrew usernames were classified as Israeli.
- language of textual tags (e.g., names or descriptions) was considered: sites tagged in Arabic were typically Palestinian, in Hebrew were Israeli.

Ambiguous or pseudonymous accounts were placed in the “Unknown” category to avoid misclassification.

2.5 Analysis Plan

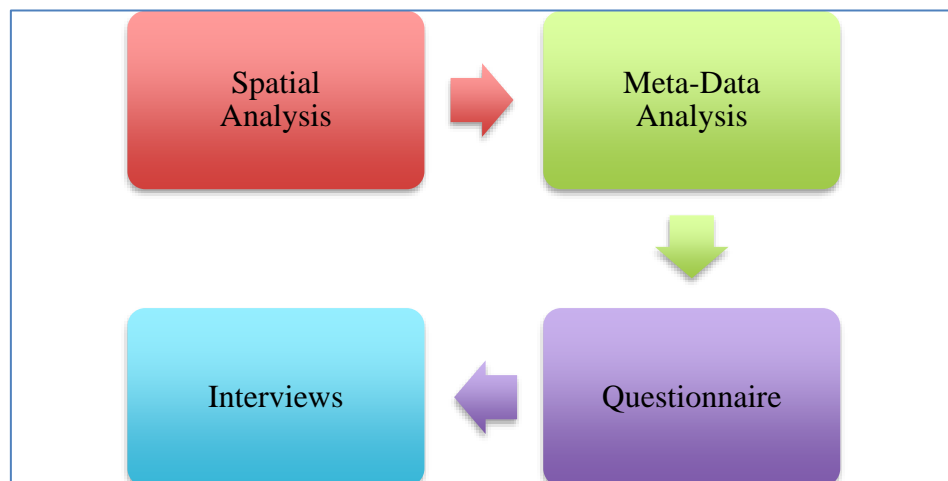
The analysis plan contains four stages.

Stage 1: Analyzing the historical sites documented on OSM by both Palestinians and Israeli settlers, including their number and locations within the West Bank, using ArcMap's spatial analysis tools.

Stage 2: Metadata analysis was used to identify contributors who documented historical sites on OSM and match their contributions with the results of the spatial analysis.

Stage 3: Palestinian awareness of OSM was measured using a questionnaire, which in turn provided an interpretation of the results of the spatial analysis and Metadata analysis.

Stage 4: Interviews were conducted to uncover the reasons for the lack of awareness about OSM in the Palestinian community and to discuss strategies for raising awareness and educating people about the importance of documenting information about OSM.



2.6 Study Procedures

1. Data Collection:

The data collection included several steps to gather the necessary information:

- Historical Sites Data: Data related to historical sites was downloaded from the (OSM) platform. By using Geofabrik website for downloading (OSM) data, and GeoMOLG website for downloading spatial data related to the West Bank.
- Metadata of Historical Sites: Metadata related to historical sites was extracted using Overpass Turbo, and the data was downloaded in XML format.
- Questionnaire Data: Data for the questionnaire was collected through an online survey published via the Facebook platform and personal connections. Google Forms was used to design the survey, targeting residents of the West Bank to gather their responses.

2. Data preparation:

- The data downloaded from (OSM) for Palestine and Israel were processed using ArcMap. The data was in the form of point and polygon features. Historical site data was extracted based on the following classifications (archaeological, castle, monument, monument, ruins) and placed in separate layers to complete the spatial analysis.
- As for the metadata, it was uploaded to Excel, where information about the contributors' locations, historical site names, and user names were extracted and placed in a separate table.
- The Questionnaire responses were collected and organized for quantitative analysis, and the interview transcripts were prepared for thematic analysis.

3. Data analysis:

Quantitative Analysis: This step included both the Spatial Analysis, the Metadata Analysis and the Questionnaire analysis.

Spatial Analysis: The spatial analysis was carried out using ArcMap 10.7 analytical tools, as follow:

- Clip Analysis and select by attribute: was used to prepare data for analysis, the historical sites located within the West Bank were extracted from the Geofabrik dataset, along with the Palestinian and Israeli services and amenities.

- Join data by location tools: which has been used many times during the analysis in order to combine the attribute from two spatial layers based on their location. It was first applied in the geopolitical analysis to calculate the number of the historical sites located within land classification according to Oslo Agreement. It was also used in the buffer analysis to count the number of services and amenities falling within each defined buffer zone.
- Buffer Analysis: to create buffer zones around the historical sites in different distances (0.5, 1, 2) km to quantify the number of Palestinian and Israeli services and amenities located within each buffer area.
- Kernel Density Analysis: was used to evaluate the spatial distribution of historical sites across the West Bank. to identify areas that have a high concentration of documented historical sites on OSM.
- Thiessen Polygon (Voronoi Diagram): was used to determine Palestinian localities and the Israeli settlements area of influence, to identify which historical sites fall under the influence of each group. And to do so Thiessen Polygon requires point data, the Palestinian localities were used in their existing point shape from the Geomolg dataset, while the Israeli settlements converted it to point format by using feature to point tool. Once both datasets were prepared, the Thiessen Polygon tool was applied to generate spatial boundaries for influence assessment.

Metadata Analysis: to carry out the metadata analysis, a sample of the historical sites metadata was downloaded using overpass turbo query in XML format. The data then was imported into Microsoft Excel to proceed with the analysis; the analysis followed several steps to classify the data:

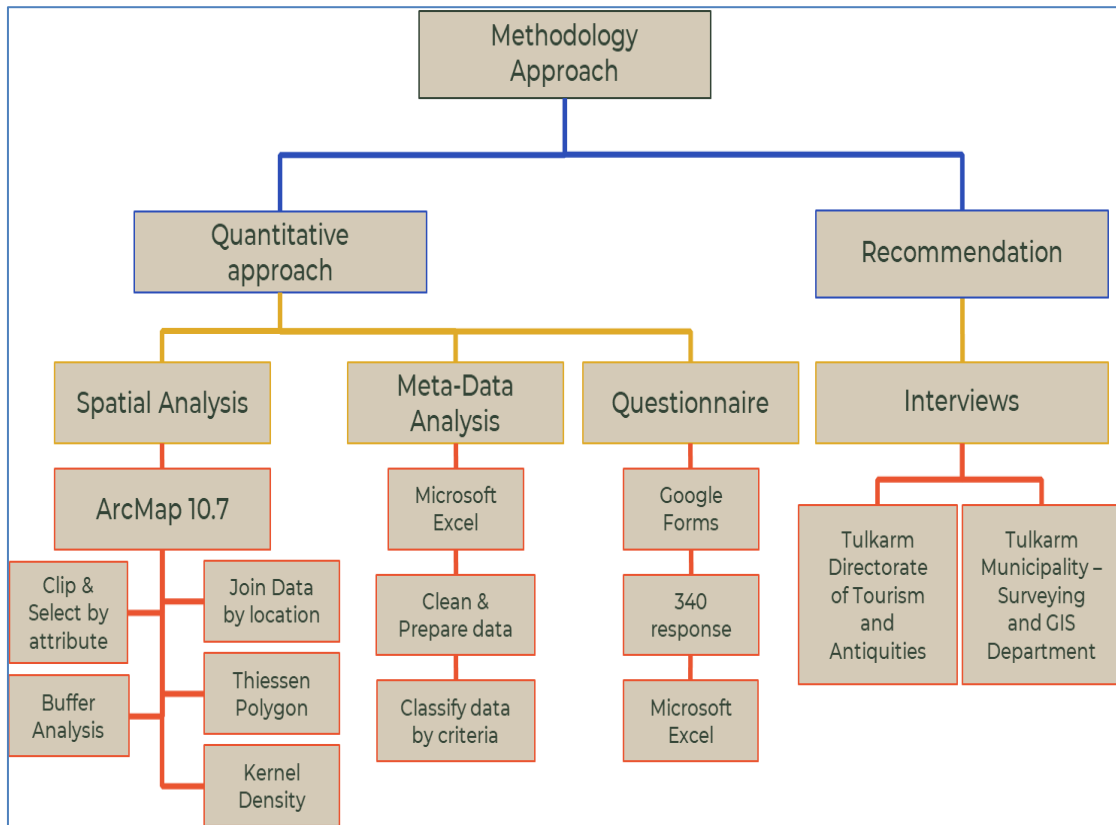
- Data Cleaning: unnecessary and incorrect data were removed.
- User Classification: contributors were classified manually based on language of their username (Arabic, Hebrew, English) and by type (individuals or organizations).
- Input Language: Language classification was done by observing character sets and common name structures. names containing Hebrew characters were tagged as Israeli contributors, while Arabic-script names were tagged as Palestinian.

Questionnaire: The survey aimed to assess the awareness within Palestinian society about the OSM platform, its applications, and its role in preserving historical sites. The survey was made by using Google Forms and shared across Facebook and various educational

groups. A sample of 340 responses was obtained. to calculate the responses percentages and generate tables and charts, the data were analyzed using Google Forms and Microsoft Excel.

Figure 2

Research Methodology



Chapter Three

Results and Discussion

This chapter presents the research outcomes resulting from the quantitative analysis. Each section is supplemented with maps, graphs, and tables, to enhance clarity and a comprehensive understanding of the findings.

3.1 Descriptive Statistics and Summary Reports

– Number of Historical Sites on OSM

Table 1

Historical sites counts and types

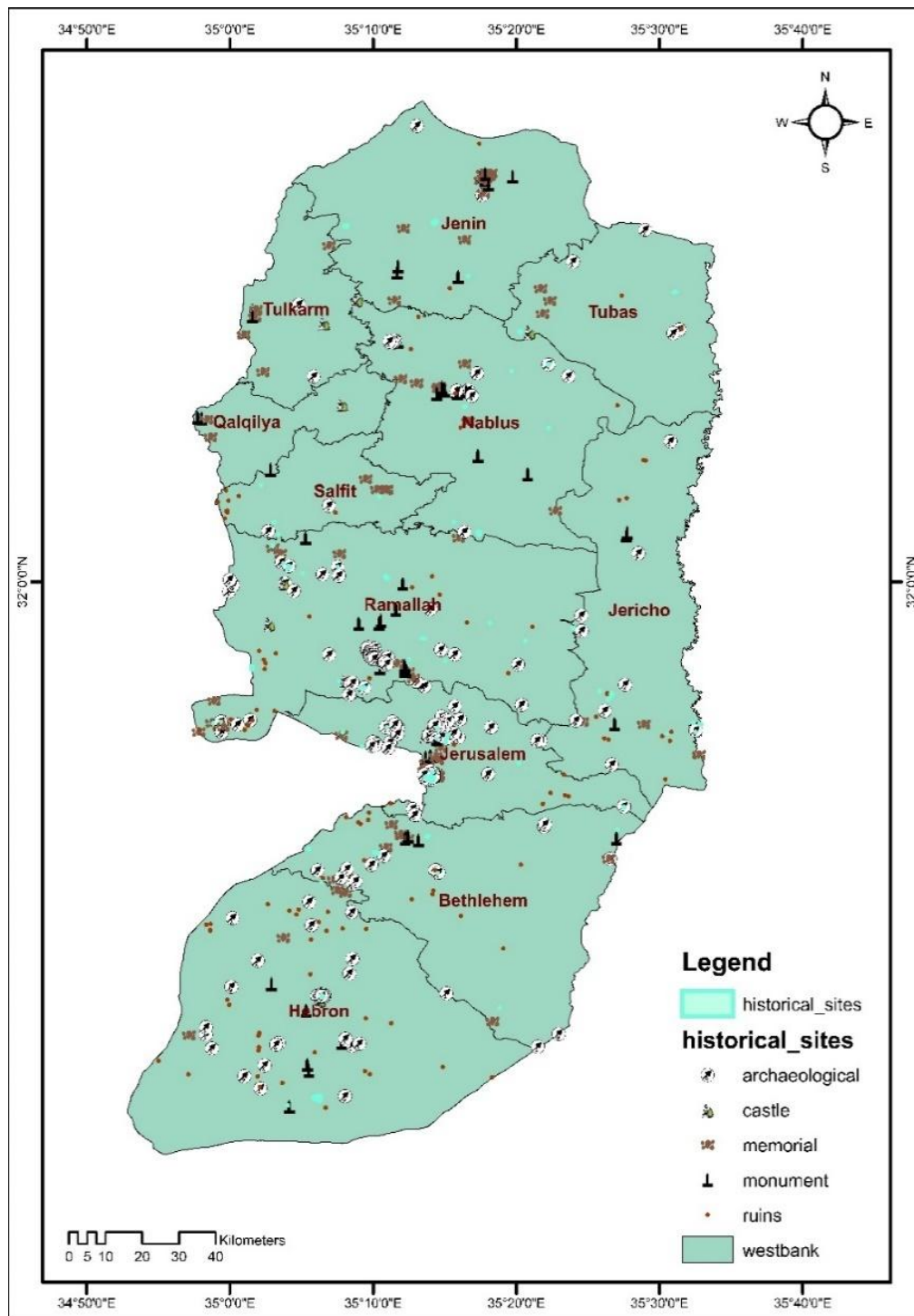
	Type	Point shape count	Polygon shape count
1	archaeological	268	66
2	castle	11	2
3	memorial	76	3
4	monument	57	4
5	ruins	138	28
	sum	550	103

The table above displays the distribution of tags for historical sites in the West Bank on OpenStreetMap. These tags are categorized based on their spatial characteristics into points and polygons. There are 550-point tags and 103 polygon tags, bringing the total number of documented historical site tags on OpenStreetMap for the West Bank to 653.

The map below illustrates the spatial distribution of historical sites across the West Bank.

Figure 3

Historical sites distribution in the West Bank



– **Number of Historical Sites in official and academic records**

The GeoMOLG is considered the official dataset for the West Bank, it contains a layer named “Archaeological Sites” it has 1928 sites documented as follow:

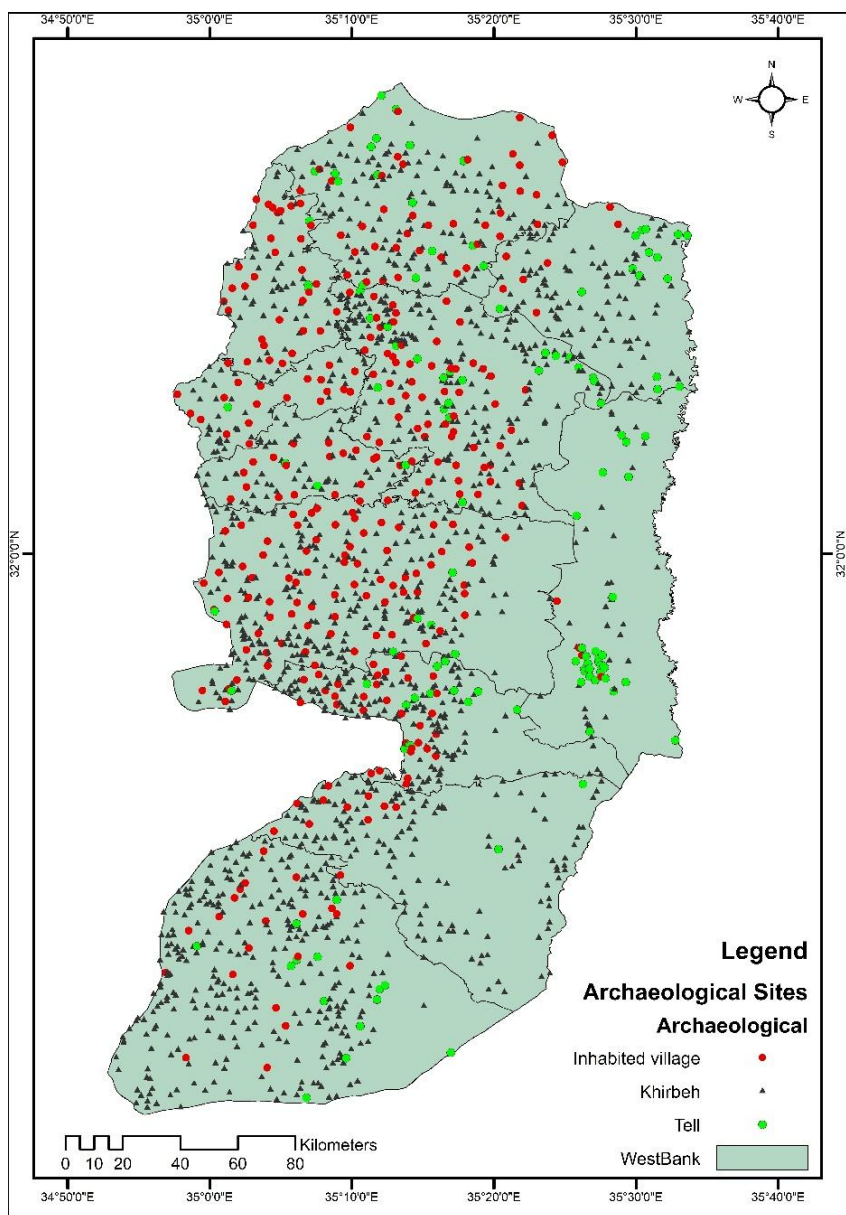
Table 2

Historical sites counts and types

	Type	count
1	Inhabited village	325
2	Khirbeh	1474
3	Tell	129
Sum		1928

Figure 4

GeoMOLG Archaeological Sites



3.1.1 Geopolitical Analysis

Table 3

Number of historical sites located within land classification according to Oslo agreement

Land classification by letters	Administrative divisions	Point shape count	Polygon shape count	Total	Percent (%)
Area A	Lands of Palestinian Administrative Control and Security Authority	115	11	126	19.30
Area B	Lands of Palestinian Administration Control and Israeli Security Control	63	19	82	12.56
Area C	Lands of Full Israeli Administration and Security Control	342	71	413	63.25
Area H1	Lands of Hebron under Palestinian Administration	3	0	3	0.46
Area H2	Lands of Hebron under Israeli Administration	25	3	28	4.29
Natural Reserves	Natural Reserves	2	0	2	0.31
Total		550	104	654	100%

For the geopolitical analysis, we identified and counted the historical sites located within the administrative divisions established by the Oslo Agreement, as well as those situated within the boundaries of Israeli colonial zones and their associated service areas.

As shown in Table No. 2, the majority of the historical sites are located within Area C (Lands of Full Israeli Administration and Security Control) with 342 sites identified as point shape and 71 sites identified as polygons, while 28 of the historical sites are located within area H2 (Lands of Hebron under Israeli Administration), with a percent equal to 67.5% of the total number of historical sites documented on the OpenStreetMap for the West Bank.

For the areas under Palestinian control, the number of historical sites reached 126 in the area A (Lands of Palestinian Administrative Control and Security Authority), and 3 sites located in area H1 (Lands of Hebron under Palestinian Administration) representing 19.7% of the historical sites documented on the OpenStreetMap for the West Bank.

Table No.3 shows the number of historical sites located within the colonial areas in the West Bank with total number reached up to 66 sites with a percent equal to 10.1% of the historical sites documented on the OpenStreetMap for the West Bank.

Table 4

Number of historical sites located within colonial areas

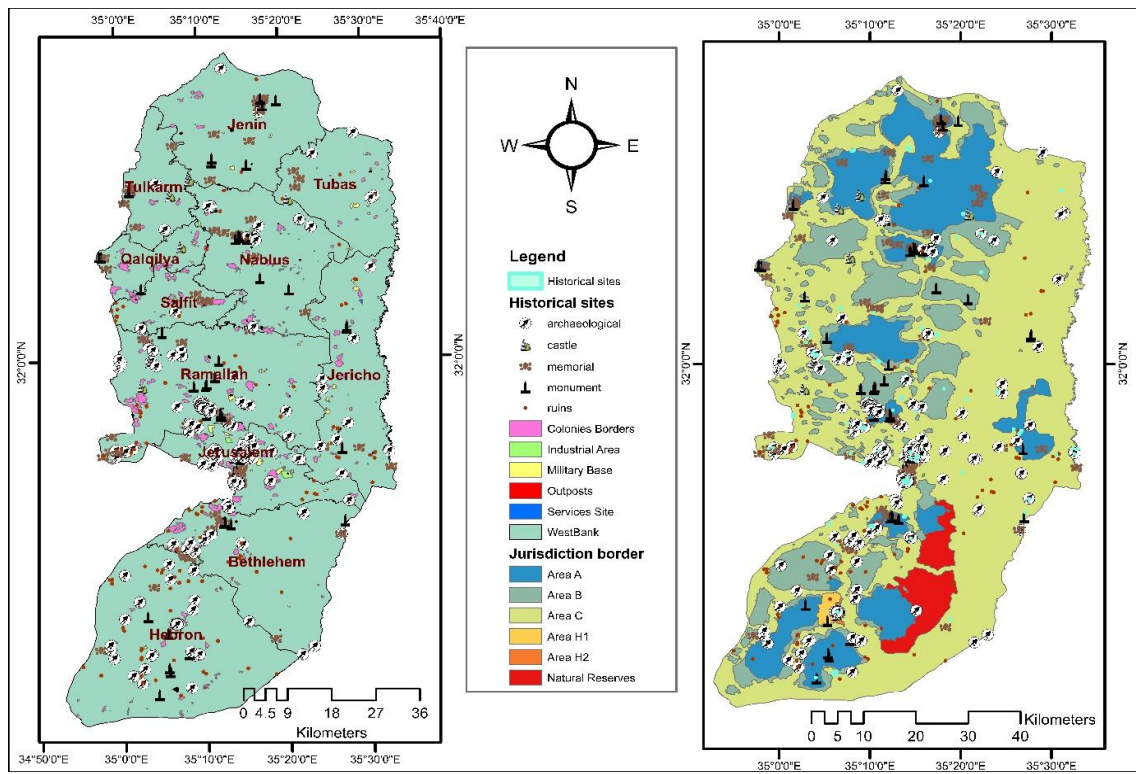
Colonial areas	Number of colonial areas	Number of historical sites
Colonies Borders	174	55
Military Base	93	5
Outposts	116	2
Industrial Area	25	2
Services Site	21	2
sum		66

The maps below show the distribution of historical sites for the geopolitical analysis, the map on the right illustrates the distribution of historical sites located Within land classification according to the Oslo agreement, it is evident that Area C occupies a large area from the West Bank and contain several of historical sites, also the map on the left shows the relation between Israeli colonial zones and their associated service with the historical sites, it shows many of historical sites located in or near these colonial areas.

The geopolitical analysis reveals that a significant number of the historical sites are situated within Israeli-controlled territories and near colonial sites. This indicates that many of the historical sites documented on OpenStreetMap for the West Bank were likely recorded by the Israeli side.

Figure 5

Historical sites located within land classification according to Oslo agreement and within colonial areas



3.1.2 Proximity Analysis

– Buffer zone analysis

It was used to calculate the number of Palestinian and Israeli settlers' services and amenities located within 0.5km, 1km, and 2km distances from the historical sites.

Figure 6

Palestinian services and amenities

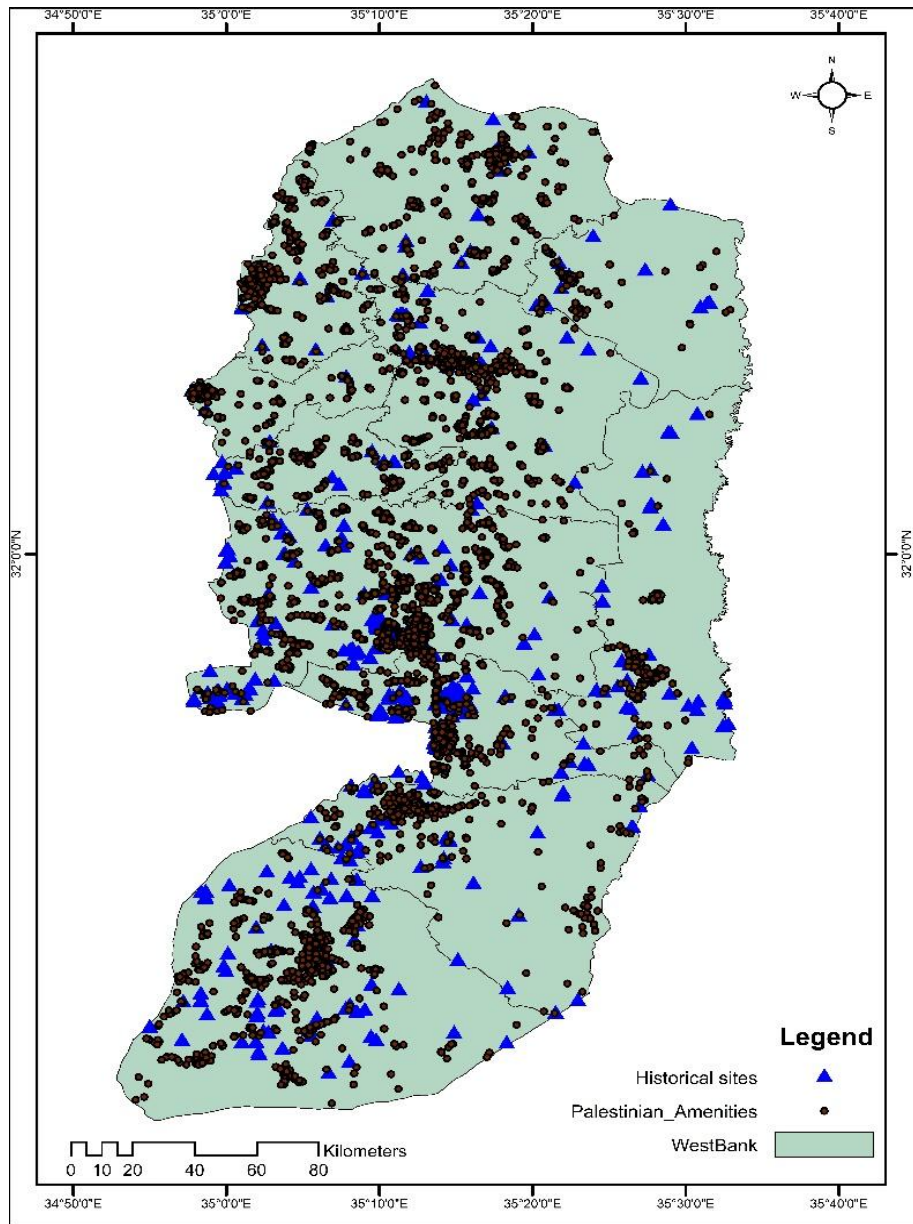


Table 5

Number of Palestinian and Israeli settlers' services and amenities

	Count
Palestinian Services & Amenities	11354
Settlers Services & Amenities	432

Appendix (B) shows the amenities type and count

Figure 7

Israeli settlers' services and amenities

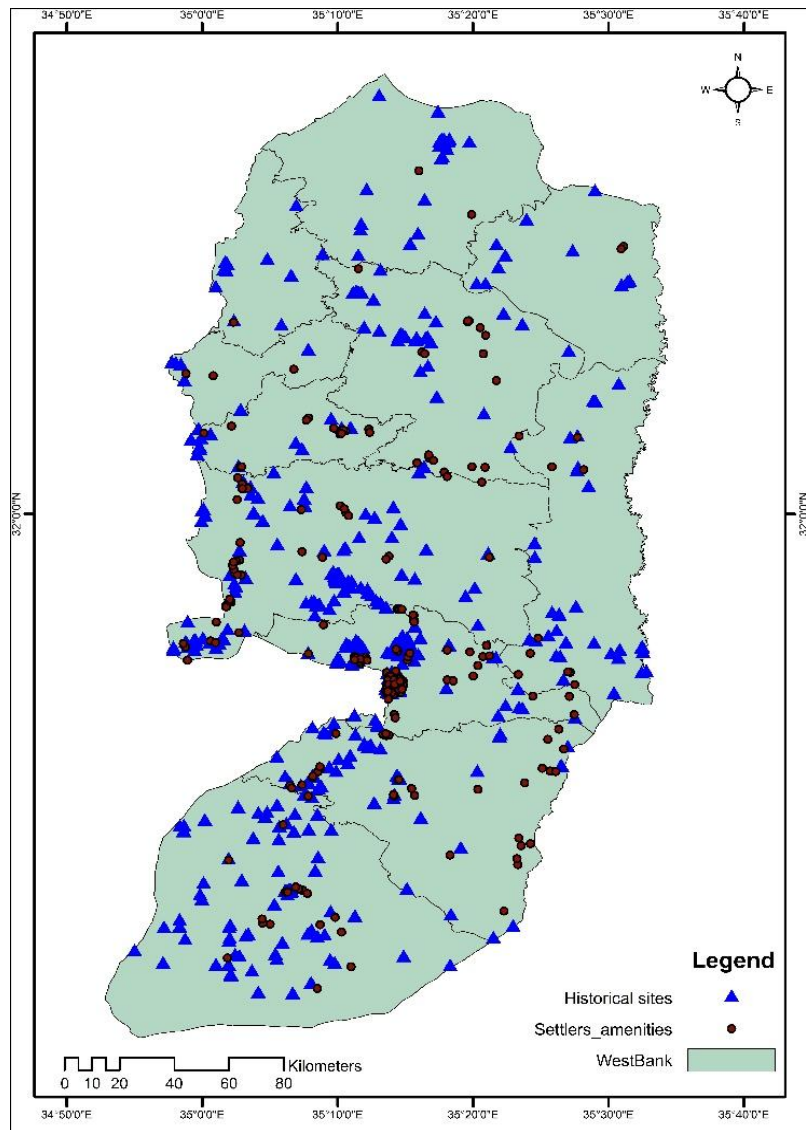


Table 6

Number of Palestinian and Israeli settlers' services and amenities located within different buffer zones

Buffer Distance	Palestinian Services & Amenities	Settlers Services & Amenities
Buffer_500m	3730	260
Buffer_1km	6476	391
Buffer_2km	11062	590

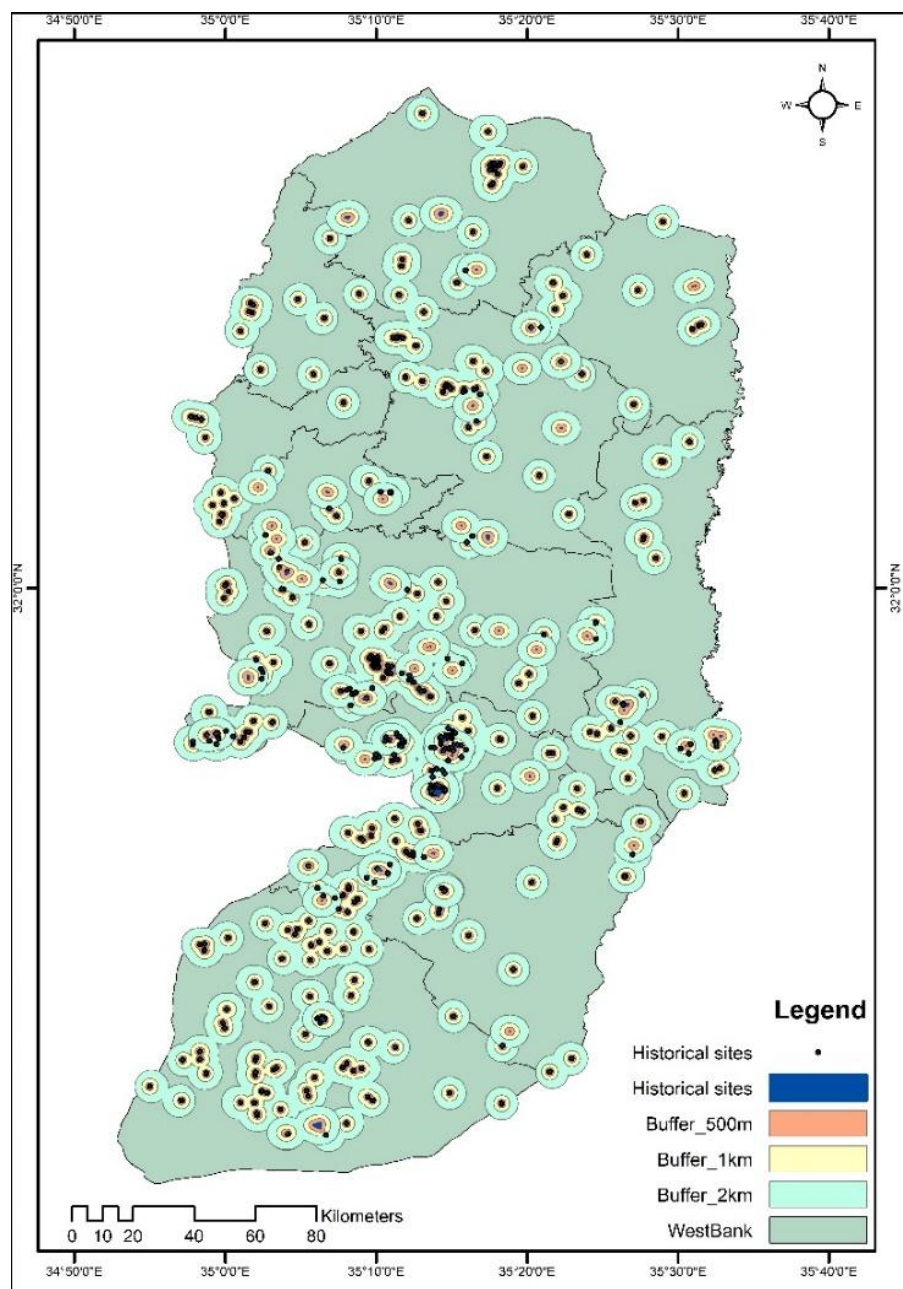
Table 7

Percentage of Palestinian and Israeli settlers' services and amenities located within different buffer zones

Buffer Distance	Palestinian (%)	Settlers (%)
500m	32.8%	60.19%
1km	57.03%	90.51%
2km	97.43%	136.57%

Figure 8

Different buffer zones of historical sites



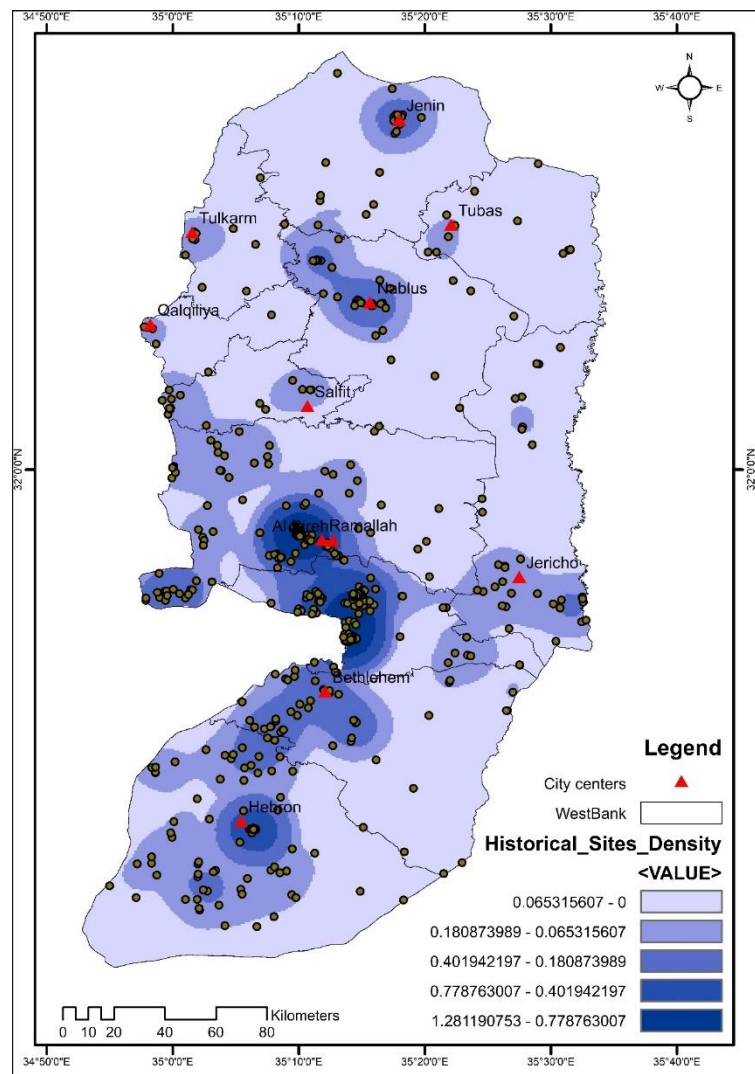
– **Historical sites density**

Kernel density analysis was used to estimate the spatial distribution of historical sites across the West Bank. The results ranged from 0-1.28 historical sites per square kilometer; the symbology was classified as follow:

- Very low density (0 - 0.06531560)
- Low density (0.065315607 - 0.180873989)
- Moderate density (0.180873989 - 0.401942197)
- High density (0.401942197 - 0.778763007)
- Very high density (0.778763007 - 1.281190753)

Figure 9

Historical sites density



– **Areas of influence**

Table 8

Number of historical sites located within the coverage areas of colonial and Palestinian

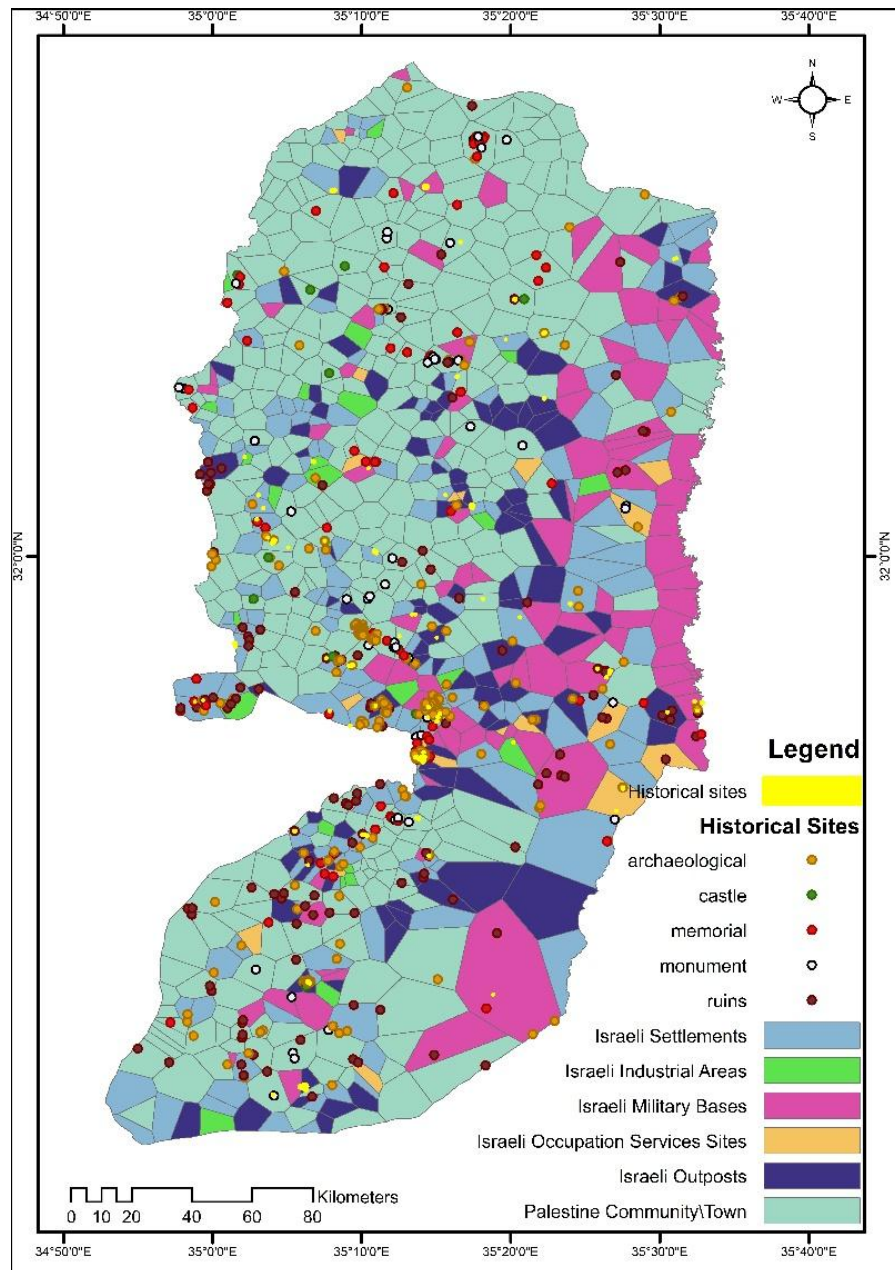
Layer name	Number	Number of historical sites
Colonies Borders	174	195
Military Base	93	69
Outposts	116	91
Industrial Area	25	12
Services Site	21	30
Colonial areas sum	429	397
Palestine Community\Town	377	266

As mentioned in Table 4, the number of historical sites located within the area of influence in the Israeli colonial is greater than the number located in the Palestinian area, where the number of historical sites within the Israeli colonial areas reached 397 which is equal to 60.8% of the historical sites, on the other hand the number of historical sites within the Palestinian area is 266 which is equal to 40.7% of the historical sites.

The map below shows the distribution of historical sites located within the coverage areas of the Israeli colonial area and the Palestinian areas. So, we conclude that the majority of historical sites documented on OpenStreetMap for the West Bank are coming from the Israeli side based on areas of influence analysis using the Thiessen polygon tool.

Figure 10

Historical sites located within the coverage areas of colonial and Palestinian areas



3.2 Metadata analysis

The metadata associated with historical sites in the West Bank includes the username, timestamp, and changeset. This data was retrieved using the Overpass Turbo tool from the OpenStreetMap (OSM) platform. Subsequently, the data was cleaned and prepared for extraction and further analysis.

The sample included 115 usernames, which were used as a standard to classify historical sites and determine which side contributed to their documentation on

OpenStreetMap (OSM). Four categories were established: Palestinian, Israeli, Organizations, and Unknown, each based on specific classification criteria.

The Palestinian category included usernames in Arabic or written in Arabic script; the Israeli category consisted of usernames in Hebrew or written in Hebrew script; the Organizations category encompassed usernames associated with recognized organizations; and finally, the Unknown category included usernames that didn't reveal their identity, as (OSM) does not require contributors to disclose personal information.

Table 9

Username classification categories

Category	Number
Palestinian	18
Israeli	13
Organizations	2
Unknown	17
total	50

The table above shows the number of contributors in each category. The number of Palestinian contributors was 18, the number of Israeli contributors was 13, the organization category contained two organizations, and finally, the unknown category contained 17 contributors.

It is noted that the total number of contributors classified into the four mentioned categories reached 50 out of 115. This is because the remaining usernames were excluded for specific reasons: 49 users documented sites that were not considered historical, leading to inaccurate data (Appendix [A]), while 16 users documented sites without providing any information about, the sites were considered invalid.

Table 10*Number of historical sites documented by each username*

Palestinian	No.	Israeli	No.	Organizations	No.	unknown	No.
Abdullah Dwikat	1	antoinetorrens	1	Alqudsmapping	1	l2caracteres	1
Ahmad Ayyoub	1	ardenviro	1	JumpStart International	12	b-unicycling	54
Anan shreth	1	ChillyDL	1			djex	1
Anas Aqel	1	Compositor	1			Eliyak	1
Ashraf Abulihya	1	davidmguest	1			GBAB	2
hanan zahran	2	Harel M	1			Guze79	2
Haytham Algoul	1	hatul	16			Ido Marom	5
Jawad Khamaysa	1	Johny Sabella	3			Kadubei	1
khaled abo hgi	1	Mosh Feu	1			LoneRikudo	1
Khaled Qarout	1	Moshe Eliyahu	1			office 1	1
nafee	1	Yuval Aboulafia	1			Petsamo	1
Mahmoud daraghmeh	2	טריסטרום	1			servilius_ahala	1
saadmaslamani	1	מבני הנביאים	1			SomeoneElse_ Revert	2
SafwatHalaby_bot	3					Tom3524634	1
Salah Abu Laban	1					sszv	8
waed	1					yrtimiD	1
ساميا	6					zstadler	9
محمد الشعبي ابوخليل	1						
total	27		29		13		92

The table above shows the username in each category and the number of the historical sites it documented on the OpenStreetMap for the West Bank. as we can see from the total number of the documented sites, the unknown categories have the highest number of the historical sites documented on the (OSM) due to username "b-unicycling" who has documented 54 historical sites; while searching the user profile on (OSM) it turns out he is a mapper since 2013, but didn't reveal its identity (*B-Unicycling / OpenStreetMap*, n.d.).

In the comparison between the Palestinians and the Israelis we can see that 27 sites were documented by the Palestinians and 29 sites were documented by the Israelis. When you make a ratio between the number of usernames and the number of documented sites, each Palestinian user made an average of 1.5 contributions on (OSM)

compared to 2.42 contributions on average for Israeli users.

However, a deeper analysis of the metadata shows that each Israeli user such as Hatul documented approximately 16 archaeological sites shown in appendix (A). These sites are all historical and include detailed descriptions and information.

In contrast, many Palestinian users were excluded from the analysis because they documented locations unrelated to historical sites, yet categorized them as such, as shown in appendix (A).

Most of the Palestinian contributors documented only one or two historical sites. Furthermore, many of the sites documented by Palestinian users were either not of significant historical importance or not historical sites at all.

3.3 Questionnaire

3.3.1 Overview

A total of 340 individuals participated in the survey, offering insights into their demographic backgrounds, knowledge of OpenStreetMap (OSM), and perceptions of documenting historical sites in the West Bank.

Questionnaire Structure:

The questionnaire consisted of four main sections, each designed to provide a comprehensive understanding of the participants' engagement with (OSM) and historical site documentation:

Section One: Demographic Information

- Collected data on gender, age, place of residence, and educational level.
- Aimed to provide a descriptive profile of respondents and identify potential relationships between demographic characteristics and other study elements.

Section Two: Awareness of OpenStreetMap (OSM)

- Assessed participants' familiarity with (OSM).
- Helped measure community awareness of the platform.

Section Three: Usage and Interaction with (OSM)

- Investigated how participants engage with the platform, including their level of contribution and use of mapping tools.

Section Four: Historical Site Documentation

- Examined participants' opinions on the accuracy and relevance of historical site data on (OSM).
- Explored the importance of (OSM) in preserving cultural and historical heritage and identified strengths and gaps in its coverage.

3.3.2 Questionnaire Analysis

1. Demographic Breakdown

The sample consisted of 220 males (64.7%) and 120 females (35.3%). Respondents' ages ranged from 18 to 70 years, with an average age of 28 years. The educational background of the participants was as follows:

- 74.4% (253 respondents) held a bachelor's degree,
- 11.2% (38 respondents) had a master's degree,
- 8.2% (28 respondents) had completed high school,
- 4.4% (15 respondents) held a diploma, and
- 1.8% (6 respondents) had a Ph.D.

Geographically, the majority of responses came from Tulkarm (45.3%), followed by Ramallah & Al-Bireh (17.4%), Nablus (12.4%), Jenin (6.5%), and other West Bank governorates.

2. Awareness and Usage of OpenStreetMap

Questionnaire data revealed a limited level of awareness about (OSM) among the participants:

- 75.9% (258 respondents) had never heard of OpenStreetMap.
- Only 24.1% (82 respondents) were familiar with the platform.

Similarly, 75.6% (257 respondents) were unaware that (OSM) could be used for cartographic documentation, while only 24.4% (83 respondents) knew this function.

Daily usage of (OSM) was minimal, with 88.8% (302 respondents) stating they do not use (OSM) regularly, and only 11.2% (38 respondents) reporting daily use.

3. Accuracy and Completeness of Historical Site Data

82.4% (280 respondents) stated that they do not know whether (OSM) provides accurate and updated information.

Only 13.8% (47 respondents) considered the data to be accurate, while 3.8% (18 respondents) found it inaccurate.

Additionally, 63.2% (215 respondents) were unsure if historical sites in the West Bank were well documented, while 29.1% (99 respondents) believed they were poorly documented, and only 7.6% (26 respondents) found the documentation satisfactory.

Despite these reservations, approximately half the sample (49.4%, n = 168) believed that (OSM) could serve as an educational tool to increase public awareness of historical sites. However, 46.2% (n= 157) remained uncertain, and 4.4% (n = 15) did not view (OSM) as suitable for this purpose.

4. Interest in Learning and Contributing

53.8% (183 respondents) expressed interest in learning how to contribute to (OSM), while 29.4% (100 respondents) were unsure, and 16.8% (57 respondents) were not interested. However, despite this interest, only 7% (24 respondents) provided specific suggestions for improving historical site documentation on (OSM).

3.3.3 Participants Suggestion

The suggestions provided by respondents were relatively limited in number, with only a small fraction (approximately 9%) expressing ideas for improving the use of (OSM) in documenting historical sites. These suggestions include:

1. **Increasing Public Awareness:** Several respondents emphasized the need to raise awareness about (OSM), positioning it as a viable alternative to mainstream platforms like Google Maps.
2. **Training and Capacity Building:** There were calls for organizing workshops or training sessions to help potential contributors understand how to effectively use (OSM). This would empower users to participate more actively in mapping historical and cultural sites.

3.3.4 Key Implications

The results highlight significant gaps in awareness and engagement with (OSM) among West Bank residents. While most respondents lack familiarity with (OSM), a majority are willing to learn how to contribute, suggesting potential for future training programs.

3.4 Interviews

First Interview: Tulkarm Municipality – Surveying and GIS Department.

The first interview was carried out at the Tulkarm Municipality’s Surveying and GIS Department on January 26, 2025, with Engineer Suha Bdeir and Engineer Rokon Bwaqna.

The first question addressed their knowledge of OpenStreetMap (OSM). Bdeir stated that she had no previous knowledge about this platform and had never heard of it before. In contrast, Bwaqna said that he had some familiarity with (OSM) from his university studies. Mentioning that Bdeir has been working at the municipality for 20 years, while Bwaqna has been there for approximately one year, this gives us insight into the generational knowledge gap, and suggests that younger engineers tend to be more aware of advancements in the field due to updated university curricula and a greater focusing on emerging technologies.

Based on the answers of the first question the second question was directed at Bwaqna, asking him if he had ever used (OSM) in his work. He responded that his knowledge was limited to a university research project and that he had not used it extensively. This underscores the minimal, if not nonexistent, use of such platforms by municipalities.

The third question was posed to Bdeir, asking why municipalities do not contribute to documentation on such platforms. She explained that municipalities face significant financial and technical constraints and lack awareness of modern technological advancements. She pointed out that the Surveying and GIS Department still relies on AutoCAD for mapping, with only occasional use of other software, such as ArcMap. She added, “I work on it voluntarily.”

The fourth question addressed the lack of awareness about (OSM) within Palestinian society. The interviewees attributed this to economic hardship, limited technological literacy, and the specialized expertise required for documentation.

Following this discussion, we explored possible ways to raise awareness about (OSM), emphasizing that the platform does not require extensive expertise—just the right tools. Bdeir expressed the municipality’s openness to the idea and its support for training workshops to educate people about (OSM) and how to contribute to it. However, she emphasized that experts in the field should take the initiative in organizing and leading such training sessions.

Second Interview: Tulkarm Directorate of Tourism and Antiquities.

On the same day, we conducted a second interview at the Tulkarm Directorate of Tourism and Antiquities with Director Abdul Salam Asia and Archaeology Department Head Moath Jbara.

When asked about their knowledge of (OSM), both respondents stated that they were unfamiliar with the platform.

The second question focused on the methods they use to document historical sites. Jbara explained that the Ministry of Local Government’s GeoMOLG website includes a special layer for archaeological sites. However, when I pointed out that this layer did not include all historical sites, he clarified that Palestinian law classifies old towns and ruins as archaeological sites.

When asked about the lack of documentation for sites in the West Bank, particularly in Area "C", Jbara attributed it to political instability and the absence of Israeli-issued permits allowing them to conduct documentation, despite these areas being Palestinian territories. He added that the primary focus remains on documenting sites in Areas "A" and "B".

Jbara further explained the process for mapping archaeological and historical sites:

- The municipality handles the structural planning.
- The Directorate of Tourism and Antiquities then reviews the plan and overlays the archaeological and historical site coordinates, officially mapping them.

The third question explored whether the Directorate could contribute to (OSM) documentation. Jbara found this challenging, stating that he was unfamiliar with (OSM) and had never used the platform.

The fourth and final question addressed the Directorate's future plans for preserving historical sites. Asia explained that there is awareness programs published on the Ministry of Tourism and Antiquities' website and social media platforms. Additionally, educational initiatives target schools and universities in collaboration with the Ministries of Education and Environment. He also mentioned their ongoing "Mobile Museum" project.

However, Asia noted that Palestinian society generally lacks interest in such initiatives. He concluded by saying:

"People don't even read the awareness campaigns we publish about these sites."

3.4 Discussion

This chapter discusses the findings of the study in relation to the research hypotheses and questions. It shows the role of both Palestinians and Israeli settlers in documenting historical sites on OpenStreetMap (OSM), the extent to which these contributions are consistent with official and academic records, and finally discusses the social and political implications of OpenStreetMap contributions in the West Bank. All this will be done in light of insights derived from spatial analysis, metadata analysis, and the questionnaire.

3.5 Evaluating Palestinian and Settler Contributions to OSM

Both spatial and metadata analyses revealed distinct patterns in the contributions between the Palestinians and Israelis settler in documenting historical sites on (OSM) in the West Bank.

The spatial analysis indicates that Israeli settlers dominate the documentation of historical sites on (OSM) in the West Bank with 63.25% of these sites located within Area C and 66 of these sites located within Israeli settlements or service zones. Thiessen polygons revealed that 397 of these sites fall under the Israeli side's influence.

To validate the spatial analysis, a metadata sample of documented historical sites on (OSM) was examined. The results confirmed that 13 contributors were from the Israeli settler community, with one user alone contributing 16 sites, while over 40 Palestinian users were excluded from the Palestinian contributor category, because they had misclassified non-historical sites as historical. A significant number of Palestinian

contributions consisted of roundabouts (e.g., Yahya Ayyash Roundabout, Battikha Roundabout, Clock Roundabout) (Appendix [A]), instead of historically significant locations, and most of these sites were situated within Areas A and B.

This reinforces the conclusion that the majority of historical site documentation originates from the Israeli settlement side.

A. Compared to Previous Research

These results are aligned with studies by Bittner (Bittner, 2017a, 2017b), who emphasized that mapping practices in contested region often reflect existing power structures, leading to an unequal representation of historical narratives. In (Carraro & Wissink, 2018) found that digital mapping in politically sensitive areas is often shaped by dominant political actors in that area, which in turn amplifies territorial claims rather than providing an objective record. This disparity in contributions mirrors the findings of (Haklay, 2010), who emphasized that participatory mapping platforms tend to exhibit biases influenced by differences in technological access and contributor engagement.

3.6 OSM Contribution similarity with Official and Academic Records

The analysis of historical sites reveals that the number has reached to 653 sites on (OSM), with 60% falling under the Israeli influence. When compared it to the 1,914 historical sites recorded in the 2017 Palestinian Central Bureau of Statistics (PCBS) (عدد المواقع الأثرية في فلسطين حسب المحافظة □ 2017, n.d.) for the West Bank, a noticeable difference in the number of sites between the (OSM) platform's historical sites and the official records is found.

The metadata analysis highlights that (OSM) contributors have documented many smaller cultural sites that were overlooked in official records. This variation underscores the participatory nature of (OSM), where contributors prioritize sites based on personal, or cultural significance rather than adhering to academic or governmental classification criteria.

Additionally, official records show that documented historical sites are primarily concentrated in Areas A and B. An interview with a tourism and antiquities professional revealed two key factors contributing to this pattern:

- a) Priority is given to sites in Areas A and B, where documentation efforts are more feasible.
- b) Restrictions in Area C prevent official documentation efforts, as obtaining permits for fieldwork in these areas is not possible.

The study confirms significant differences between (OSM) documentation and official records, which demonstrates several points:

- a) Participatory Nature of (OSM): (OSM) follows a bottom-up approach, relying on local residents for documentation.
- b) Use in Conflict Areas: In politically contested regions, (OSM) is often used to document sites that reinforce specific historical or territorial narratives.
- c) Need for Increased Contributions: While (OSM) is a valuable resource, it requires more contributions to improve data accuracy, completeness, and awareness.

Comparison with Previous Research

From the previous literature review, we can see that (Goodchild, 2007) supports these results who discussed that (VGI) is in its nature limited by the interests and capabilities of contributors, often resulting in incomplete datasets. Moreover, (Haklay, 2010) noted that in politically contested regions, digital maps are used more as tools for supporting specific narratives rather than be neutral documentation tool. (Graham et al., 2014) found that digital mapping in conflict regions is influenced by dominant geopolitical narratives, like the contributions of digital maps in the West Bank.

3.7 Sociopolitical Implications of OSM Contributions

The voluntary nature of the (OSM) platform allows contributors to share their perspectives and biases in mapping. Because the West Bank is considered a conflict zone, contributions have significant social and political implications, shaping historical narratives and influencing territorial claims.

- a) Promoting Competing Regional Narratives: Digital mapping plays an important role in contested regions. (OSM) tool helps in asserting historical and political claims. From this point, Israeli settlers' contributions to documenting historical sites in the West Bank reinforce Zionist narratives.
- b) Uneven Representation and Digital Marginalization: The study showed a difference in contributions between Palestinians and Israeli settlers to documenting historical

sites on OSM. The percentage of historical sites documented by Palestinians is small, due to limited awareness of the use of open digital mapping tools within Palestinian communities. As a result, Palestinian historical narratives are marginalized.

- c) Preserving Heritage and Culture: historical sites documented on open digital platforms gain greater visibility and recognition, which in turn increase their chances of being protected and incorporated into tourism and heritage programs. Conversely, sites that remain undocumented are at risk of neglect and erasure from digital and physical records.

Comparison with Previous Research

This result goes along with (Graham et al., 2014), who found that digital mapping rarely politically or culturally neutral but it used as a tool to legitimize territorial claims in contested regions. (Carraro & Wissink, 2018) highlighted that contributors' political and historical perspectives are shaped by digital mapping, further reinforcing geopolitical divisions.

3.8 Palestinian Awareness and Utilization of OSM

The study assessed the level of awareness among the Palestinian community of the OSM platform and its uses. The questionnaire results showed that Palestinians' awareness of the platform is low and their use of it remains limited, resulting in a decrease in the documentation of historical sites using OSM.

There are several main factors contributing to this lack of participation:

- Lack of awareness: Many Palestinians are unaware of how to document on (OSM) platform or how to use it for practical applications.
- Lack of interest: Some individuals see the documentation of historical sites is perceived as less important compared to economic and political concerns.

Comparison with Previous Research

These results align with (Haklay, 2010), who emphasized that participation in digital mapping is linked to technological knowledge and internet access. Furthermore, (Goodchild, 2007) highlighted that without appropriate training and incentives, marginalized communities may struggle to contribute to digital mapping platforms.

Chapter Four

Conclusion

4.1 Conclusion

In conclusion, this thesis aimed to assess the historical sites documented on the OSM platform in the West Bank, by comparing the contributions of both Palestinians and Israeli settlers to documenting these sites, while exploring the social and political implications.

The study follows a quantitative approach, combining spatial analysis and Metadata, which helped analyze the data and answer the study's questions. The results of the analysis revealed a significant difference in the representation of historical sites on the OSM platform and those recorded in academic and official records. It also indicated that Israeli settlers participated more in documenting historical sites in the West Bank, particularly in Area C, where these sites were characterized by a high degree of detail and accuracy in metadata. In contrast, Palestinian participation was lower and often incorrectly documented, being largely concentrated in Areas A and B.

The social and political implications of these results affect heritage conservation and policy making. Digital maps are more than just geographical tools; they are also platforms for constructing contested regional narratives. Therefore, addressing digital illiteracy among Palestinians and encouraging their active participation in mapping initiatives is crucial to ensuring a more balanced and representative documentation of historical sites.

The practical importance of this study is highlighted in its discussion of the role of open platforms in conflict zones and the neutrality of these platforms by analyzing the historical sites documented on the OSM platform in the West Bank by both Palestinians and Israeli settlers. The study urges the empowerment of the Palestinian community to participate in digital mapping. This can be achieved through training workshops, awareness campaigns, and collaborations with NGOs and municipalities to enhance Palestinian presence on social media.

4.2 Limitations

- The lack of previous studies talking about OpenStreetMap in the Westbank.
- Incomplete official datasets for heritage and archaeological sites, affecting the ability to fully validate (OSM) contributions.

- Sampling Limitations in Metadata Analysis: The metadata analysis was conducted using a selected sample of historical sites, rather than the entire dataset. This sampling may not fully capture all variations in contributions across different geographic and political contexts.
- If there is a knowledge to more advanced tools (e.g., ArcGIS Pro, Python geospatial libraries), it would have been possible to run automated contributor classification.
- Survey Response Bias: Poor cooperation of people in answering the questionnaire.

4.3 Recommendations

- Enhancing Palestinian participation in documenting on volunteered geographic information platforms through:
 - First, training courses and workshops for the Palestinian community to raise awareness about the importance of documenting on these platforms.
 - Second, organizing training workshops to build the capacity of institutions specializing in the preservation of antiquities and heritage.
 - Third, Integrating digital mapping into educational curricula.
- Improving the accuracy and completeness of historical site data on VGI platforms:
 - First, by initiating a mechanism to verify the accuracy of historical site data by developing protocols to identify and correct errors.
 - Second, Community participation through forming a network of Palestinian volunteers, ensuring that documentation processes are organized.
- Cooperating with international organizations such as the Humanitarian OpenStreetMap team (HOT) and UNESCO to support mapping initiatives aimed at preserving Palestinian heritage.

4.4 Future Research Directions

- Exploring the Role of Social-Media in (OSM) Contributions.
- Investigate how social media platforms influence participation in (OSM) mapping and whether online campaigns can enhance documentation efforts in marginalized communities.
- Analyzing User Behavior and Motivations in (OSM) Contributions.
- Conduct qualitative research on the motivations, biases, and mapping behaviors of Palestinian and settler contributors to better understand decision-making in digital mapping.

List of Abbreviations

Abbreviation	Meaning
VGI	Volunteered geographic information
OSM	OpenStreetMap
UGC	User-generated content
GIS	Geographic Information System

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Appendices

Appendix A

Historical Sites Metadata

Google Drive link:

The following link contains the metadata related to historical sites

https://docs.google.com/spreadsheets/d/1UWnZBBp3rO4JzG00ru0KYH81RRZO_jLN/edit?usp=drive_link&oid=114950552775558263250&rtpof=true&sd=true

Table 11

A sample of users documented historical sites inaccurately

note	node.tag.A ttribute:k	node. tag.A ttribute: e:v	node .Attr tribute :id	node.A ttribute :lat	node.A ttribute :lon	node.Att tribute:ve rsion	node.Attri bute:times tamp	node. Attri bute:ch angese t	node.Attri bute:uid
histor ic	memorial	5078 4420 21	32.2 2420 56	35.244 3580	1	2017-09- 04T08:2 7:23Z	51710879	51827 85	Amjad Khader
name	شركة دار التملك العقاري	5078 4420 21	32.2 2420 56	35.244 3580	1	2017-09- 04T08:2 7:23Z	51710879	51827 85	Amjad Khader
name :ar	شركة دار التملك العقاري	5078 4420 21	32.2 2420 56	35.244 3580	1	2017-09- 04T08:2 7:23Z	51710879	51827 85	Amjad Khader
name :en	Dar Attamleek Alaqari Co.	5078 4420 21	32.2 2420 56	35.244 3580	1	2017-09- 04T08:2 7:23Z	51710879	51827 85	Amjad Khader
addr: street	شارع الشهيد أحمد خضر	6401 6545 85	32.2 3656 94	35.183 4915	1	2019-04- 13T02:0 5:09Z	69167203	51827 85	Amjad Khader
histor ic	castle	6401 6545 85	32.2 3656 94	35.183 4915	1	2019-04- 13T02:0 5:09Z	69167203	51827 85	Amjad Khader
name	منزل الشيخ خالد ابو	6401 6545	32.2 3656	35.183 4915	1	2019-04- 13T02:0	69167203	51827 85	Amjad Khader

	الأمجد	85	94			5:09Z			
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		6545	3656	4915	1	13T02:0	69167203		Khader
		85	94			5:09Z		85	
histor ic	castle	8410	32.1	35.252		2021-02-		10829	Anan
		3770	3829	2985	1	10T01:4	99006174	705	Muhamma d
		17	85			7:59Z			
name	منزل رجل الأعمال عنان عودة	8410	32.1	35.252		2021-02-		10829	Anan
		3770	3829	2985	1	10T01:4	99006174	705	Muhamma d
		17	85			7:59Z			
name :en	Anan Odeh Home	8410	32.1	35.252		2021-02-		10829	Anan
		3770	3829	2985	1	10T01:4	99006174	705	Muhamma d
		17	85			7:59Z			
histor ic	castle	8410	32.1	35.253		2021-02-		10829	Anan
		4211	4093	1925	1	10T02:2	99007051	705	Muhamma d
		17	53			8:24Z			
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		4211	4093	1925	1	10T02:2	99007051	705	Muhamma d
		17	53			8:24Z			
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Table 12

A sample of how Israeli user's documents historical sites

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name:h e	חורבת אל- מפג'ר	432338 360	31.881 8828	35.459 9692		6	2021- 06- 27T09: 20:30Z	107028 503	686490	hatul
source	http://e n.wikip edia.or g/wiki/ Hisham	432338 360	31.881 8828	35.459 9692		6	2021- 06- 27T09: 20:30Z	107028 503	686490	hatul

	%27s_								
	Palace								
wikidata	Q2456	432338	31.881	35.459	6	2021-06-27T09:20:30Z	107028503	686490	hatul
a	319	360	8828	9692					
wikipedia	ה'רב ת אל מפג'ר	432338	31.881	35.459	6	2021-06-27T09:20:30Z	107028503	686490	hatul
he		360	8828	9692					
wikipedia	ה'רב ת אל מפג'ר	432338	31.881	35.459	6	2021-06-27T09:20:30Z	107028503	686490	hatul
he		360	8828	9692					
descriptions	המקום הרוס כמעט לגמרי, אבל הנוף יפה.	271277	32.337	35.255	3	2024-04-08T20:55:37Z	149752710	686490	hatul
ion		4083	1146	8238					
descriptions	המקום הרוס כמעט לגמרי, אבל הנוף יפה.	271277	32.337	35.255	3	2024-04-08T20:55:37Z	149752710	686490	hatul
ion:he		4083	1146	8238					
historical	ruins	271277	32.337	35.255	3	2024-04-08T20:55:37Z	149752710	686490	hatul
		4083	1146	8238					
image	https://upload.wikimedia.org/wikipedia/commons/f/f0/TH שיית M_	271277	32.337	35.255	3	2024-04-08T20:55:37Z	149752710	686490	hatul
		4083	1146	8238					

.חורייש									
jpeg									
name	מצודת שייח שעלה	118043 83269	32.267 1139	35.210 6361	1	2024- 04- 09T08: 53:59Z	149765 653	686490	hatul
name:he	מצודת שייח שעלה	118043 83269	32.267 1139	35.210 6361	1	2024- 04- 09T08: 53:59Z	149765 653	686490	hatul
wikipedia	שייח' he שעלה	118043 83269	32.267 1139	35.210 6361	1	2024- 04- 09T08: 53:59Z	149765 653	686490	hatul
wikipedia:he	שייח' שעלה	118043 83269	32.267 1139	35.210 6361	1	2024- 04- 09T08: 53:59Z	149765 653	686490	hatul
description	מוסתר מתחת לעצים	120599 96569	31.484 4444	35.004 7528	1	2024- 07- 17T20: 03:46Z	154073 763	686490	hatul
description:he	מוסתר מתחת לעצים	120599 96569	31.484 4444	35.004 7528	1	2024- 07- 17T20: 03:46Z	154073 763	686490	hatul
historical	archaeo logical _site	120599 96569	31.484 4444	35.004 7528	1	2024- 07- 17T20: 03:46Z	154073 763	686490	hatul
image	https:// upload. wikime dia.org/ wikipe dia/co mmons /8/85/I גת_HM	120599 96569	31.484 4444	35.004 7528	1	2024- 07- 17T20: 03:46Z	154073 763	686490	hatul

_29.jpe									
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name	גת	120599	31.484	35.004	1	2024-07-17T20:03:46Z	154073	686490	hatul
		96569	4444	7528			763		
2024-									
name:he	גת	120599	31.484	35.004	1	2024-07-17T20:03:46Z	154073	686490	hatul
e		96569	4444	7528			763		
שירידי									
כנסייה									
ביזנטית									
עם									
עמודים									
ופסיפסים									
description	. רצפת	123201	31.396	34.931	3	2024-11-10T11:10:06Z	158962	686490	hatul
ion	פסיפס	90497	4868	5665			991		
	יפה								
	שהיתה								
	במקום								
	הועברה								
	למוזאון								
	השומרוני								
	.הטוב								
שירידי									
כנסייה									
ביזנטית									
עם									
עמודים									
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description:he	. רצפת	123201	31.396	34.931	3	2024-11-10T11:10:06Z	158962	686490	hatul
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	יפה								
	שהיתה								
	במקום								
	הועברה								
	למוזאון								
	השומרוני								
	.הטוב								

historic	ruins	123201 90497	31.396 4868	34.931 5665	3	2024- 11- 10T11: 10:06Z	158962 991	686490	hatul
image	https://upload.wikimedia.org/wikipedia/commons/4/4a/%D7%9B%D7%A0%D7%A1%D7%99%D7%99%D7%AA_%D7%A2%D7%A0%D7%91_%D7%90%D7%9C_%D7%9B%D7%91%D7%99%D7%A8.jpg	123201 90497	31.396 4868	34.931 5665	3	2024- 11- 10T11: 10:06Z	158962 991	686490	hatul
name	כנסיית ענב אל כביר	123201 90497	31.396 4868	34.931 5665	3	2024- 11- 10T11: 10:06Z	158962 991	686490	hatul
name:he	כנסיית ענב אל כביר	123201 90497	31.396 4868	34.931 5665	3	2024- 11- 10T11: 10:06Z	158962 991	686490	hatul
description	גת גדולה עם משטח דריכה שכולל שרידי פסיפס	123203 64502	31.396 9099	34.931 2088	1	2024- 11- 07T11: 20:57Z	158851 574	686490	hatul
description:he	גת גדולה עם משטח דריכה שכולל שרידי פסיפס	123203 64502	31.396 9099	34.931 2088	1	2024- 11- 07T11: 20:57Z	158851 574	686490	hatul
historic	archaeo logical _site	123203 64502	31.396 9099	34.931 2088	1	2024- 11- 574	158851	686490	hatul

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name	nλ	123203	31.396	34.931	1	11-	158851	686490	hatul	
		64502	9099	2088		07T11:	574			
						20:57Z				
						2024-				
name:h e	nλ	123203	31.396	34.931	1	11-	158851	686490	hatul	
		64502	9099	2088		07T11:	574			
						20:57Z				

Appendix B
Amenities Type and Count

Table 13
Palestinian and Israeli Settlers Amenities type and count

Palestinian Amenities	count	Settler Amenities	count
bakery	317	bakery	9
bank	254	bank	13
bar	41	bar	1
beverages	29	beverages	1
bicycle_rental	8	cafe	16
cafe	370	camp_site	1
camp_site	40	car_rental	1
car_rental	75	clinic	34
caravan_site	51	fast_food	12
cinema	8	garden_centre	1
clinic	206	hospital	7
fast_food	182	hostel	1
garden_centre	10	hotel	15
gift_shop	124	mall	4
hospital	233	museum	13
hostel	110	observation_tower	2
hotel	174	park	90
laundry	59	picnic_site	10
mall	33	playground	17
motel	11	restaurant	23
museum	51	stadium	1
newsagent	1	supermarket	51
nightclub	14	tourist_info	8
observation_tower	11	viewpoint	99
park	2972	zoo	2
picnic_site	80		
playground	1107		

restaurant	871		
stationery	2		
stadium	44		
supermarket	3411		
theme_park	20		
toilet	90		
tourist_info	60		
viewpoint	281		
zoo	4		
sum	1135	sum	432
	4		

Appendix C

Questionnaire

السلام عليكم

أنا طالبة ماجستير أعمل على بحث بعنوان:

رسم الخرائط في مناطق الصراع: تحليل توثيق المواقع التاريخية على OpenStreetMap بين

الفلسطينيين والمستوطنين الإسرائيليين في الضفة الغربية

أدعوكم للمشاركة في هذا الاستبيان البسيط.

- لا يشترط أن تكون لديكم معرفة مسبقة ب**OpenStreetMap**
- المشاركة لا تتطلب أي خبرة تقنية أو تخصص معين، بل تعكس آرائكم وتجاربكم.

استبانة حول الوعي بمنصة خرائط الشارع المفتوح - OpenStreetMap

القسم الاول: معلومات شخصية

1. الجنس :

○ ذكر

○ أنثى

2. العمر:

.....

3. مكان الإقامة:

○ أريحا

○ الخليل

○ القدس

○ بيت لحم

○ جنين

○ رام الله والبييرة

○ سلفيت

○ طوباس

○ طولكرم

○ قلقيلية

○ نابلس

○ غزة

4. المستوى التعليمي

○ توجيهي

○ دبلوم

○ بكالوريوس

○ ماجستير

○ دكتوراة

○ أخرى:.....

5. التخصص جامعي

.....

6. العمل (اذا كنت تعمل)

.....

القسم الثاني: الوعي OpenStreetMap؟

7. هل سمعت عن منصة (OSM) (OpenStreetMap)

○ نعم

○ لا

8. إذا كانت إجابتك "نعم"، ما هو مصدر معرفتك بالمنصة؟

○ الإنترنت/وسائل التواصل الاجتماعي

○ الأصدقاء/العائلة

○ الدورات التعليمية

○ مصادر أخرى:.....

9. هل تعرف أن OpenStreetMap يمكن استخدامه لتوثيق الخرائط؟

○ نعم

○ لا

القسم الثالث: استخدام OpenStreetMap في الحياة اليومية

10. هل تستخدم OpenStreetMap في حياتك اليومية؟

○ نعم

لا

11. إذا كانت إجابتك "نعم"، في أي من الحالات التالية تستخدمه؟

التنقل داخل المدن

البحث عن المواقع الأثرية

التخطيط للرحلات

أعراض أخرى:.....

12. هل ترى أن OpenStreetMap يوفر معلومات دقيقة ومحدثة؟

نعم

لا

لا أعرف

القسم الرابع: توثيق المناطق الأثرية

13. هل سبق لك المساهمة في توثيق موقع أثري على OpenStreetMap؟

نعم

لا

14. إذا كانت إجابتك "لا"، ما هو السبب الرئيسي لعدم مساهمتك؟

لا أعرف كيفية التوثيق

لا أملك الوقت

لا أرى فائدة من ذلك

أخرى:.....

15. هل تعتقد أن المناطق الأثرية في الضفة الغربية موثقة بشكل جيد على OpenStreetMap؟

نعم

لا

لا أعرف

القسم الخامس: الفوائد والاقتراحات

16. هل تعتقد أن OpenStreetMap يمكن أن يُستخدم كأداة تعليمية لتوعية الناس بالمناطق الأثرية؟

○ نعم

○ لا

○ لا أعرف

17. ما هو تقييمك لأهمية توثيق المناطق الأثرية الفلسطينية على OpenStreetMap؟

○ مهم جدًا مهم

○ غير مهم

18. هل ترغب في تعلم كيفية المساهمة في OpenStreetMap ؟

○ نعم

○ لا

○ ربما

19. هل لديك اقتراحات لتحسين استخدام OpenStreetMap في توثيق المواقع الأثرية؟

○ نعم

○ لا

20. اذا كانت اجابتك بنعم يرجى كتابة الاقتراح:

.....

Appendix D

Questionnaire results analysis

1. Gender:

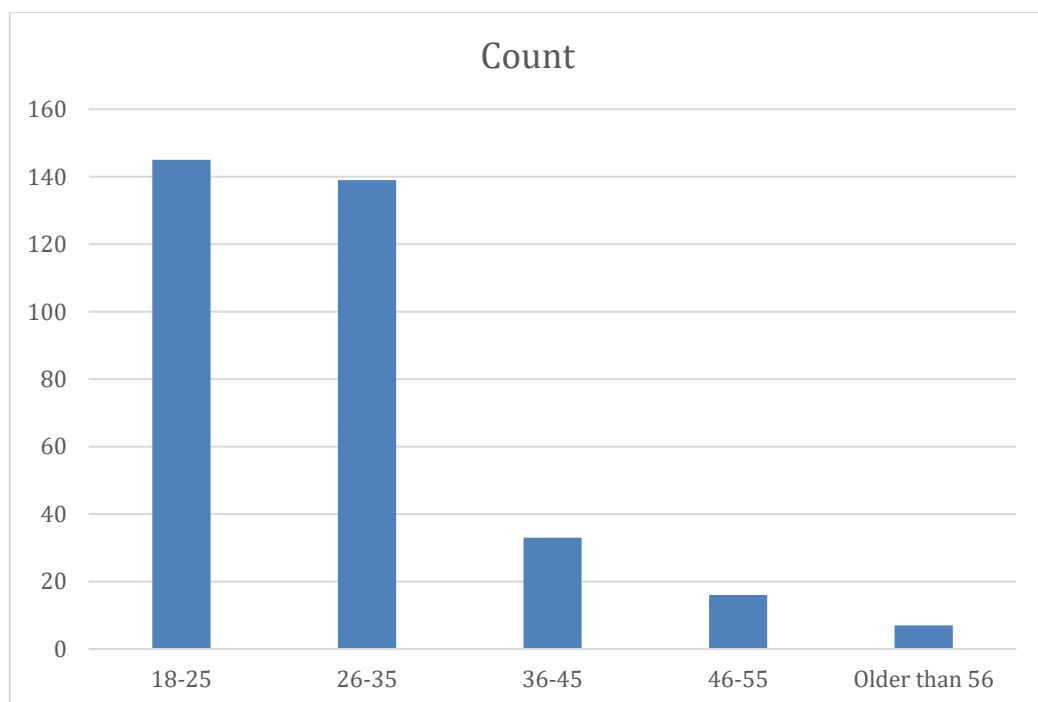
- Male: Count=220, Percent=64.7%
- Female: Count=120, Percent=35.3%

2. Age:

Table 14
Questionnaire participants age categories

Category	Count	Percent %
18-25	145	43
26-35	139	41
36-45	33	10
46-55	16	5
Older than 56	7	2

Figure 11
Questionnaire participants age categories



3. Place of Residence:

Table 15

Questionnaire participants place of residence

Governorate	Count	Percent %
Nablus	42	12.4
Qalqilya	15	4.4
Tubas	8	2.4
Salfit	10	2.9
Tulkarm	154	45.3
Jenin	22	6.5
Jericho	9	2.6
Ramallah and al-Bireh	59	17.4
Bethlehem	7	2.1
Hebron	8	2.4
Jerusalem	6	1.8

4. Educational Level

Table 16

Questionnaire participants' educational level

Educational Level	Count	Percent %
High School	28	8.2
Diploma	15	4.4
Bachelor's Degree	253	74.4
Master's Degree	38	11.2
PhD	6	1.8

Figure 12

Pie charts showing the demographic data of the questionnaire participants

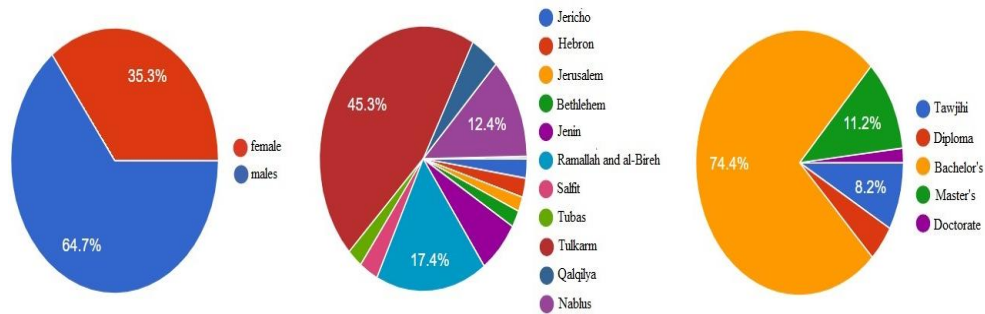


Table 17
Awareness of OpenStreetMap (OSM) by Gender

Know OSM	Female	Male	Grand Total
No	91	167	258
Yes	29	53	82
Grand Total	120	220	340

Table 18
Awareness of OpenStreetMap (OSM) by Age Group

Know OSM	18-25	26-35	36-45	46-55	Older than 56	Grand Total
No	110	104	27	10	7	258
Yes	35	35	6	6	0	82
Grand Total	145	139	33	16	7	340

Table 19
Awareness of OpenStreetMap (OSM) by Governorate

Know OSM	No	Yes	Grand Total
Jericho	9		9
Hebron	8		8
Jerusalem	5	1	6
Bethlehem	6	1	7
Jenin	18	4	22
Ramallah and al-Bireh	42	17	59
Salfit	9	1	10

Tubas	4	4	8
Tulkarm	11	43	
	1		154
Qalqilya	13	2	15
Nablus	33	9	42
	25		
Grand Total	8	82	340

5. Have you heard of the OpenStreetMap (OSM) platform?

- Yes: Count=258, Percent=75.9%
- No: Count=82, Percent=24.1

6. If your answer is "Yes," how did you learn about the platform?

- Internet/social media: Count=53, Percent=57.6%
- Friends/family: Count=18, Percent=19.6%
- Training Programs: Count=2, Percent=2.2%
- Other: Count=19, Percent=20.7%

7. Do you know that OpenStreetMap can be used for mapping documentation?

- Yes: Count=257, Percent=75.6%
- No: Count=83, Percent=24.4%

8. Do you use OpenStreetMap in your daily life?

- Yes: Count=302, Percent=88.8%
- No: Count=38, Percent=11.2%

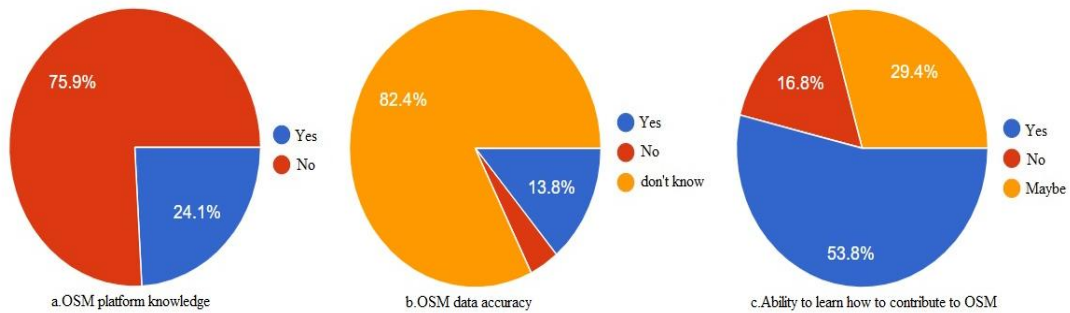
9. If your answer is "Yes," in which of the following cases do you use it?

- Navigation within cities: Count=28, Percent=47.5%
- Searching for specific places: Count=4, Percent=6.8%
- Planning trips: Count=2, Percent=3.4%

- Other: Count=25, Percent=42.4%

Figure 13

Pie charts showing the participants responds about (OSM) data



10. Do you think OpenStreetMap provides accurate and updated information?

- Yes: Count=47, Percent=13.8%
- No: Count=13, Percent=3.8%
- Not sure: Count=280, Percent=82.4%

11. Have you ever contributed to documenting a historical site on OpenStreetMap?

- Yes: Count=20, Percent=5.9%
- No: Count=320, Percent=94.1%

12. If your answer is "No," what is the main reason for not contributing?

- I don't know how to contribute: Count=178, Percent=60.5%
- I don't have time: Count=35, Percent=11.9%
- I don't see the importance of it: Count=14, Percent=4.8%
- Other: Count=67, Percent=22.8%

13. Do you think that historical sites in the West Bank are well-documented on OpenStreetMap?

- Yes: Count=26, Percent=7.6%
- No: Count=99, Percent=29.1%

- Not sure: Count=215, Percent=63.2%

14. Do you think OpenStreetMap can be used as an educational tool to raise awareness about historical sites?

- Yes: Count=157, Percent=46.2%
- No: Count=15, Percent=4.4%
- Not sure: Count=168, Percent=49.4%

15. How would you rate the importance of documenting Palestinian historical sites on OpenStreetMap?

- Very important: Count=217, Percent=63.8%
- Important: Count=93, Percent=27.4%
- Not important: Count=30, Percent=8.8%

16. Would you like to learn how to contribute to OpenStreetMap?

- Yes: Count=183, Percent=53.8%
- No: Count=57, Percent=16.8%
- Maybe: Count=100, Percent=29.4%



جامعة النجاح الوطنية
كلية الدراسات العليا

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على خرائط الشارع المفتوح بين الفلسطينيين والمستوطنين
الإسرائيليين في الضفة الغربية

إعداد

رهف حمزة حفيظة

إشراف

د. لؤي ابو ريده

د. ايهاب حجازي

قدمت هذه الرسالة استكمالاً لمتطلبات الحصول على درجة الماجستير في الجيوماتيكس، من كلية الدراسات العليا، في جامعة النجاح الوطنية، نابلس - فلسطين.

2025

رسم الخرائط في مناطق الصراع: تحليل توثيق المواقع التاريخية على خرائط الشارع المفتوح بين الفلسطينيين والمستوطنين الإسرائيليين في الضفة الغربية

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الملخص

تاريخ الصراع الإسرائيلي الفلسطيني طويل ويمتد لعقود، حاول خلالها المستوطنون الإسرائيليون السيطرة على أرض فلسطين باستخدام أساليب متنوعة وسرد روايات متباينة. ومع تطور التكنولوجيا وظهور منصات المعلومات الجغرافية التطوعية (VGI) مثل منصة (OpenStreetMap (OSM، لعبت هذه المنصات دورًا مهمًا في توثيق المواقع في المناطق المتنازع عليها جيوسياسيًا مثل الضفة الغربية. تهدف هذه الدراسة إلى تحليل مساهمات كل من المستوطنين الإسرائيليين والفلسطينيين على منصة OpenStreetMap ودراسة دوافع مساهمات كل من الطرفين.

يتبع البحث نهجًا كميًا يجمع بين التحليل المكاني وتحليل البيانات الوصفية لتقييم مدى ودقة تغطية المواقع التاريخية على خرائط الشارع المفتوح، ودراسة مساهمات الفلسطينيين والمستوطنين الإسرائيليين في المنصة. علاوة على ذلك، تم إعداد استبيان لقياس مدى وعي الفلسطينيين بمنصة خرائط الشارع المفتوح، وشمل 340 مشاركًا من جميع أنحاء الضفة الغربية.

تكشف النتائج عن اختلاف واضح بين المواقع التاريخية الموثقة على منصة OSM (653) وتلك الموجودة في السجلات الرسمية والأكاديمية (1928). ويعود ذلك إلى الطبيعة التطوعية للمنصة، التي تتيح للسكان المحليين توثيق المواقع من وجهات نظرهم الخاصة، دون قيود قانونية رسمية. علاوة على ذلك، فإن

63.25% من المواقع التاريخية الواقعة في المنطقة "ج" الخاضعة للسيطرة الإسرائيلية، و397 موقعًا (61% تقريبًا) تقع ضمن مناطق النفوذ الإسرائيلي، مقارنةً بـ 266 موقعًا (41% تقريبًا) في المناطق الفلسطينية. وكشف تحليل البيانات الوصفية أن المستخدمين الإسرائيليين وثّقوا 29 موقعًا، والفلسطينيين وثّقوا 27 موقعًا من عينة من 115 مستخدمًا، إلا أن المساهمات الإسرائيلية كانت عمومًا أكثر تفصيلًا ودقة، بينما كانت العديد من المساهمات الفلسطينية مصنفة بشكل خاطئ أو محدودة.

الكلمات المفتاحية: المعلومات الجغرافية التطوعية (VGI)، خريطة الشارع المفتوحة (OSM)، المواقع التاريخية، التحليل المكاني، تحليل البيانات الوصفية، رسم خرائط الصراع، الصراع الإسرائيلي الفلسطيني