

North Riyadh Geo-Park in Thadiq Governorate

Management Plan, 2024-2028



**North Riyadh Geo-Park
in Thadiq Governorate
The Kingdom of Saudi Arabia
Management Plan
2024-2028**

Explore the Geo-heritage values of Thadiq!

2024

Food and Agriculture Organization of the United Nations

–Riyadh, 2024

Required citation:

Kamerino S. et al. 2024. North Riyadh Geo-Park in Thadiq Governorate. Management Plan 2024-2028. Riyadh, Saudi Arabia, FAO-KSA.

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Executive Summary

This management plan for **North Riyadh Geo-Park** in Thadiq governorate has been developed in accordance with acceptable standards of planning in Protected and Conserved areas. Development of this plan is a clear indication of NCVC's commitment to safeguard, maintain and restore integrity of Saudi Arabia National, Terrestrial and Geological Parks. The plan takes a broad multi-sectoral view of the exceptional resource values within the North Riyadh Geo-Park.

The planning process followed a highly participatory approach incorporating ideas from a broad spectrum of stakeholders with interest on the conservation and sustainable management of Wuthaylan National Park. They included representation from the local communities, local government, NCVC senior executives, the General Department of National Parks, Thadiq National Park management team, NCVC senior ecotourism expert and FAO-KSA experts led by Steve Kamerino who supported the technical aspects of plan development.

Contributions and feedback were achieved through participation in the core planning team meetings, information gathering forums, stakeholder meetings, plan drafting meetings, plan validation and approval meetings. The key steps followed in its development are summarized in figure 1.

This Plan has been primarily designed to be a practical management tool that will guide integrated and coordinated management of its landscape. It achieves this by providing strategic guidance on management directions to be implemented over the five-year period (2024-2028). The recommended management interventions range from

- 1) strengthening of geo-park governance and management structures and systems,
- 2) enhanced human resource capacity development and competency,
- 3) collaborative partnerships with key partners and community engagement to improve geo-park management,
- 4) enhanced geo-education to increase awareness on the most important geological values in Thadiq,
- 5) protection, rehabilitation, and conservation of key habitats to reduce biodiversity loss, improve species recovery and ecosystem functioning and
- 6) promoting geo-tourism investments and experiences for community well-being.

Each of thematic management programme was based on well thought out management actions, guiding principles, and specific management activities upon which indicators of achievement have been based. Implementation of these management initiatives will provide effective ways of addressing key threats and management issues of concern and sustainable management of the exceptional resources within its landscape.

The primary ownership and responsibility for the implementation of this management plan rests with the National Centre for Vegetation Cover and Combating Desertification (NCVC), the Director of Saudi Geo-Parks unit, the Department of National Parks, and Thadiq National Park management team.

Chapter 1: Introduction

1.1 Background Information

The National Centre for Vegetation Cover Development & Combating Desertification (NCVC) is charged the responsibility of safeguarding and sustainably managing the national, terrestrial, and geological parks in accordance with applicable best practices and systematic procedures.

These are sites with unique natural and geological characteristics that have been set aside for conservation of biodiversity and promoting investments in nature-based tourism aspects such as recreation, ecotourism, and geo-tourism activities.

According to UNESCO, a Geo-Park can be defined as "*...single, unified geographical areas where sites and landscapes of international geological significance are managed with a holistic concept of protection, education and sustainable development*". It must demonstrate that the linkage between geological heritage values and the area's natural, tangible, and intangible cultural heritage in the area.

A UNESCO Global Geopark uses its geological heritage, natural and cultural heritage to raise awareness and understanding of the history of earth's resources, their sustainable uses, and their related key threats such as climate change or natural hazard related risks.

The centre (NCVC) has commenced efforts to establish and enhance capacity of geological parks in the kingdom. This initiative is being spearheaded under the leadership of the Director Saudi Arabia Geo-Park unit of NCVC. As a result, Thadiq governorate was identified for consideration as one of the priority locations establishing geo-park.

In 2023 an area measuring approximately 3221km² was identified, surveyed, and nominated for consideration in inclusion to the UNESCO GLOBAL GEOPARKS through application dossier dubbed "***Aspiring KSA North Riyadh Thadiq aUGGP***". The Geo-Park needs to be effectively conserved, well governed, and sustainably managed based on applicable international best practices. Planning is one of the effective approaches to coherent, integrated, and coordinated management of Protected and Conserved areas.

Management plans are some of the universally acceptable instruments for effective planning and efficient management of National Parks. They are succinct documents that are a product of planning process that set out the management strategies, objectives, and actions to be implement in a coherent and coordinated manner over a given period.

Therefore, development of this plan is a clear indication of the NCVC's commitment to conform with international standards on effective management of national, terrestrial, and geological parks in the Kingdom. It will ensure that the valuable and exceptional resource values in the North Riyadh Geo-Park are effectively conserved, sustainably utilized, and efficiently managed to guarantee long term benefits that they provide for human well-being.

1.2: Methodology and Approach of this Plan development

The development of this management plan adopted internationally acceptable guidelines that clearly define standard approaches for designing management plans in Protected and Conserved Area.

The planning process was highly participatory and involved a broad spectrum of stakeholders with interest in North Riyadh Geo-Park.

This was achieved through a multi-layered approach that involved variety of mechanisms designed to ensure that all key stakeholders contribute meaningfully to the plan's development. The stakeholder involved included representatives from NCVK senior management, Thadiq National Park managers, the local community representatives and FAO-KSA consultants who provided technical advisory roles based on their expertise. Figure 1 provide events on some of the stakeholder who either participated, consulted, and heavily involved in the development of this plan.

The mechanisms used to ensure meaningful stakeholder participation in the planning process included:

- ❖ Core Planning Team to drive the process of drafting the plan,
- ❖ Information gathering forums through desktop reviews, analysis of key documents, and field visits to understand the contextual issues,
- ❖ Engagement forums with the local communities within and adjacent to North Riyadh Geo-Park in Thadiq.
- ❖ Series of other key stakeholder group meetings for consultations and feedback,
- ❖ Plan validation, endorsement, and approval meetings.

Figure 1: Geo-Park Management Plan Development Process.



Table 1: Boundary coordinate points for the North Riyadh Geo-Park.

No.	Latitude	Longitude
1	25°16'1.82"N	45°19'38.56"E
2	25°9'58.69"N	45°27'45.72"E
3	25°0'17.34"N	45°38'53.46"E
4	25°2'58.64"N	45°53'46.95"E
5	25°9'39.50"N	46°3'54.35"E
6	25°19'19.91"N	46°11'41.33"E
7	25°31'44.46"N	46°15'26.57"E
8	25°31'22.94"N	46°4'13.35"E
9	25°32'10.12"N	45°54'41.46"E
10	25°33'11.42"N	45°45'24.70"E
11	25°24'7.90"N	45°49'29.59"E
12	25°24'17.77"N	45°35'45.95"E
13.	25°25'45.84"N	45°28'18.85"E

Source: NCV, 2023

2.2: Accessibility

The area can be accessed through the main highway road 65 linking Thadiq governorate and Riyadh, the capital city of Saudi Arabia. Besides the highway road, there are a series of paved secondary roads such as the King Fahad highway road 505 and small feeder road networks that serve the settlement areas in small towns and villages within Geo-Park area as shown in figure 3 below.

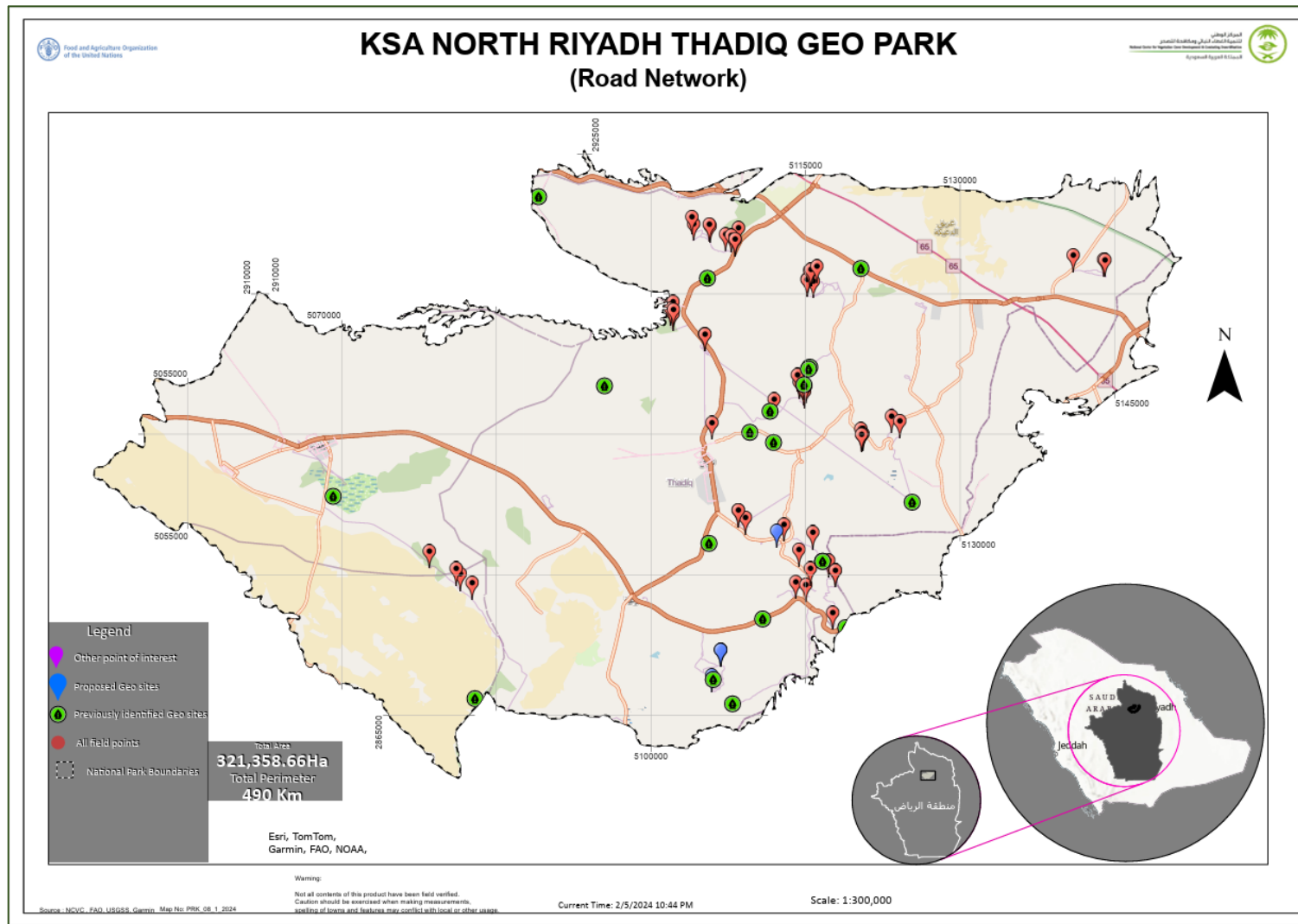
The good condition of road network provides excellent opportunity that will drive tourism in the geo-park and adjacent areas. It is however important to note that, the routes linking most of the sites within the geo-park landscape are rugged and might hamper comfort of visitors. Majority of the tracks are single lane and unsealed roads which will be suitable for 4WD, or high clearance vehicles preferred by most adventure tourists. These roads should be upgraded to all weather roads using polymer surfacing.

Picture 1: Some of the roads in Thadiq Geopark Area



Photo credit: Tony Charters. 2024.

Figure 3: Road Network in North Riyadh Geo-Park



Source: NCVC, 2023.

2.3: Management Authority

The **National Centre for Vegetation Cover development and Combating desertification** (NCVC) was established vide council of ministers' decision number 417 dated **19/07/1440H** (March 2019). The centre is charged with the mandate of overseeing the development and sustainable management of **national park**, conservation and preservation of vegetation cover and plant genetic resources in forest and rangelands, as well as combating desertification in the Kingdom.

To ensure smooth governance and implementation of the administrative operations, the centre (NCVC) is supported by several administrative units highlighted in figure 4. Its organisation structure sheds light the lines of authority and vertical accountability or responsibility. Each of the offices in the structure have clearly defined functions, powers and job descriptions and reporting channels. Its centralized governance structure which is operationalized through several departmental units namely the;

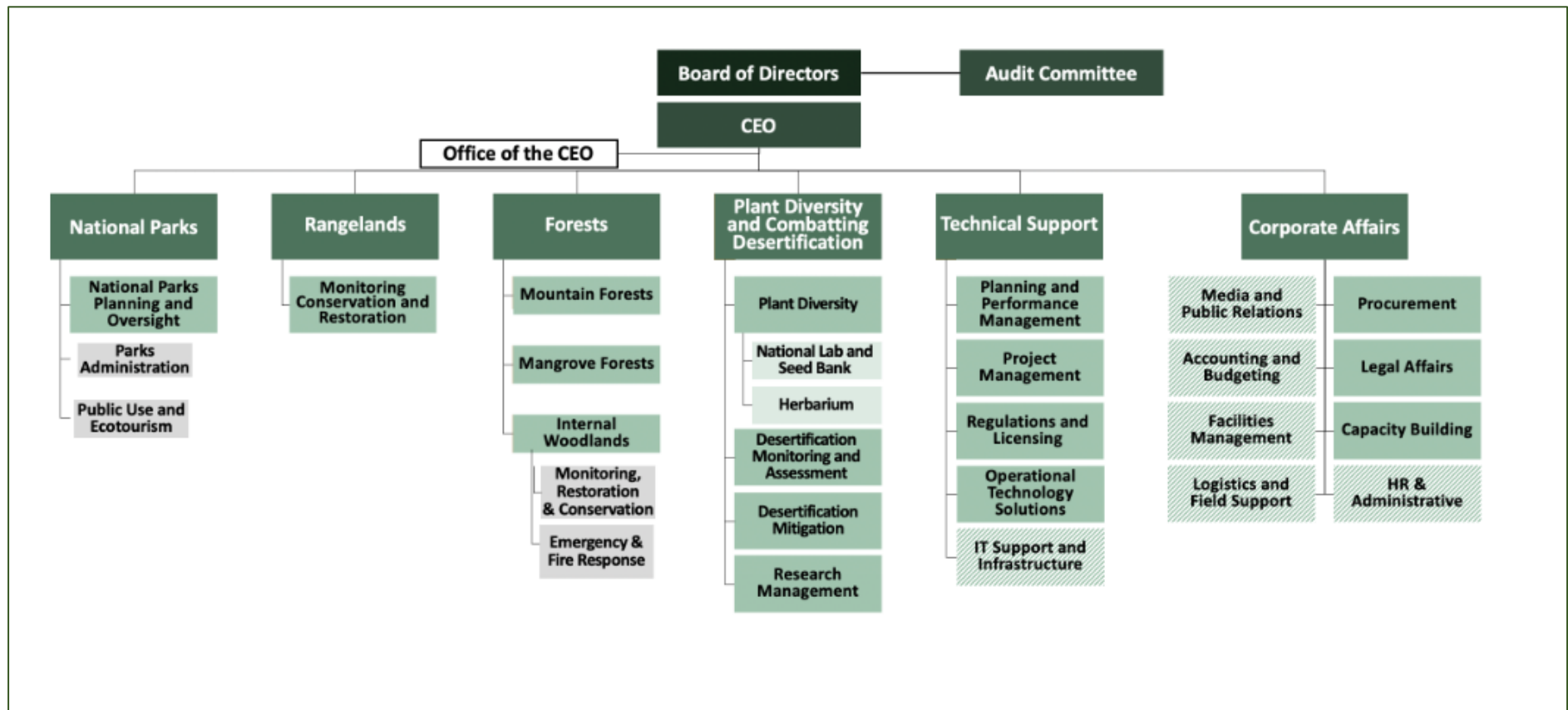
- ❖ Department of National Parks,
- ❖ General Department of forestry and afforestation,
- ❖ Department of plant diversity and combating Desertification,
- ❖ Department of Financial Resources and Investments,
- ❖ Technical Support department,
- ❖ Department of Corporate affairs
- ❖ Department of Security and Protection

Since NCVC has the mandates and roles in developing, promoting investments, conserving, and managing the national parks areas, the **National Parks Department** has the responsibility of ensuring that the national parks in the kingdom are well developed and sustainably managed for environmental, economic, and social benefits.

In 2023, the centre (NCVC) commenced efforts establish Geo-Parks in the Kingdom including their management and administration. This will be very crucial in streamlining the preservation of geological resources, enhancing conservation, and promoting sustainable use and management of natural and cultural resources for the benefits of community well-being.

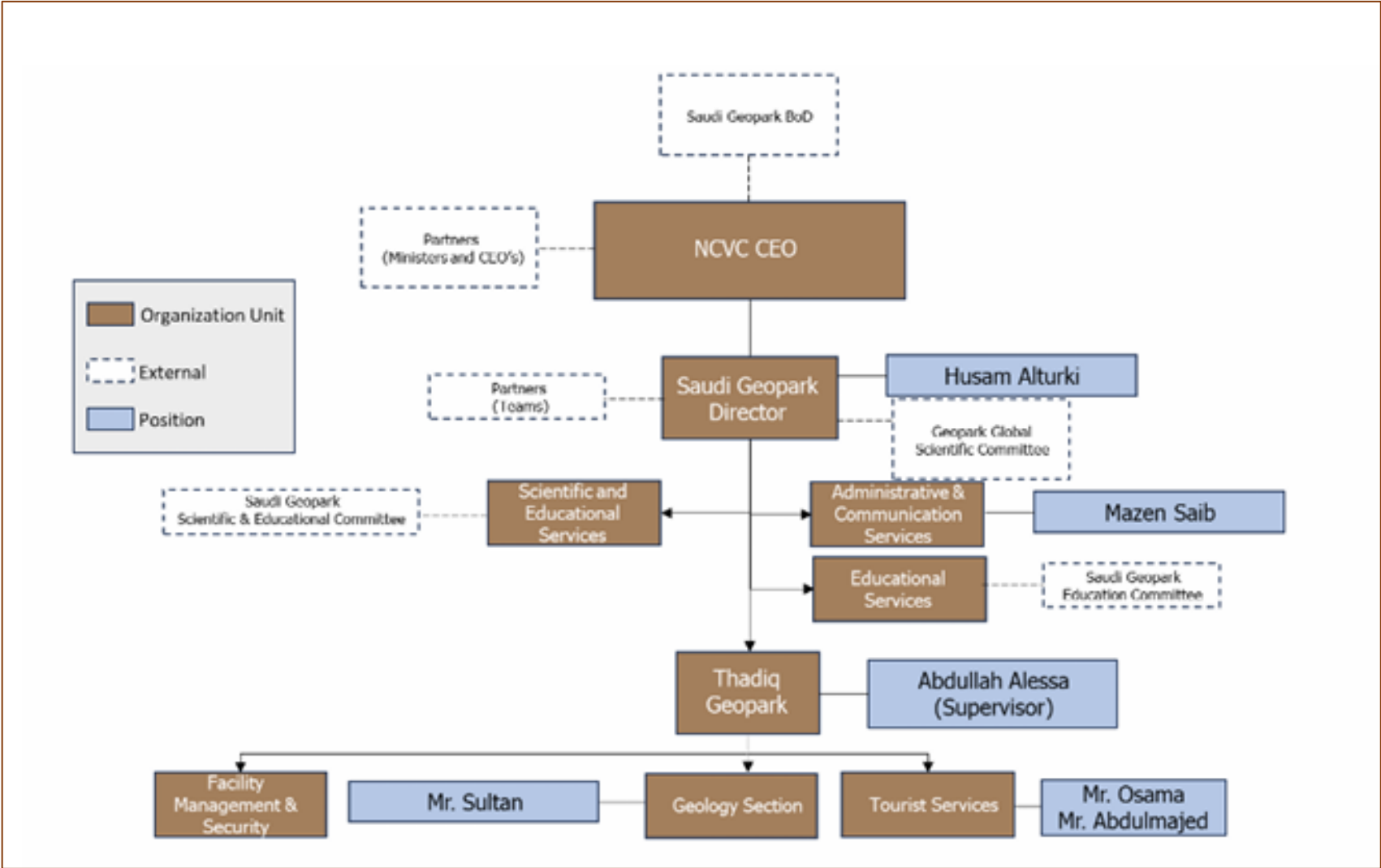
Under this initiative, an area in Thadiq governorate that measures approximately 3221km², was identified for consideration in as a Geo-Park. The North Riyadh geo-park in Thadiq is one of the areas under NCVC. The National Parks department unit is responsible for administrative and management functions. The organization structure and management operations will be spearheaded by a Geo- Park's unit supported by several sections as shown in figure 5 upon validation and approval by NCVC board of directors.

Figure 4: Organization Structure of National Centre for Vegetation Cover Development and Combating Desertification (NCVC)



Source: <https://ncvc.gov.sa/> accessed on 28th March 2024

Figure 5: Proposed Saudi Arabia Geo-Park Organisation Structure







Source: National Centre for Vegetation Cover and Combating Desertification, 2024

2.4: Key Stakeholders within interest to Thadiq Geo-Park

Stakeholders play important and complementary roles in supporting different programs and activities in Geo-Parks. During the development of this management plan, stakeholders with potential influence and interest to North Riyadh Geo-Park in Thadiq were identified, mapped out and analysed. See annex 1 for the detailed summary of the findings of the stakeholder analysis.

This is a process that enabled better understanding and prioritization of key stakeholders which the Thadiq Geo-Park management can interact with and lobby for support on the park activities. The recommended strategy and level of their engagement can be through informing, consulting, actively involvement, collaborating and empowerment of the key stakeholders. The following matrix summarizes the results of the prioritization process depending on their level of influence and impact.

Table 2: Stakeholder Influence-Interest matrix

 Influence  Low	High Those with high influence but low stake and should be handled with care. They should be kept satisfied and completely informed.	Those with High Influence-High Stake and should be accorded top priority. They are key players and should be actively involved and closely managed.	
	<ol style="list-style-type: none"> 1. Ministry of Municipal and Rural Affairs (MOMRA) 2. Thadiq Governorate (Emarah) 3. Royal Commission for Riyadh City (RCRC) 4. Saudi Commission for Tourism and National Heritage 5. National Centre for Wildlife (NCW) 6. Saudi Geological Survey 	<ol style="list-style-type: none"> 1. Ministry of Environment, Water and Agriculture -Environment Agency 2. National Centre for Vegetation Cover and Combating Desertification (NCVC) 3. The National Parks Department 4. The Saudi Arabia Geo-Parks unit 5. Thadiq National Park Managers and staff 	
	Those with Low influence and low stake but should be monitored since they can regularly or occasionally be contacted and/or collaborate for technical and advisory support.	Those with Low influence but high stake and should be kept engaged, empowered, and influenced actively.	
	<ol style="list-style-type: none"> 1. International Organizations (UNESCO, FAO, IUCN, UNEP, UNDP etc.) 2. Research and academic institutions (e.g., Shaqra university, King Saud University, King Abdulaziz University, King Abudulaziz city for sciences and Technology (KACST) 3. Royal reserve and sanctuaries such as Imam Abdulaziz Bin Mohammed Royal Reserve, King Khalid Royal Reserve). 	<ol style="list-style-type: none"> 1. Tour operators and guides (such as Ghamra tourism company, DARB Saudi Hiking Trails Association) 2. Environmental NGOs in Thadiq Governorate 3. Local community members 4. Landowners within and adjacent Geo-Park boundary 5. Tourists and Park visitors 6. Local business entrepreneurs and hoteliers 7. Local traditional leaders 	
	Low	High Stake	
		Interest	

Source: Authors analysis

2.5: Climate

The climate in Thadiq governorate, where the Geo-Park is located, is predominantly the same as that of the surrounding Najd region. The area generally experiences hot desert climate with temperatures ranging from 23°C to 42°C in summer and from 6°C to 21°C in winter. These extreme weathers are due to fact that the area is located deep inland and deprived of oceanic breezes.

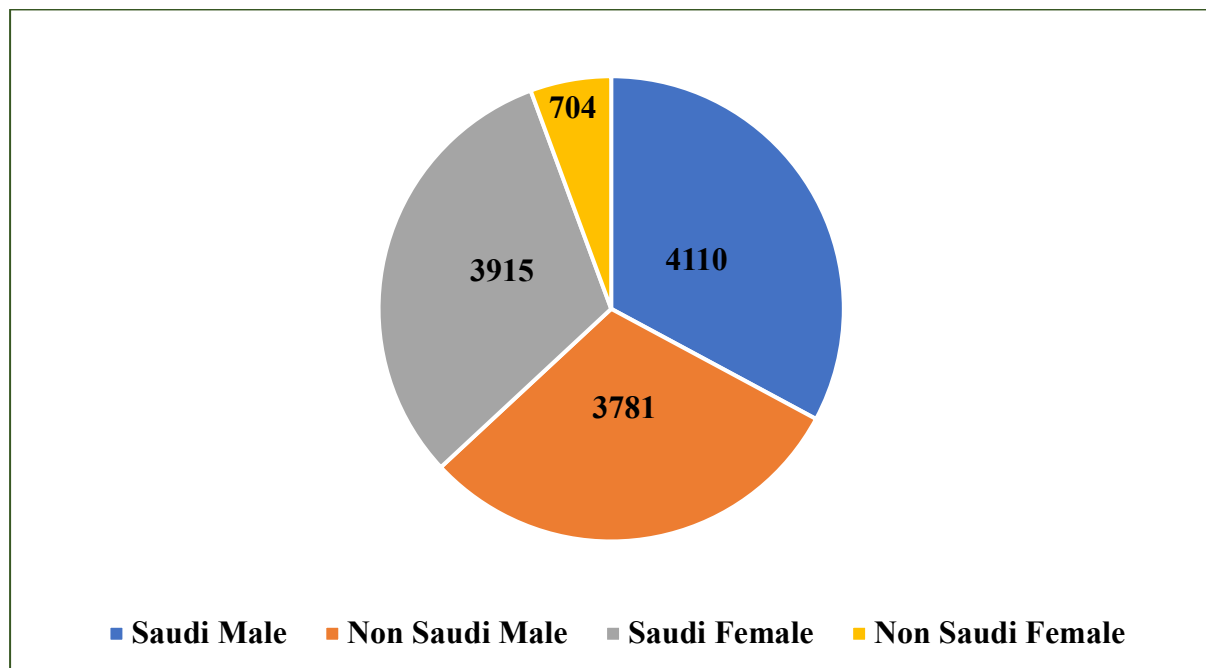
2.5: Population Demographics in Thadiq Governorate

The human population demographics in Thadiq Governorate has decreased over the last decade. According to the results of the general census for the year 2022, Thadiq governorate had an estimated population of 12,510 persons. This was a reduction from a population of 17,046 estimated in the year 2010. This represents a **-2.5%** annual population change (decrease) over the years compared to the national growth rate of **+2.3%** (increase). This data was derived from the KSA General Authority of Statistics for the year 2010 and 2022 censuses.

The population decrease can be attributed to migration motivated by the desire of the people to move more cities such as Riyadh, Al Hassa, Jubail, Kuwait and other major cities in search for better education and improved living conditions. The remaining permanent residents are concentrated in town, villages and farms distributed across Thadiq Governorate area of approximately 3,870km².

These residents form a well-integrated community of locals and expatriates (see figure 6 below) characterized by love and kindness influenced from the Islamic values and culture. There is need for mechanisms to institute sustainable management of natural resources both for conservation and economic development in the area.

Figure 6: Population statistics in Thadiq Governorate

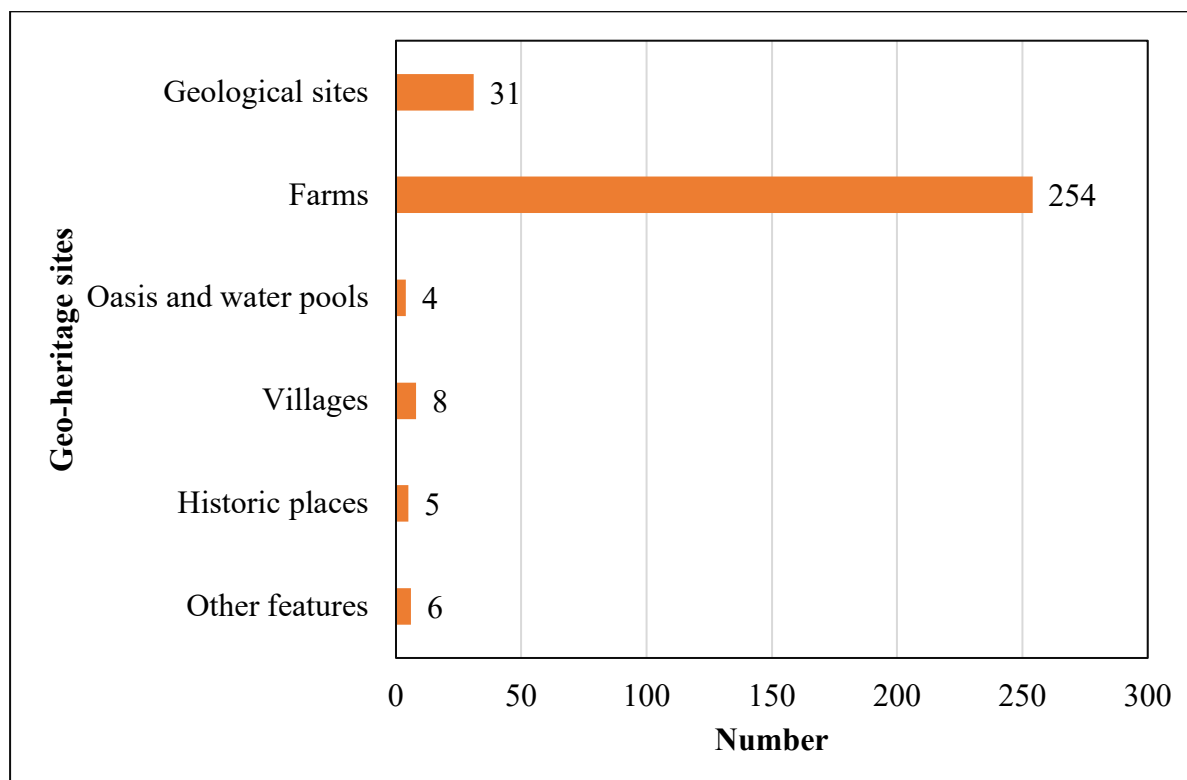


Source: Data extracted from GASTAT 2022 Population Census Database (web).

Chapter 3: Exceptional Resource Values (ERVs)

This section introduces landscape features within the North Riyadh Geo-Park Thadiq Geo-Park. These are features that define the socio-ecological characteristics of the geo-park and this management plan aims to maintain or improve their preservation. Based on research studies spearheaded by NCV in 2023, several geo-heritage sites were identified, assessed, and mapped (see figure 7).

Figure 7: Types and numbers of geo-heritage sites identified in North Riyadh Geo-Park



Source: National Centre for Vegetation Cover and Combating Desertification, 2023.

For the purposes of management and planning, they have been prioritized and categorised into geological, biodiversity, scenic and socio-cultural heritage values. They are briefly discussed in the sections below.

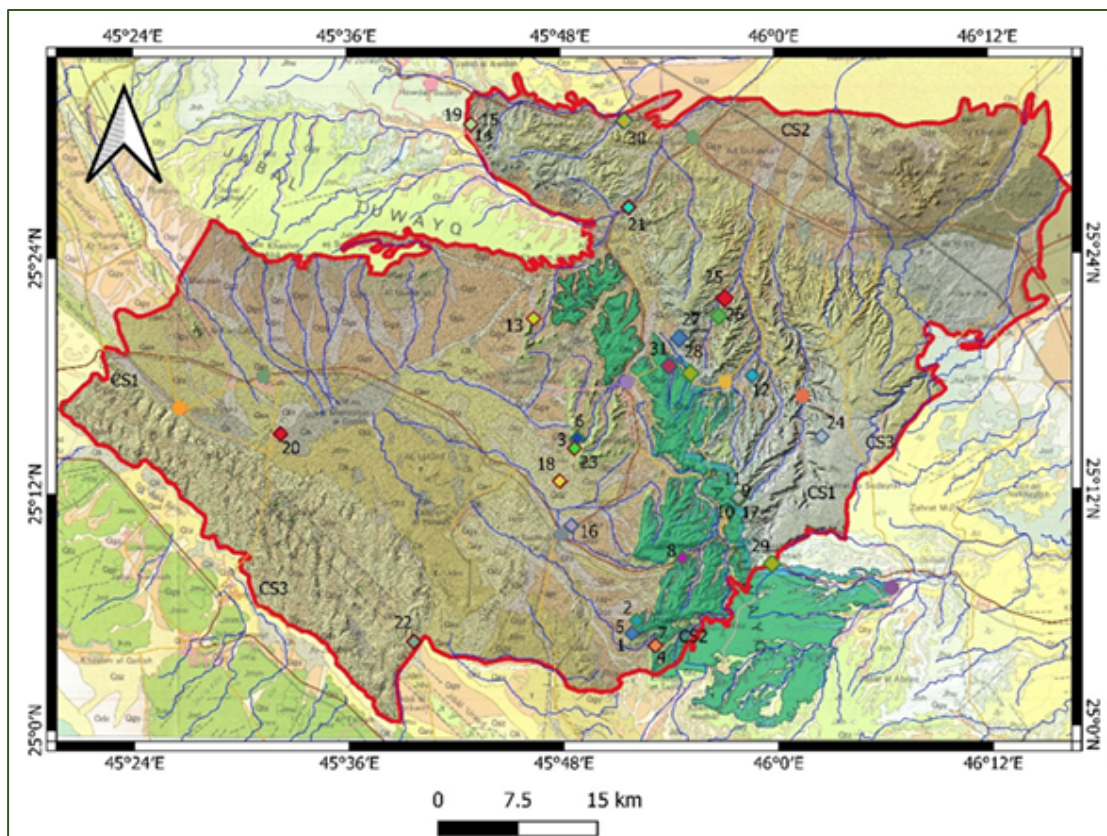
3.1: Geological Values

The landscape where Thadiq Geo-Park lies is on a Neoproterozoic basement (the **Arabian shield**) formed during the Mesozoic age. The Geological values in the area are mainly comprised of geological features (such as fossils, rocks, minerals etc.), geomorphological and paleontological assets. Description of detailed geological formation and structure of the area can be accessed through the report prepared by NCV in 2023. However, in summary, the area has rich geological assets that can be grouped in the following areas;

- ❖ The Jurassic-cretaceous hard rock layers dominated by fossilized limestones, dolostones, and sandstones. These sedimentary layers of hard rock structures can be about 5,500m thick in some areas and decreases eastwards and towards the west.

- ❖ Petroleum geology heritage, groundwater and other valuable ground resources that linked to the symbiotic life of early settlers within a rapidly changing quaternary intracontinental landscape. This makes the area economically important to the local and national population.
- ❖ The globally significant geomorphological assets of Table Mountain land that contains dendritic but smooth surfaced eastern sides, rugged escarpment bounded central axis and the gentle sloping basins of aeolian sediments on the western and northern side (NCVC, 2023).
- ❖ The ground surface covered by different soil profiles made up of minerals and organic components that are fragmented and loose due to erosive conditions of the area. The soil structure within the vicinity depends on the ground moisture content and weather erosion agents. They range from shallow, semi levelled to deep silt-gravel soils, shallow to deep clay or clay-gravel soils, salt marsh swamps areas with saline, deep clay-silt soils and sand dunes that can be over 2 metres high.

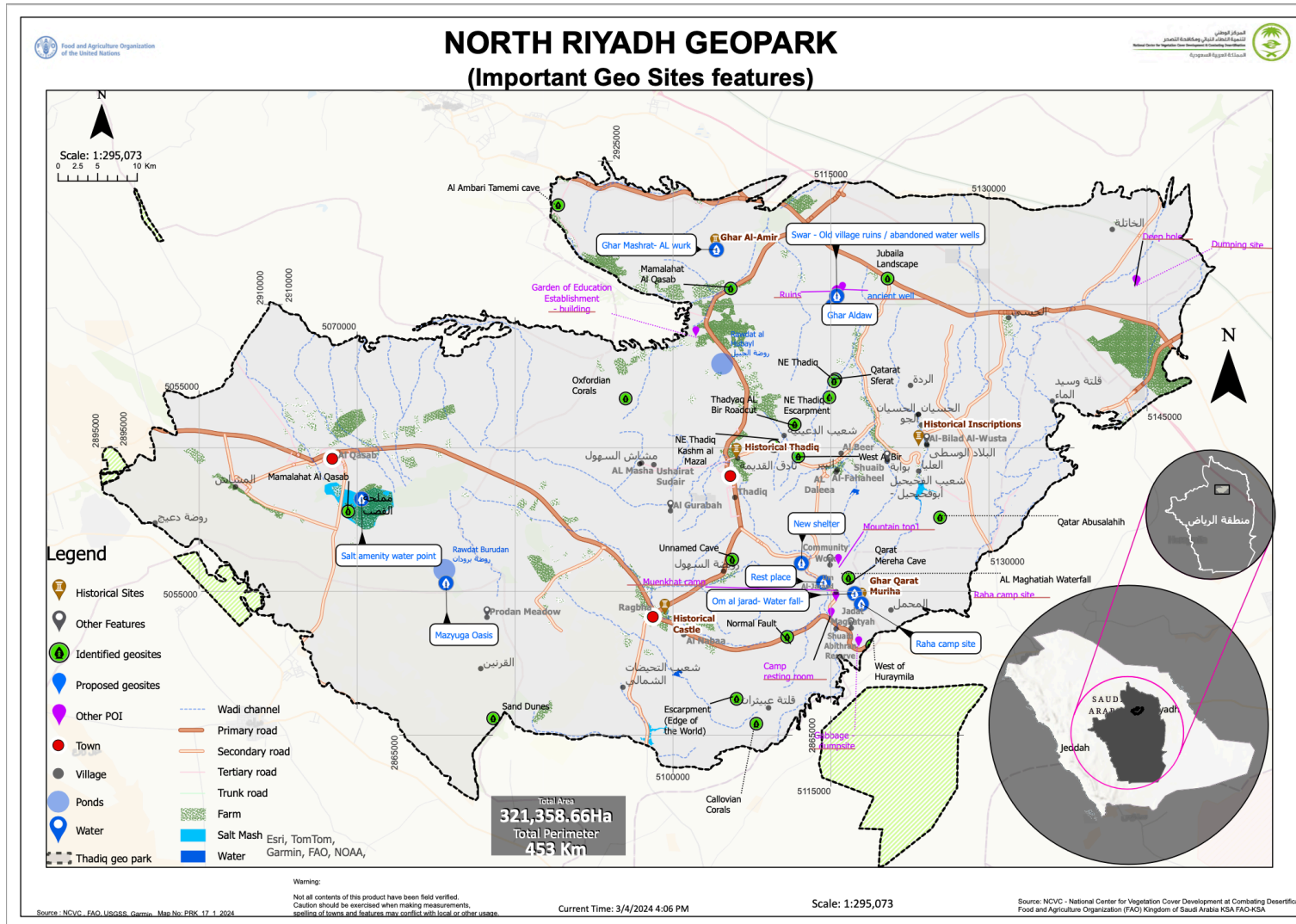
Figure 8: North Riyadh Geo-Park geology map.



Source: NCVC, 2023.

The following section briefly describes some of the identified sites of geological value. The locations of most of these geo-sites are shown in figure 7 below.

Figure 9: Identified Geo-sites in North Riyadh Geo-Park



Data source: NCVC, 2023

3.1.1: Mamlahat Al Qasab Salt Flats

The salt pans of Al Qasab are located approximately 170km north-west of Riyadh in Shaqra governorate. The expansive salt areas locally known as *“sabkha Al Qasab”* that forms when underground water approached the surface. The area is covered by saline crusts, clay, silt, and sand forming a fascinating landscape of white salt dunes in the middle of the desert. It is the largest salt flats in Najd region, bordered to the west by massive sand dunes of Ad Dahna desert.

Sabkha Al Qasab is also one of the largest primary sources of salt in the Arabian Peninsula, producing approximately 200,000 tons of salt annually. The saline water courses from Hamada valley deposit salt, silt, and sand. The salt in sabkhas is extracted through the action of the sun and wind. The water settled on the shallow ponds evaporates exposing rock deposits of salt minerals on the ground that are later cleaned to obtain smooth salt particles.

Historically, the city of Qasab was famous since pre-Islamic era for high-quality salt production locally known as *“Melh Al Qasab”* and were previously transported across the Arabian Peninsula by camel caravans. The city has immense potential for geo-tourism as a popular destination for travelers who want to experience the natural methods of salt extraction. Besides the Al Qasab salt flats, other popular sites of tourism interest in the area include Al Obaidi market, Al Marqab tower, Al Oqdah wall, Al Ekreshiya lake and Al zahem site. The city of Al Qasab is also known for its poets from talented individuals within the local community.

However, despite the historical and economic importance, salt production in the area is facing several challenges ranging from pollution of underground water from garbage wastes and severe drought impacts that is drying up the salt producing areas. There is need for enhancement of several environmental protection and conservation measures within the area and adjacent surroundings.

Picture 2: Salt ponds and dunes of harvested salt



Photo Credits: Steve Kamerino, 2024.

Picture 3: Packaging of Salt into several packets on site



Photo Credits: Steve Kamerino, 2024.

3.1.2: Cave Features

The North Riyadh Geo-Park in Thadiq governorate, has some of the most stunning and awe-inspiring shallow cave systems that are formed by natural weathering processes from water and wind. There are so many caves within the area that need to be surveyed, mapped, preserved, and developed. Some of the already identified natural caves include:

- ❖ Ghar Bushdad
- ❖ Ghar Madhaf in ubeitheran
- ❖ Ghar Abud rijja overlooking wadi omud rub
- ❖ Ghar Raha and Ghar Al Arus in murahab area
- ❖ Ghar Al mashrat / Al Wurk
- ❖ Ghar Badha in Uraidh mountain
- ❖ Ghar Al Salu (a.k.a Ghar Ibn Khunazain) at Jabal Uraidh in Om Al Shoqoq area
- ❖ Ghar Bathadhyan in Swar area
- ❖ Ghar Al Amabari Tamim in wrat area near oudah city
- ❖ Ghar butheilaimah at Shuaib khareer
- ❖ Ghar Abu dirajah along wadi Umud ad roub
- ❖ Ghar qarat Muriha in the area that has scenic viewpoints.

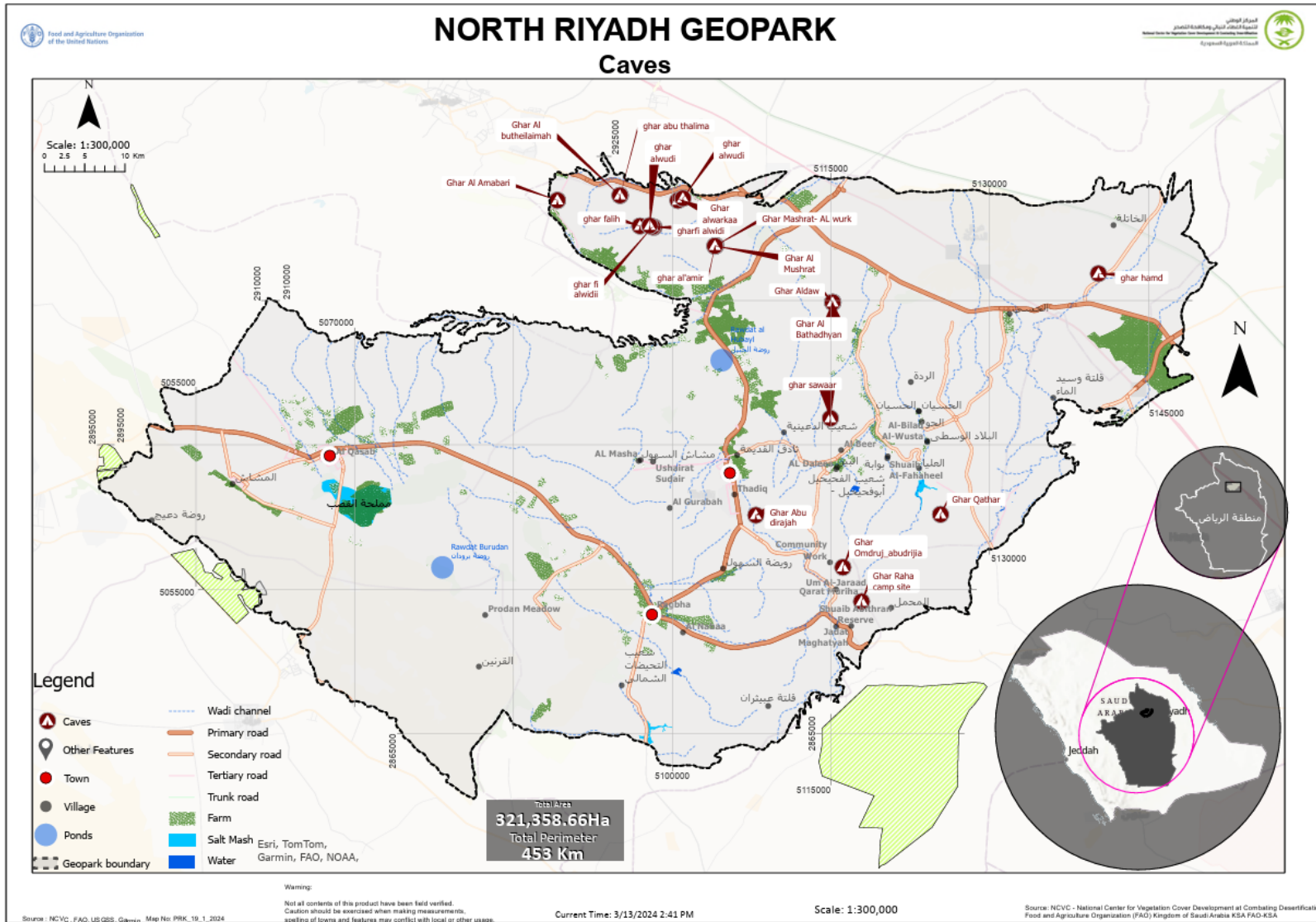
These desert caves are of geological, ecological, historical, recreational, and educational value as briefly highlighted in the section below.

- ❖ Recently cave tourism or explorations is getting popular in the kingdom where more caves are being developed into tourist caves. These rare and hidden gems are aesthetically appealing, have recreation value and are popular with the resident locals especially on the weekends and in summer months. Most of the caves are wide enough to host families and have soft, flat sandy floors that are comfortable. There evidence of walking tracks, fires and stone wall claddings to improve them in good condition for the public. It is important that they are effectively preserved, protected, and sustainably managed since they have potential to attract massive visitations. Presently, they are maintained by the Thadiq National Park management team to make them accessible and friendly for recreation use.
- ❖ From the geological point of view, these caves are mainly composed of limestone rocks formed over millions of years ago from calcareous shells deposits and skeletons of organisms that once flourished in the Arabian Peninsula. Survey and scientific examination of the caves will provide more information on the geological formations.
- ❖ Ecologically, these caves can be considered important to both flora and fauna biodiversity. For instance, they are hiding grounds for birds, bats, and carnivores such as Arabian foxes, wolves and hyena that emerge only at night to hunt and retreat to the caves for safety during the day.
- ❖ Historically, these caves were used by local and Bedouin communities to escape from the heat, cold and wind-blown sand from the harsh desert environments. In fact, some caves had brackish pool of water in pits, which were a source of water for the Bedouin communities several centuries ago.
- ❖ The caves can also be used for scientific research and academic studies. For instance, surveying, mapping and examination of bones, pollens, spores, dust and silt that have been trapped within the caves can provide information about geological formations, surface processes, flora and fauna that existed in those areas previously.

Picture 4: Some cave features in the area



Figure 10: Location of some caves within North Riyadh Geo-Park



3.1.3: Sub surface sink hole (Dahal Al Khatlah) at Wadi Buseitain

There is one mysterious and gigantic sink hole (Dahl Al Khatla) located in a remote un-habited area at Wadi Buseitain near Al Khatlah village. The sink hole is an enormous geological depression which could have been caused by various mechanisms and stretches over a significant area. The site where the sink hole exists has been temporarily fenced by mound of sand, gravel, and debris. (see figure 8 below). Investigations are recommended to provide detailed investigation on its typology, possible causes (whether natural or human induced) and related risk issues. The geomorphological explanation of this natural sink hole would be of interest to visitors.

Picture 5: Location of Dahl Al Khatla sink hole.

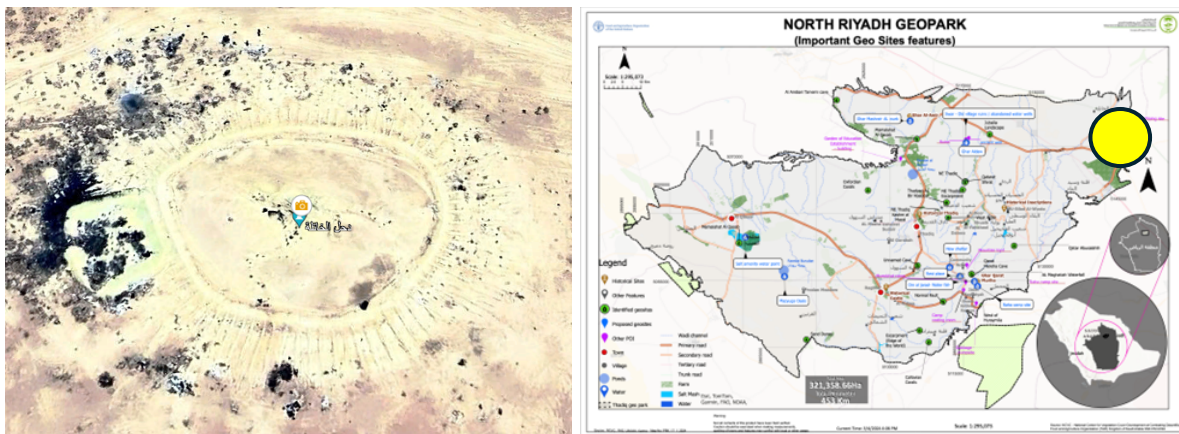


Image Source: Google Earth, 2024 Airbus

The site is threatened by pollution from disposed carcasses of animals from nearby farm. The area is evidence of dumped domestic wastes possibly by the local communities in the area (see images at pictures 6).

Picture 6: Dahl Al Khatla sinkhole with dumped wastes including livestock carcasses.

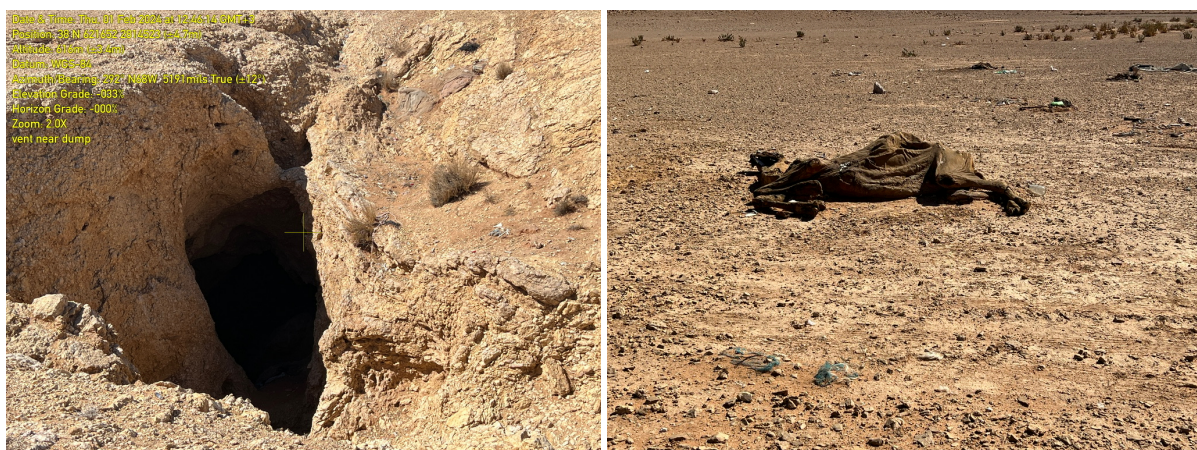


Photo Credits: Steve Kamerino and Photo credits: Tony Charters, 2024.

Awareness should be raised among the local communities and government bodies in the area on this sink holes and possibly the locations and distributions of other sink holes in the area surveyed and mapped out.

3.1.4: Water Source points

The North Riyadh Geo-Park area has several water sources such as the *buhayrat Mazyuqa* also named **Prodan Oasis** (see image at figure 9), *Buhayrat 'amtar, Oasis of the heart, Ain Turki Al Aqla* spring, seasonal lakes such as *Rawdat Al Hubayl* and *Rawdat Burudan*. Other water point sites are shown in figure 11. These seasonal water from either erratic rainfall or beneath surface layers of sedimentary rocks formed during the Cenozoic and Mesozoic ages. When the rain is scarce, as is normal with desert rains, water salinity increases in these water sources.

These oasis and other seasonal water source points are surrounded by red (ochre) colored sand dunes. They provide excellent viewing and wonderful photographic opportunities especially during the rainy seasons when there is significant flow of water. They are colonized by hygrophilous vegetation communities that are occur mostly in very restricted places close to water points. These areas are however threatened by several waste plastics thrown by people visiting these water source areas (see pictures 8).

Picture 7: Oasis Mazyuga as shown from google earth images.



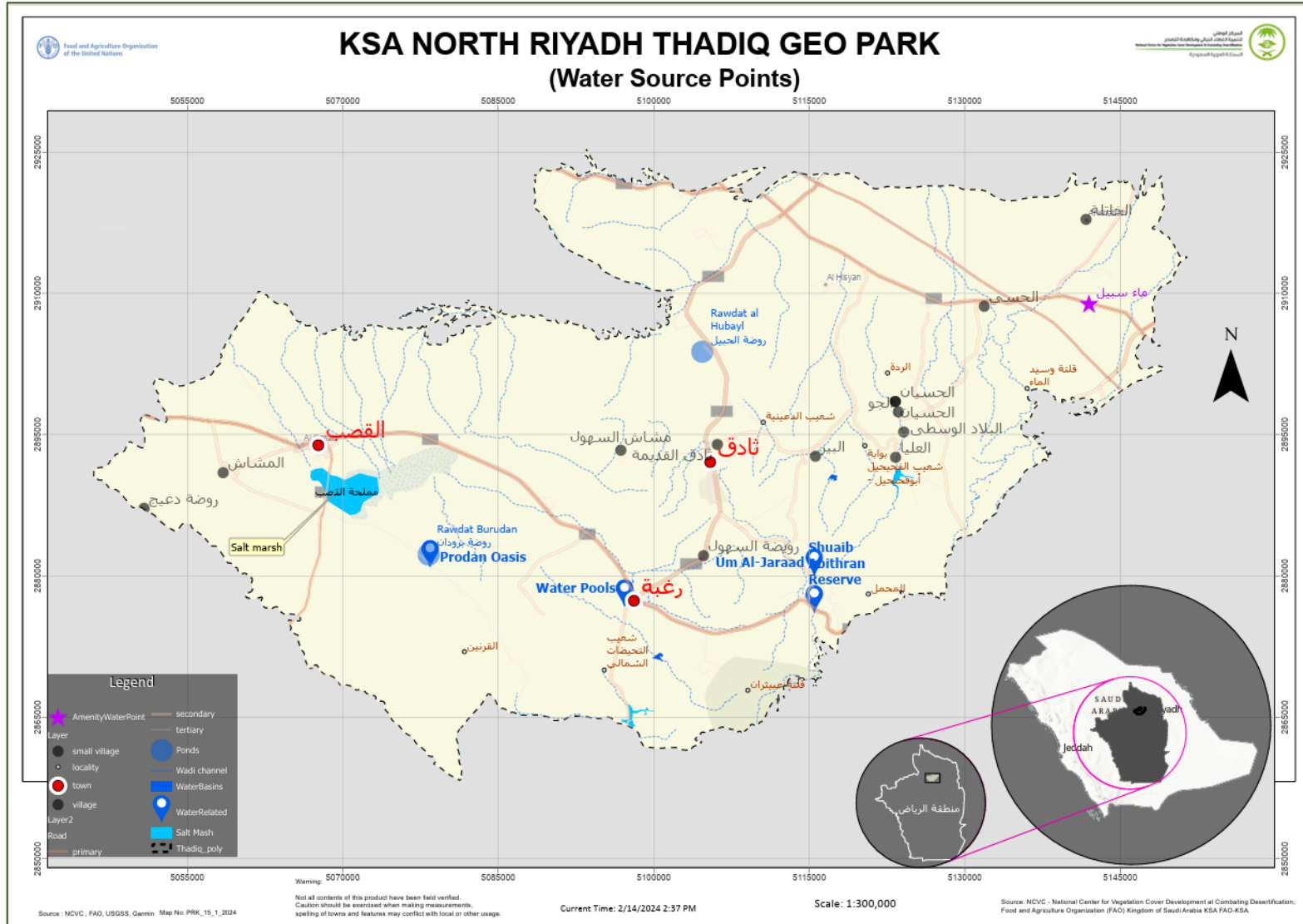
Source: Google Earth Image, 2024 Airbus

Picture 8: Oasis Buhayrat Mazyuga



Photo credit Steve Kamerino, 2024.

Figure 11: Water source points.



3.1.5: Sand Dunes of Ad-Dahna desert

The area has very impressive range of sand dunes systems spread laterally and surrounded by impressive viewpoints of Tuwaiq mountain ranges. This is part of the great corridor of striking reddish sand dunes of Ad-Dahna desert that is located approximately 80Km northeast of Riyadh city.

This desert is approximately 45,000km² and extends for about 1,300km from North to South. The mostly **reddish sandy terrain** of Ad-Dahna desert spreads horizontally acting as a bridge between two greatest deserts for the Arabian Peninsula. It links the northeastern edge of **An Nafud Al Kebir** to the northwestern borders of **Rub Al-Khali** (the Empty Quarter) desert.

Some sites have active sand mining operations to support the building industry in the Kingdom. It is crucial to note that this is a legitimate activity since geo-parks have multiple use objectives. The threat, however, is on the tracks that are using the road to the mining areas. They dump building wastes (presumably backloading of wastes of building materials as they head to load the sand). This has major negative aesthetic and environmental impacts in the area.

Picture 9: Sandy terrain with reddish sand dunes



Photo credit: Steve Kamerino, 2024

Touristic activities that can be developed or enhanced in this area sand dune areas within Thadiq geo-Park boundary include quad biking, drifting, sand boarding, picnics, camping to enjoy sunsets etc. Some of the existing areas with their attractions within the sandy terrains are shown in table 3 below.

Table 3: Some of the attraction sites at the sand dunes areas within geo-park.

Site Name (English)	Arabic Name	Location	Attractions
Buhayrat Mazyuqa	بحيرة مزبوقة	5JQC+W4 Tharmda 15275	Oasis in the sand dunes
Ain Turki Al-Aqla	عين تركي العقلا	5JQC+Q4 Tharmda 15275	Underground water spring in the oasis
Qarat alfahda	قارة الفهدة	5GVJ+9M Tharmda 15527،	National Park
Rawdat Al burdan	روضة البُردان	5M54+V3 Rughabah, 15522	National Park
Khubat Aljadii	خبة الجديي	3MX5+3QJ Rughabah 15275	Kids playground
Qalban aljlyl	قلبان الجليل	4JXW+PMP Rughabah 15275	National Park
Wahat nahil (Palm Oasis)	واحة نخيل	3JFC+7W Tharmda 15281	Tourist attraction
Buhayrat 'amtar	بحيرات أمطار	3M73+PR أم سليم 15281	Oasis in the sand dunes
Rawdat Tarif alhabal	روضة طريف الحبل	2JCW+H83 أم سليم 15280	Wildlife Park
Nafud Tarif alhabal	نفود طريف الحبل	نفود طريف الحبل، محافظة مرات 15523،	Tourist attraction
Rawda	روضة	2J8V+GC2 Marat 15280	Recreation Park
Jabal Al Qarinayyin	جبل القرينيين	4JF6+2W Tharmda 15275	Tourist attraction
Sheikh Fawaz Al Suwaid camp	مخيم الشيخ فواز السويد	6H94+4C Al Qasab 15598	Camping ground
Oasis of the heart campground		6HC8+68 Al Qasab 15598	Camping ground
Al zubarah fi alqasab	لزبارة في القصب	6H8J+FX6 Al Qasab 15598	Farm
Naqra Al Sayyari	النقرة . نقرة السيارى	6H8C+RF Al Qasab 15598	Farm
Al-Zubarah the sons of Ibrahim Al-Zahim	الزبارة لأبناء إبراهيم الزاحم	6HCF+P68 Al Qasab 15598	Farm
Faydat saqr alqasab	فيضة صقر القصب	6FHF+5C Uthaihiyah 15593	Recreation area
Eashirat alzaahin almaraziq	عشيرة الزاحم المرازيق	6FWF+4X Al Mishash 15593	Recreation Park
Nukhayl al 'Abd		Nukhayl al 'Abd' 15588	Recreation area

3.2: Biodiversity Values

The North Riyadh Geo-Park is also characterized by outstanding and uniquely diverse natural features that are responsible for the ecological characteristics of the area. These resources represent the area's natural capital and are vital in maintaining the areas desert ecological characteristics of the Najd plateau. Biodiversity in Najd desert is characterized by low numbers, localized habitats, and extreme fluctuations. The Geo-Park is of biodiversity importance since it forms critical habitats for plant species and wildlife at the Wadi channels, plains, and highland areas. Some of the key biodiversity and scenic values that this management plan aims to maintain or improve are mentioned and briefly discussed in below.

3.2.1: Scarce and scattered perennial and seasonal vegetation cover

Due to scarcity and shortage of rainfall, the vegetation cover per km² area, is extremely weak as reflected in scattered areas and floodplains. Most of the wild (perennial and seasonal) plants grow naturally without any assisted intervention and adapt well in the extreme desert and semi conditions.

The **perennial plants** are fewer in numbers exist for longer years and are well adapted to desert conditions such as the extreme high temperatures, scorching sun, and dryness. They commonly grow along the wadi channels, flood plains and meadows.

The dominant ones are *Vachelia radiana*, *Aerva javanica*, *Zilla spinosa*, *Farsetia aegyptica*, *Lycium shawii* (desert thorn or Arabian box thorn), *Anvillea garcinia*, *Pergularia tomentosa*, *Fagonia indica*, *Haloxylon salicornicum*. Sandy areas are dominated by *Vachelia radiana*, *Scrophularia desertii*, *Teucrium oliverianum*, *Lavandula dantata*, and *Diplotaxis harra*,

Most **seasonal plants** establish quickly during rainy seasons in winter months but have a short-term growth season. The wildflowers emerge and the landscape comes alive. They, however, wither away and dry up on the onset of droughts periods due to lack of moisture and exposure to high temperatures making the area look lifeless and barren. Seasonal plants in the area include flowers and herbaceous layers such as *Al Khuzama* (lavender) flowers, *Sheeh* (*Artemisia herba-alba*), and pepper cress (*Lepidium sativum*) among others.

The area also has **plants of High Conservation priority** in the Kingdom of Saudi Arabia such as *Salvadora persica*, which requires special attention. This plant is edible, widely known and used as chewing stick ("miswak") and is well appreciated for its medicinal value by the local community members.

Picture 10: Some of observed vegetation in the area



Photo Credits: Tony Charters, 2024

3.2.2: Wild animals

Opportunistic observation reveals very limited fauna in the area. Most of the available wildlife species are endangered and adapted to such extreme harsh environmental conditions. Like other places in the middle of the Arabian Peninsula, Thadiq Geo-Park has wild animals that exist in small populations in localized habitats. They include;

- ❖ Mammals such as the Arabian red fox, wolf, wild cats, hare, rock hyraxes and the rare desert rodents (lesser jarboas).
- ❖ Common birds in the area include Spanish sparrow, hawks, steppe eagle (endangered species on the IUCN red-list), pale crag martin, Eurasian collared dove, and white wag tail.
- ❖ Common reptiles in the area include small-spotted lizard, the Awl-headed snake and the dangerous desert scorpions.

Picture 11: Observed Faecal matter and footprints of wildlife animals in the geo-park

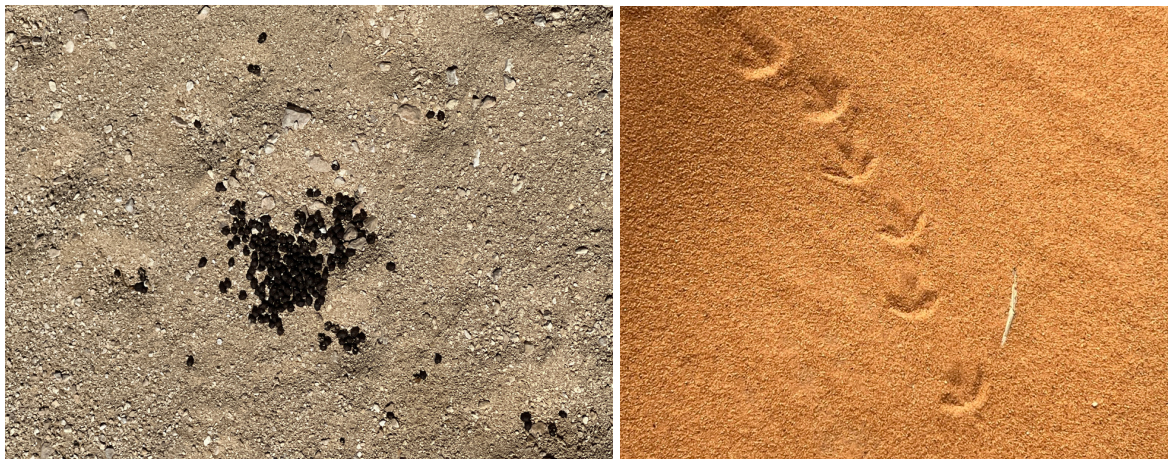


Photo credits: Tony Charters, 2024

Due to threats from construction of road infrastructure, extreme harsh desert conditions, and unregulated hunting using modern firearms, has led to some wildlife species becoming extinct. Hunting is evidenced by spent cartridge shells observed in some areas in the geopark. Unless this threat is controlled, it will have significant negative impact on the conservation status of wildlife species and opportunities for wildlife viewing within the geo-park. Some of the mechanisms that can be used to minimize this threat include education and awareness to the local communities. This should be supported by increased patrols from the geo-park staff especially along the identified hunting hot spots.

3.3: Scenic Values

The Geo-Park area lies in the middle of a flat basin surrounded by scenic and famous landmark features that should be well conserved, preserved, and sustainably managed for the benefits of present and future generations. They are briefly discussed in the sections below.

3.3.1: Mountainous landscapes of Jabal Tuwaiq, Al Ghuraaba and Uraidh.

The rugged and imposing mountainous landscapes of **Jabal Tuwaiq** is part of the Tuwaiq mountain ranges that runs from the southern borders of Al Qassim (intersects the Najd Plateau of central Arabia) to the northern edges of the Empty Quarter desert near Wadi Ad-Dawasir.

On the western side, Jabal Tuwaiq plateau ends abruptly in cliffs of several hundreds of meters high on Qiddiya, Huraymila, Thadiq and Al-Ghat with a succession of laminated rocks rich in organic matter. The cliffs and rocky outcrops in Thadiq are in form of convex arcs oriented to the northwest and south. They have uneven edges and several peaks such as *Khashm Al Hissan*, *Khashm Al Turab*, *Khashm Al Hussain*, *Khashm Al Isba* and *Khashm Al Maqyuud* that provide excellent and scenic viewing opportunities in the area.

Equally, since they are among some of the most ecologically disturbed areas especially by desert wind and water erosion agents, they need to be conserved and well managed since they also form crucial habitats for biodiversity.

3.3.2: Valleys (wadis) and mountain passes

The area has a deep and narrow valleys and mountain passes that descend from *Tuwaiq*, *Uraidh* and *Al Ghuraaba* mountains. Some of the most famous valleys (wadis) and passes in the area include *Wadis Obaitheran*, *Al-safrat*, *Khashm Al Hissaan*, *Khashm Al Turab*, *Al Hossain*, *Al Mutaridah*, *Al Tarafiyyah* and *Al Sibbaah*. Most of these valley lower courses end up at *Sabkhat Al Qasab*.

These valleys and passes are important because during rainy seasons, they are inundated and flooded forming a dendritic network of drainage channels where water flows to their lower course. The flood waters are deposited in the surrounding plains where meadows and pastures emerge before the water eventually disappears into the sand. This makes the valley channels stand out based on biodiversity composition since they are reasonably well vegetated. They form ecologically diverse but fragile edge habitats due to their higher moisture content.

3.3.3: Plains area occasionally with meadows and pastures

The plains area is formed from the retreating edges of the *Tuwaiq* mountain and erosion agents of desert wind and water. For instance, when there is strong desert wind blowing in *Najd* desert, the soil is eroded and blown to the valleys and sand dunes. During the rains, the fertile soils are carried through the wadi channels and deposited to flat areas which become meadows and pasture areas for livestock and wildlife. Such areas in *Thadiq* include *Um Al Shuqooq*, *Al Ruwaidh*, *Al Nisswaan*, *Al Tuhaidha*, *Al Sibbaah*, *Um Sidr*, *Al Katheer*, *Al Burdan*, *Al Turaif*, *Um Raghah* and *Al Dhaaleek*.

3.3.4: Floodwater canals and water retention structure (Al Mudareej)

The area has about 100 flood water canals and surface flow retention structures that have been constructed on the lower courses of the several wadi channels. There are plans to increase them to over 600. These structures serve several purposes including distributing flood water to farms, minimizing rate of soil erosion, and enhancing the rate of vegetation recovery and regeneration along the lower courses of wadi channels. For instance, the structures have been constructed at ***Al Mardan*** site being close to the *Thadiq* National Park entrance. (see pictures below). The base of these structures has not been sealed off to allow the water that accumulates to infiltrate and recharge the ground water sources.

The walls of the dams are erected perpendicular to the gradient of the wadi channel to regulate surface run-off and help in soil erosion control. Over rainy seasons, surface run off water is retained behind around these structures, sediments settle and form micro habitats for trees, shrubs, and ground cover plants to recover and/or regenerate naturally. Since ecology of those areas is inextricably dependent on surface and underground water for growth and recovery, the structures have also been advantageously designed to include spill ways to discharge excess water downstream (see pictures 8).

Picture 12: Surface run off retention structures ("Al Mudaraj").



Photos credit: Steve Kamerino, 2024

3.4: Cultural Heritage Values

The fact that Thadiq governorate was a prominent historical corridor linking Riyadh region to Makkah, makes it have a remarkably rich, diverse, and unique cultural heritage that is deeply rooted in history. Concentration of the historical and cultural resources in the area represent its history. They include historical sites with inscriptions, heritage museums, historical castles, observation towers, villages ruins in several urban areas.

These cultural heritage values in this area offers a considerable opportunity for development of varied cultural tourism products that would appeal to different market segments. Most of the historical places identified by NCV in 2023 are shown in figure 12, pictures 9 and 10. They are discussed briefly in the sections below.

3.4.1: Al Jeraissy historical castle and Al Maqrab Tower

This castle was a palace dating more than 5000 years ago. It was a strong and fortified castle with links to Jeraissy family since it was built by *Ali Al Jeraissy*, who was the Emir of Raghbah.

A tour of the castles internal compound reveals numerous artefacts, a courtyard with several housing units divided according to use and exposed foundation buildings of ancient ruins. A water well was centrally located centrally to supply the castle residents with water for a long time.

The historical castle has four sides surrounded by strong wall built with a beautiful architectural mix of natural stone, clay, and mud. The walls were made of special mud layers that made them strong. The castle had four watch towers arched on each corner with several observation holes that were used for monitoring enemy movements. These offer magnificent views of the area including the old Rughabah village.

Currently, the site is undergoing restoration to high standards and will soon be re-open to the public as a heritage attraction museum.

Picture 13: Al Jeraissy historical castle



Photos credit: Steve Kamerino, 2024.

Al Maqrab Tower. This is one of the most famous and tallest ruins in Najd area with a height of 22 meters. The tower was built in 1297 AH (1880 AD) with high level of architectural ingenuity and artistry. The tower had several functions;

- ❖ One was for monitoring movements into Raghbah and warn residents of impending danger of invasion, and the other,

- ❖ was to monitor herds of camel and sheep in the grazing lands so that they are not stolen.

The tower was built using mud and bricks where cylindrical stones were stand together to form a collum which was wide at the base and gradually as it ascends. To fortify and strengthen the tower, it was divided into six sections by stone tiles (called *al saaf* or *al midmaak*) that decrease in width as the height increases.

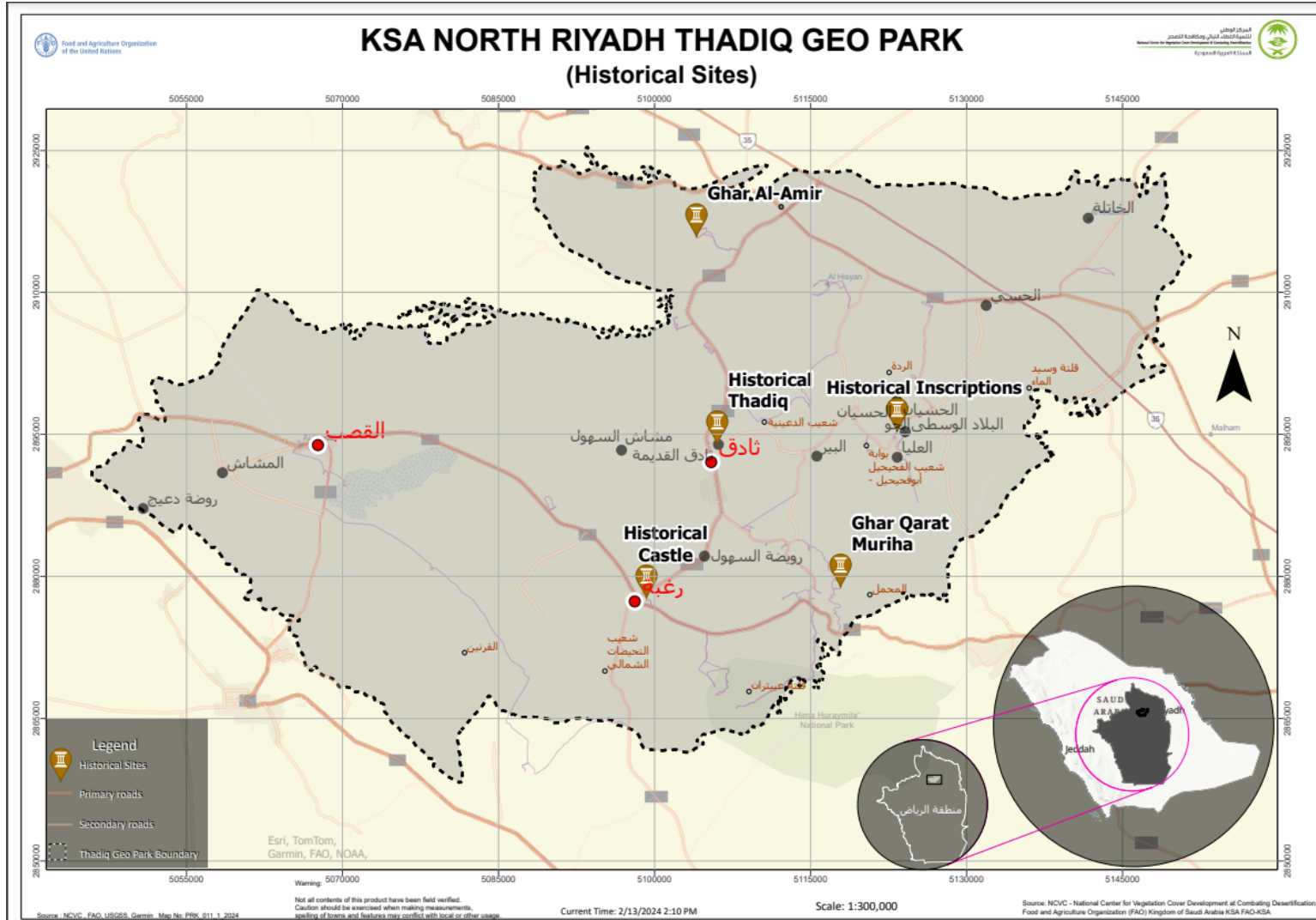
It is possible to climb the Raghbah watch tower to the top to view the surrounding ruins and landscape. Inside the tower, there are spiral staircases that are wide at the lower sections of the tower and narrows as you progress towards the top. The tower also has eleven openings called "*mazaghir*" for observation, lighting, and ventilation.

Picture 14: Maqrab Tower surrounding ruins in Raghbah



Photos credit: Tony Charters and Steve Kamerino, 2024.

Figure 12: Some of the historical sites in North Riyadh Geo-Park



Data Source: National Centre for Vegetation Cover and Combating Desertification, 2024.

3.4.2: Ancient ruins of villages such as Ushaiqer Heritage Village

Thadeq area has several village ruins of traditional houses in several places that were built dating back to the pre-Islamic and Islamic era using mud, water, and straw. These houses had ancient Arabic architectural details, decorations, and designs of brick and mud brick buildings. These villages were established as dwelling area mostly at the lower courses of the wadi sections.

A good example is the ***Ushaiqer heritage village*** with traditional markets such as ***Hlewa heritage market*** in Rughabah, that is one of the oldest settlements in the region with stunning traditional Najd architecture. They are also a perfect example of indicating that earlier human settlements within the Najid Plateau had rich social and economic lifestyle and had adapted to the harsh desert environment conditions.

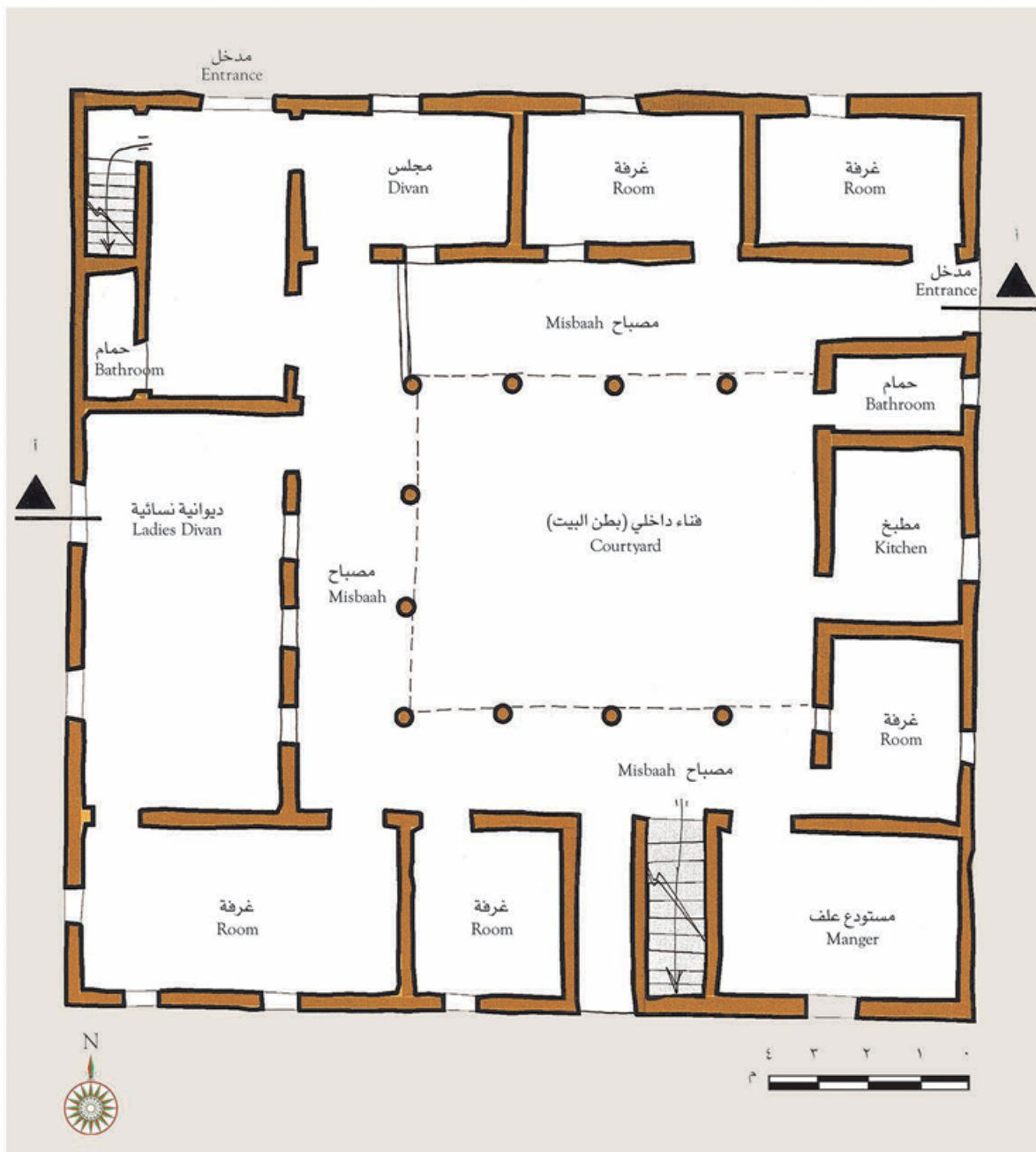
The traditional houses had rectangular shapes and divide in two parts each with their own entrances to cater men and women separately. The floor designs were such that it several rooms opening towards the internal courtyard that was surrounded by a roofed open corridor called "*almisbaah*". The rooms were apportioned according to their use. For instance, a sitting area called "*divan*" is the biggest and used for receiving guests. The other rooms include a kitchen, bathrooms and family sleeping rooms. See figure 12 for a representation of floor designs of the traditional houses.

Picture 15: Some villages with traditional style houses in Rughabah old village



Photo credit: Steve Kamerino, 2024.

Picture 16: Representation of ground floor plan for traditional Arabic house



Source: Khaled Ibn-Rahman Al Jeraissy, 2006. (second edition-2012).

3.4.3: Heritage museums

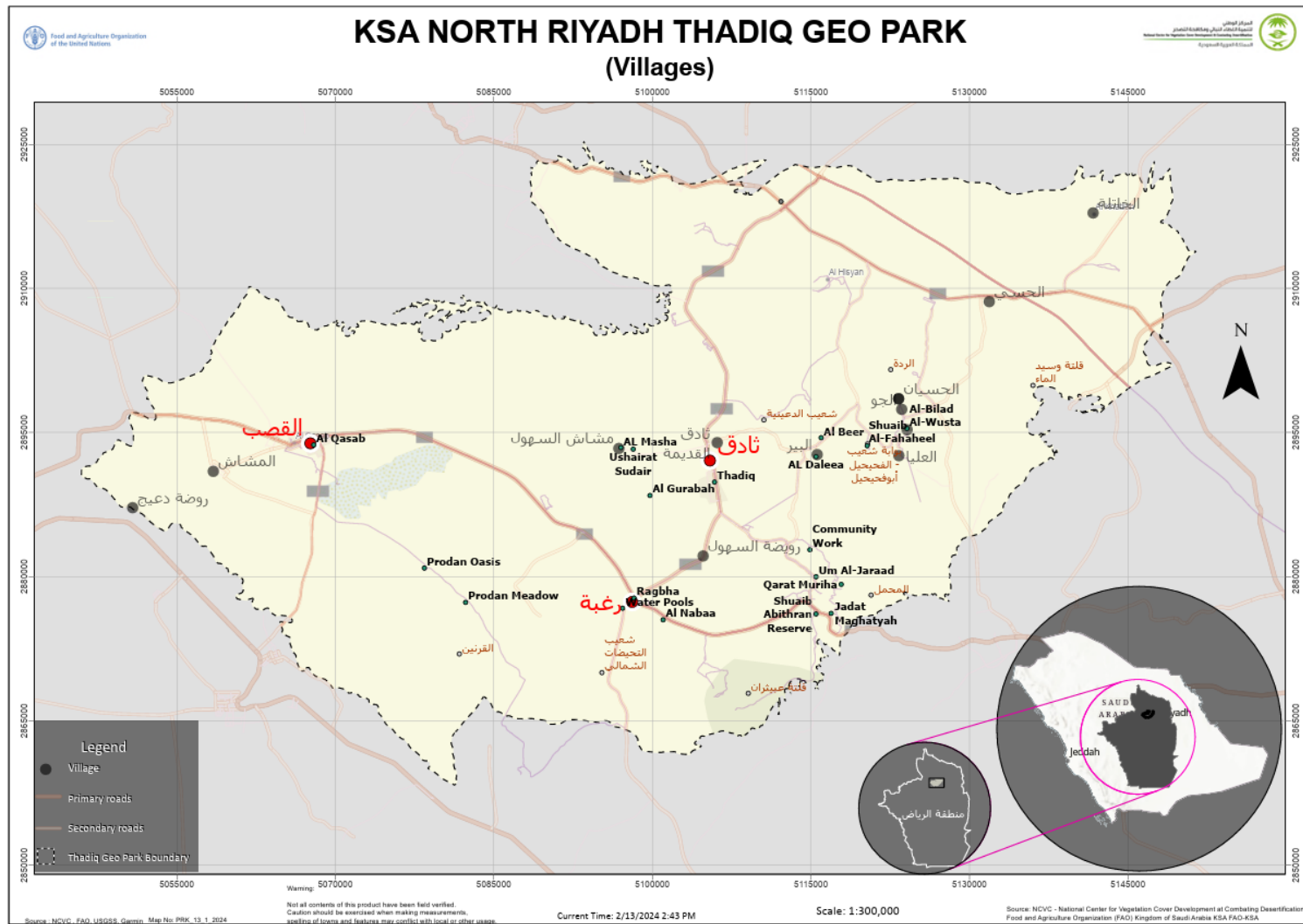
The area also has heritage museums with several exhibits including photography, fine art, handicrafts, and ancient writings and recordings. For instance, in Ushaiqer heritage village, there is a small museum (**As-Salem Museum**) which has a collection of antiques, treasures and exhibits showing the glorious past of the region.

Picture 17: Exhibits at As- Salem Museum in Ushaiqer heritage village



Photos credit: Steve Kamerino, 2024.

Figure 13: Location of some villages within North Riyadh Geo-Park in Thadiq



Data Source: National Centre for Vegetation Cover and Combating Desertification, 2024.

3.4.4: Traditional customs and cultures

The villages of Thadiq governorate landscape are occupied by the mixed Saudi Arabian tribes. There are five predominant tribes within the landscape especially in most of the village areas: Dawasir tribe (predominant in Thadiq), Subay tribe (predominant in Ar Raghbah), Suhul tribe (predominant in Mishash As Suhul) and Utayba tribe (predominant in Ar Ruwaydah (Itban). The remaining tribes of Al-Qahtan and Rashayda are represented in small numbers. Other tribes within Thadiq governorate include Bani Tamim, Bani Khalid, Al-Zamil, Shammar and Al-Ashraf.

All these tribes have their own unique traditions, customs and values that reflect the Arabic culture of Najid plateau population. They include poetry, storytelling and literature, traditional cuisines, folklore arts and dances. These were the medium through which they expressed their feelings, emotions, all of which celebrate their culture and glorious history. The various aspects of the regions tribe and culture are expressed in local dialects.

Traditional customs and cultures play a crucial role in shaping the landscape and interpretation of Geo-Park areas. They interact strongly with the regions ways of life that support the local communities especially in the harsh conditions of the Najd. It is important that they are preserved and passed on from generation to generation.

The regions culture and traditions are of great interest, especially, to international travelers and provide opportunities for presentation of local produce and cuisines. This also provides opportunities for local businesses to develop around the Geo-Park. This includes but not limited to local tour operators, café's, restaurants with local cuisines and sale of locally packaged products.

Picture 18: Some of the cuisines in Thadiq region



Photo credits: Steve Kamerino and Tony Charters, 2024.

3.4.5: Agricultural Farms

The link between the Geopark and productive agricultural areas is crucial and of great interest to travelers. It provides opportunities for presenting local products to visitors and the local business to develop.

Agriculture was also earlier practiced in farmlands mainly in the village areas of Ar Ruwaydah (Suhul) and Ar Ruwaydah (Itban) due to the favorable soil conditions and water availability. In these areas, adequate underground water is found along the major wadis and fluctuates depending on the rainfall patterns.

Currently, there are over 250 farms with potential for agritourism opportunities spread within the precincts of Thadiq Geo-Park (see figure 14). Most of these farmlands have perennial and seasonal crops. Noticeable perennial crops in the farms include palm trees, clovers, grapes, figs, pomegranates, and citrus fruits (lemons and oranges). The seasonal crops in the area are usually grown for short periods and vary depending on seasons. They include wheat, barley, and vegetables such as tomatoes, cucumbers, eggplants, and zucchini.

The residents also practice animal production keeping mainly camels, sheep, and goats of both traditional and specialized breeds. These practices are passed on from one generation to another. As discussed elsewhere in this plan, there are areas that have meadows for grazing such as *Um Al Shuqooq*, *Al Katheer*, *Al Burdan*, *Turaif Al Habl*, *Shaq Raghbah*, *Khashm Al Maqyood*, *Nufud Raghbah*, *Khashm Al Hissan* pass, *Al Sibbaah* Pass among others.

Picture 19 Some of the local agricultural products in the region



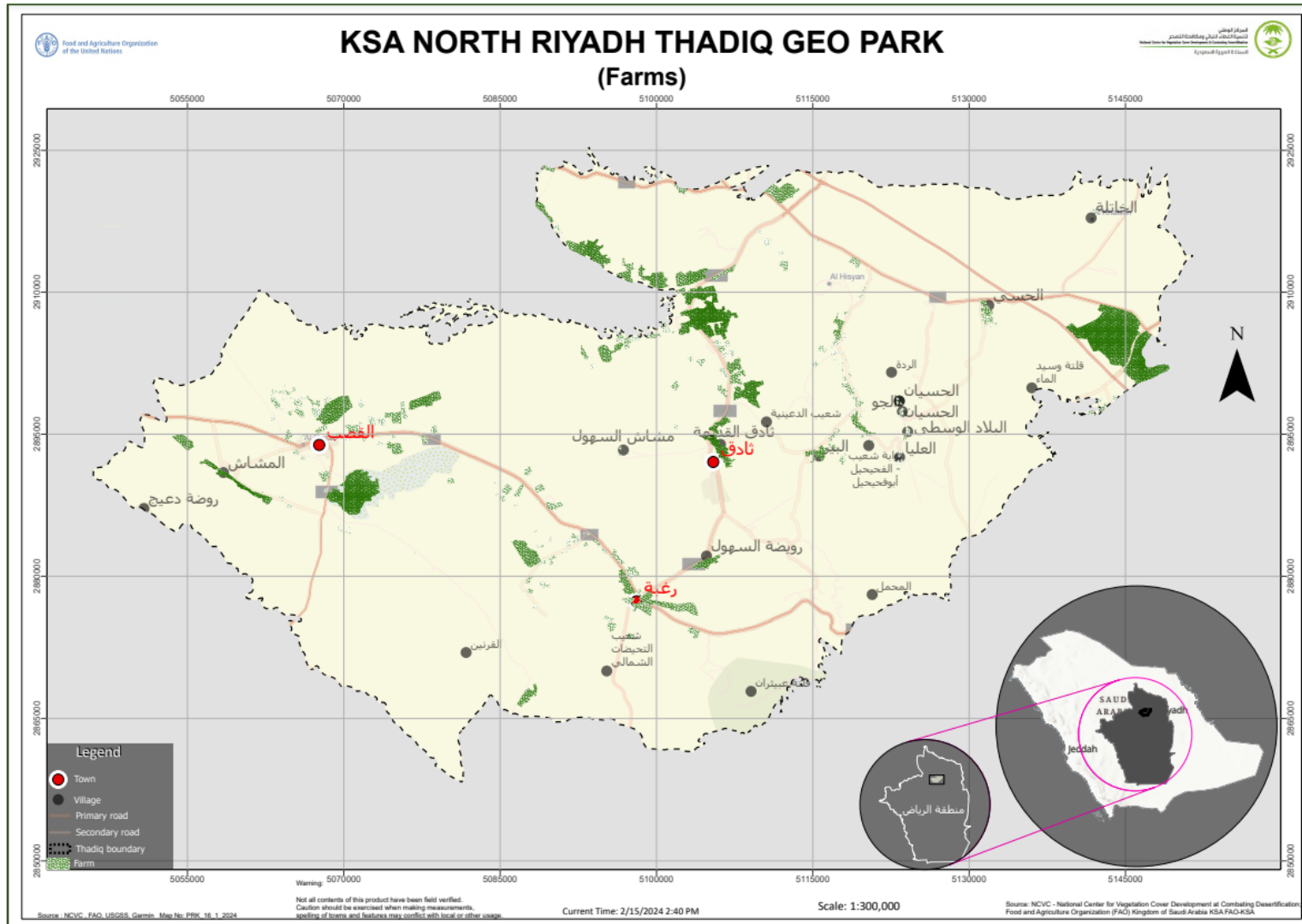
Photo credits: Steve Kamerino and Tony Charters, 2024.

Picture 20: Some of the farms within North Riyadh Geo-Park in Thadiq



Photos credit: Steve Kamerino, 2024.

Figure 14: Some agricultural farms within North Riyadh Geo-Park in Thadiq



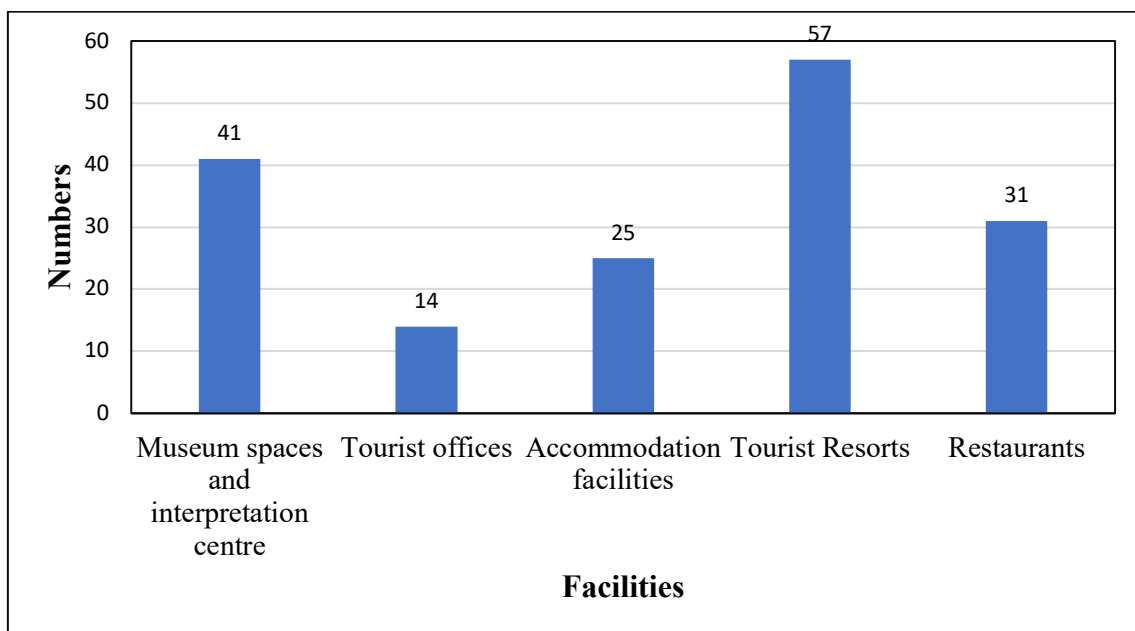
Data Source: National Centre for Vegetation Cover and Combating Desertification, 2024

3.4.6: Tourism Support Facilities

Recreation and geo-tourism use are very important for Global Geo-Parks. They improve on economic benefits and employment opportunities for the local communities. As discussed in previously, Thadiq Geo-Park enjoys unique combination tourist attraction elements. The area has a strong mix of attractions elements categorized into geological, natural, and cultural values. These values provide extra ordinary opportunities where recreation and geo-tourism development can be explored, tapped, and enhance. Secondly, the is highly accessible, serviced by an excellent road system and just 115km from the Riyadh city and the International Airport.

The region has very good support infrastructure and facilities that contribute to the development of geo-tourism in the area. There are about 168 infrastructure facilities that were identified within Thadiq Geo-Park. These include Museum spaces and interpretation centers, tourist offices, tourism accommodation facilities, Resorts, and restaurants which are easily accessible and distributed across the area. (see figure 15 below).

Figure 15: Some tourism support facilities within the North Riyadh Geo-Park environs.



Source: National Centre for Vegetation Cover and Combating Desertification, 2023.

Picture 21: Some of the existing camping or picnic facilities in the area



Photo credits: Steve Kamerino and Tony Charters, 2024.

3.4.7: Local Community Support and Participation in development of Facilities

Meaningful community engagement is a vital and necessary part of establishing Global Geoparks. It is important to note that local community support has been very instrumental in Thadiq Geo-Park. This is demonstrated through significant support through plantation and restoration of vegetation, construction of the Al Mudaraj water retentions structures and other recreational facilities.

Thadiq Philanthropists, businessmen and nature enthusiast have contributed heavily to funding these projects. This is very commendable and clear example of local community involvement in conservation. It should be emulated by the rest of the regions in the Kingdom.

It will be important to continue and grow the involvement of the community through informal and formal means. This will include management committees and advisory committees. Some of the community members have identified that there may be a need for some level of assistance to facilitate small to medium businesses to develop in the Geopark. Therefore, there will a need to meaningfully engage the community in identifying private or community investment opportunities both on the Geopark and in adjoining towns and villages that can benefit from the establishment of the Geopark.

It is also recommended that NCVC invest primarily in infrastructure that will facilitate small businesses to establish tours, for example through dedicated tour operator wayside stops, interpretive centers, walking tracks and lookouts.

Also, of important to note the commitment of the National Park Manager at Thadiq. He is an experienced stonemason and has developed numerous facilities using recycled and local quarry building stones donated from the community. The quality of the work is outstanding and the stonework structures are aesthetically appealing with designs of traditional approaches. They have great visual appeal and a link to heritage building techniques.

Given the skills that have been developed by the Manager it is recommended that training programs be developed for other NCVC staff across the Kingdom. He has trained work crews in stonework and now has the capacity to undertake significant projects very efficiently, to a high standard.

Picture 22 Some of the projects that have received massive local community support.



Photo credits: Steve Kamerino and Tony Charters, 2024.

Chapter 4: Threats and Management Issues of Concern

4.1: Management Issues of Concern

Identification of threats and management issues of concern to Geo-Park values was conducted through brainstorming sessions by the Core Planning team, consultation of various subject matter experts and key stakeholders. The identified governance and management issues of concern affecting the Geo-Park are highlighted in table 4 below.

Table 4: Identified management issues of concern.

Issue Category	Identified Management Issue of Concern
Infrastructure	Limited administrative infrastructure (e.g., lack of office buildings and associated facilities) to support day to day operations.
Staff Capacity	Inadequate staff capacity (both in numbers and technical expertise) to effectively manage Geo-Park operations.
Stakeholder engagement	Limited collaborative stakeholder agreements with well-defined roles and responsibilities for each partner groups.
Funding	Limited funding and budgetary allocations to sufficiently manage, conserve and preserve geo-park resources
International Recognition	Lack of international status recognition such as (confirmed UNESCO Global Geo-Park Status). Confirmation of these global status could reinforce protection, governance and management measures against threats facing the Geo-Park sites.
Geo-Tourism	Insufficient activities and services developed to support geo-tourism
	Localized visitor impacts through littering and offroad driving
	Limited visibility and identity as visitors geo-park destination in Riyadh region.
Geo-Education	Low awareness among the local communities on the geological heritage of the area.
	Limited information about cultural heritage, traditions, and geo-heritage values that can attract international visitors.

Source: Core Planning Team Analysis

4.2: Threats and Management Issues of Concern to Geo-Park Values

Threats were considered as “major factors that have potential to destroy, degrade or impair the focal conservation targets, cultural heritage values, geological values, and other associated exceptional resources (ERVs) in the long term, say over 10 years. These threats could result either directly or indirectly from human related activities or natural factors.

The identified threats were subsequently reviewed, ranked, and prioritized according to their significant impacts in terms of potential level of damage (**severity**) and the geographical extent (**scope**) that is expected in the long term under the current circumstances. The results of the threat assessment and the magnitude level of threats is presented in matrix shown in table 5. The extent of threats within the sites is widespread and impacts range from moderate to high.

There is currently no strategy to address these threats and pressures that the National Parks are facing. This exercise provided the basis for the development of management strategies and actions of this management plan.

Picture 23: Some of the threats within Thadiq Geo-Park



Photo credits: Steve Kamerino and Tony Charters, 2024.

Table 5: Detailed assessment of threats and management issues of concern to Geo-Park values.

Threat Category	Identified Threat	Values threatened
Biodiversity use	Cutting of woody plants	Vegetation cover
	Wildlife hunting across the geo-park, evidenced by spent short gun cartridges. This is prominent in areas where birdlife is more abundant.	Birds Small-medium mammals
Agriculture	Grazing and browsing pressure from livestock such as camels, and goats	Vegetation cover
Invasive Species	Invasive plant species & weeds e.g., <i>Rhazya stricta</i>	Vegetation cover
		Wildlife habitats
Natural System modification	Habitat fragmentation	Vegetation cover
	Shifting sand dunes	Wildlife habitats
Climate and severe weather-related risks	Flooding at lower plain areas with meadows and pasture	Vegetation Cover
	Temperature extremes	Wildlife habitats
	Severe drought impacts that is drying salt flats	Mamlahat Al Qasab Wildlife habitats
Natural Resource Mining	Sand harvesting	Ad-Dahna sand dunes
	Salt mining	Mamlahat Al Qasab
Pollution generated	Pollution from Garbage wastes and litter (mainly plastics)	Oasis and water points
		Caves recreation areas
	Dumping of dead animal bodies	Dahl Al Khatla sink hole
	Solid wastes and garbage disposed enroute to sand harvesting sites.	Sand dunes
	Sewage and wastewater discharges from hotel and residential facilities.	Underground water points
Vehicle access to picnic and cave sites	Picnic areas and caves	
Geological Events	Erosion evidenced by presence of bare ground, rills, gullies, and sheet erosion)	Wadi channels
		Mountain passes
		Caves
		mountainous landscapes

Infrastructure developments	Residential housing and settlements expansion	Historical sites
		Ancient village ruins
	Commercial town and Industrial areas expansion	Historical sites
		Ancient village ruins
	Impacts from main and feeder roads expansion	Historical sites
		Ancient village ruins
Cultural & societal threats	Reduced cultural links to traditional practices and knowledge	customs & culture
	Natural deterioration of cultural heritage sites	Historical sites
		Heritage museums
	Population declines in the Geo-Park villages evidenced by the -2.5% annual change from the of the 2010-2022 KSA General Authority for Statistics census data. This is attributable on the migration to other cities in search for job opportunities, better education, and improved living standards.	Main Villages and farms

Source: Core Planning Team (CPT) analysis

Chapter 5: The Geo-Park Management Programmes and Actions

This section of the management plan outlines a set of recommended management interventions that if implemented will address the threats and management issues of concern facing the Geo-Park. The management programme and actions are based on guiding principles that were taken into consideration. The principles will influence the way management programmes are implemented to ensure that the geo-park values are effectively and efficiently managed. These principles are briefly highlighted in the sections below.

5.1: Guiding Principles

5.1.1: Effective Governance and Management of the North Riyadh Geo-Park

Availability of effective management systems and governance frameworks is integral in strengthening the administrative and management capacity at the Geo-Park. Clear governance frameworks are crucial in supporting effective delivery of targeted management interventions and overall purpose of the Geo-Park.

Generally, geoparks should have designated committees that incorporate key stakeholders. This committee will ensure that key stakeholders contribute to the decision-making process, thus shaping the identity and success in achievement of planned geo-park activities. In addition, clear rules and regulations elaborated by the management arrangements help in preservation and sustainable management of the exceptional resource values within the geo-park.

Preliminary review of the governance and management capacity of North Riyadh Geo-Park reveals several glaring gaps. These will be addressed using best possible management practices and governance structures.

5.1.2: Capacity Development

Assessment of existing vs desired capacity revealed several capacity gaps and needs. To strengthen management capacity at North Riyadh Geo-Park, there is need for adequate, motivated, and well-resourced workforce that is equipped with decision making competencies for management of Geo-Park natural and cultural resources.

Capacity development modalities need to be developed, strengthened, and mainstreamed across three dimensions of individual, organisational and at the enabling environment level. These are distinct but integrated levels that sequentially relate and interact with each other. Strengthening priority management capacity needs will be crucial in effective and efficient delivery of targeted management interventions proposed in this plan.

5.1.3: Collaboration with Local communities and other Key stakeholders

As discussed elsewhere in this plan, key stakeholders play an important and complementary role in supporting projects and programmes within Geo-Parks. Recognizing the value of stakeholders, enhanced collaboration and good communications with key partners will go a long way in successful management of the Geo-Park programmes and achievement of its objectives. For instance, funding is an essential part of facilitating geo-park management team to carry out preservation, awareness, and community development programmes.

Establishing collaborative partnerships with global, regional, and governmental agencies, NGOs and private sectors can provide the necessary financial support.

Local communities are the best ambassadors for geo-parks because of their knowledge of cultural heritage of the area. It is recommended that they be highly involved in sustainable use and management of the geo-park. Communities that are well informed and involved in geo-parks are likely to better understand, protect, communicate its values to visitors and contribute to its overall success. There are many opportunities for strong involvement with communities ranging from providing services in heritage ruins and museums, old towns and villages in Thadiq, Al beer showcasing ancient architecture (e.g. town and village walks etc) and facilities such as coffee shops and restaurants.

5.1.4: Enhanced Geo-Education and Awareness creation

The future desired state is where both the visitors and local communities understand and appreciate the natural, cultural, and geological heritage at Thadiq Geo-Park. This is especially important in gaining support and motivating the local communities to take actions that will enhance their participation in preservation and sustainable management of the heritage values.

This can be achieved by promoting extension services ranging from geo-education, outreach and awareness events, opportunities to participate in management and access to benefits from geo-tourism across the Thadiq Geo-Park landscape. The education and awareness activities can also be delivered through multiple of media such as information centers, websites, apps, and through the contribute of academic papers etc.

Awareness creation of the geopark and its values can also be achieved through information and interpretive materials. They range from communication tools and interpretive signages that will help visitors explore the geo-park while promoting the areas geology and cultural heritage.

5.1.5: Prioritizing coordinated and planned Geo-Tourism development and management

Thadiq geopark has a number recreational use based on its rich cultural, geological, and natural heritage values. These are exceptional resource values that are highly sought for and appreciated both domestic and international tourists. To achieve long term sustainability of economic benefits from tourism experiences, geo-tourism and other nature-based tourism development should be properly directed and managed in Thadiq Geo-Park.

Several sites within the geo-park landscape have been popular recreation areas for picnickers, campers, desert enthusiasts and nature lovers. There are several opportunities for eco adventure activities, eco style accommodations, eco huts, ecolodges and eco camps. Similarly, attractions such as museums, agricultural markets, restaurants, and cultural heritage sites enhance the range of recreation opportunities within the geo-park.

Experiences that can be developed and enhanced in Thadiq Geo-Park landscape range from geo-tourism services, culture-based hospitality, Agri-tourism based on off-farm and on farm

livelihoods, and conservation (green) enterprises such as beekeeping. Many of these activities could involve private sector investment or joint ventures.

To achieve this, the geo-park management should strive to ensure that tourism development is coordinated, distributed, and upgraded to proper sustainability standards. Adopting a planned and staged approach to developments that will enhance visitor experiences is recommended.

- ❖ First, get the basic infrastructure in place as a priority. This includes roading, carparks, pathways and tracks, basic directional signage, key visitor services such as toilets, prayer rooms, sitting areas and lookouts.
- ❖ Once basic infrastructure is in place move to a program of 'adding value' through initiatives such as interpretive centres; themed trails (vehicle and pedestrian based); commercial operations (tours, attractions, accommodation, services, and events).

5.1.6: Coordinated and Enhanced Research and Monitoring of key values in Thadiq

Research and monitoring is an essential component in the sustainable utilization, preservation, conservation and management of both geological and ecosystem values in the Geo-parks. It involves targeted research activities which include collecting and analysing data to inform and support the management in decision making. Presently, Thadiq Geo-Park management lacks mechanisms and requisite capacity (qualified staff and equipment) to effectively coordinate or undertake research and monitoring activities.

It is, therefore, important that mechanisms are developed to ensure that research and monitoring in Thadiq Geo-Park is well coordinated, accurate data and information is collected and outputs disseminated to both stakeholders and management to support decision making. NCVV will develop or provide research protocols that include guidelines, standards and procedures, issue research permits and closely monitor licensed research activities are in accordance with the approved conditions.

5.2: Management Programmes and Action Plans

The management programmes are broken down in sets of management actions that will be implemented in planned and phased out approaches in various operational plans. The priority management actions are linked with specific activities, key performance indicators (KPIs), responsible actors/partners, and expected timelines of achievement. They will guide and form the basis of more detailed implementation annual work plans. The recommended programme actions plans are highlighted in tables shown in the following sections.

Table 6: Geo-Park Governance and Management programme action plan

Management Action 1: Governance and Management structures and systems are established and strengthened.							
Activities	Verifiable indicators	Time frame					Responsibility
		2024	2025	2026	2027	2028	
1. Establish a clearly defined, streamlined, and functionally effective governance structure with clear vertical reporting and accountability lines.	❖ Legitimate governance structure for the Thadiq Geo-Park						NCVC
2. Establish and make functional a multi-stakeholder governance committee that will be responsible for oversight the Geo-Park and coordination of planned activities	❖ multi-stakeholder committee ❖ Signed Terms of References with clear roles of the Committee ❖ Number of meetings /minutes per year by the committee						NCVC, Head-Saudi Arabia Geo-Parks unit
3. Develop regulations and legislations frameworks that will guide management of the Geo-Park resources and guarantee their long-term sustainability.	❖ Guiding regulations and legislations						NCVC
4. Develop standard operating procedures (SOPs)	❖ Standard Operating Procedures						NCVC
5. Establish systematic, regular, and standard monitoring and reporting system for Geo-Park activities	❖ Monitoring and Reporting system						NCVC
6. Construct Geo-Park office and equip them with essential equipment to support administrative operations.	❖ Office blocks at Thadiq Geo-Park ❖ List of office equipment and furniture						NCVC
7. Procure and maintain vehicles to support administrative operations majorly 4 new offroad station wagons, one tipper lorry for road maintenance and new water bowser.	❖ Offroad station wagon vehicles ❖ Tipper lorry ❖ Water bowser						NCVC

Table 7: Geo-Park Capacity Development Programme Action Plan

Management Action 1: Competent Human Resource Capacity is enhanced and appropriately deployed.							
Activities	Verifiable indicators	Time frame					Responsibility
		2024	2025	2026	2027	2028	
1. Recruit and strategically deploy competent and adequate staff in Thadiq Geo-Park.	❖ No. Staff recruited and deployed in Thadiq Geo-Park						NCVC
2. Train on relevant skills upgrades on geo-heritage and geo-parks management	❖ Number of training Courses, reports, or certificates						NCVC, UNESCO
3. Provide opportunities for staff exchange Programmes to other effectively managed Geo-Parks	❖ Identified Exchange Programmes in effectively managed Geo-Parks						NCVC, Partners
4. Develop collaborative partnerships with other effectively managed Geo-Parks, research and training institutions that would be key in supporting training and capacity development of Thadiq Geo-Park staff.	❖ Institutional Partnerships ❖ Memorandum of Understanding						NCVC Partners
5. Outsource and engage qualified consultants and subject matter experts to provide on job coaching or learnings on short term basis as and when need arises	❖ Register of relevant Experts ❖ Consultancy reports						NCVC
6. Improve staff motivation and teamwork through various team building events and wellness Programmes	❖ Team building events and motivation activities. ❖ Staff wellness Programmes						NCVC
7. Introduce a staff appraisal and performance management systems	❖ Performance Management System ❖ Annual Performance appraisals						NCVC
8. Introduce rewards and recognitions awards that are based on competence and performance.	❖ Rewards and Recognitions based on performance and competence						NCVC

Table 8: Community Engagement and Partnership Programme Action Plan

Management Action 1: Foster collaborative partnerships among key stakeholders to enhance Geo-Park management.							
Activities	Verifiable indicators	Time frame					Responsibility
		2024	2025	2026	2027	2028	
1. Identify mechanisms and strategies that can be used to effectively engage and enhance participation of key stakeholders in Thadiq Geo-Park projects	❖ Stakeholder Engagement Strategy ❖ Stakeholder Participation mechanism						NCVC
2. Proactively engage with MOMRA and other relevant government agencies on Thadiq Geo-Park management	❖ Evidence of engagements						NCVC MOMRA Partners
3. Enhance collaborations and engagements with NGO's, CBOs, and private entities with an interest in Geo-Park	❖ Partnership mechanisms						NCVC NGOs CBOs Partners
4. Identify and develop joint plans, projects or proposals with government entities, NGOs, CBOs on Thadiq Geo-Park development and management.	❖ Joint Programmes and proposals						NCVC NGOs CBOs Partners
Management Action 2: Enhance opportunities for local community participation in Thadiq Geo-Park management and stewardship.							

5. Support local communities in identifying and exploiting nature-based business opportunities.	❖ Report on viable enterprises that are nature-based							NCVC NGOs
6. Support local communities in market analysis and skills upgrades required in the various projects.	❖ Report on Market Analysis and skills upgrades							NCVC NGOs
7. Support the local community groups to acquire requisite business permits & funding for the identified and agreed on enterprises.	❖ Business proposal ❖ Business Permits ❖ Funded enterprises							NCVC MOMRA
8. Prioritize community members within and surrounding Thadiq Geo- Park when awarding contracts	❖ Number of contracts awarded to the local communities							NCVC
9. Identify suitable candidates for both skilled and non-skilled jobs in Thadiq Geo- National Park	❖ Employment opportunities to the local communities							NCVC
10. Train and capacity build locals on geological values preservation, biodiversity conservation, geo-tourism, and other related Geo-heritage management aspects.	❖ List of training courses and capacity building Programmes to the local communities.							NCVC

Table 9: Geo-education and awareness creation programme action plan

Management Action: Education and awareness on the important geological values and other key resources in Thadiq Geo- Park is enhanced							
Activities	Verifiable indicators	Time frame					Responsibility
		2024	2025	2026	2027	2028	
1. Liaise with NCV C and ministry of culture and other relevant stakeholders to develop an outreach Programme that embraces Geo-Parks natural and cultural heritage.	❖ Outreached strategy or Programme						NCVC Ministry of Culture MOMRA
2. Prepare and conduct regular outreach sessions targeted for different stakeholders such as local communities in the villages, NGOs forums and other organized events	❖ Outreach sessions ❖ Meeting reports						NCVC Relevant govt. ministries MOMRA
3. Construct and equip information Centre at Thadiq Geo-Park	❖ Information Centre facility						NCVC
4. Open and maintain media platforms such as Facebook, website Twitter, Pinterest on Thadiq Geo-Park.	❖ social media platforms for Thadiq Geo-Park						NCVC
5. Produce and distribute information materials on the Geo- Park resource values	❖ Information materials						NCVC
6. Prepare documentaries and video scripts on Thadiq Geo-Park	❖ Documentaries and video scripts						NCVC
7. Conduct adverts, talk shows and interviews on the main geological values and opportunities in Thadiq Geo-Park.	❖ Adverts, talk shows and interviews						NCVC

Table 10: Biodiversity conservation and management programme Action plan

Management Action: Protect, rehabilitate, and conserve key habitats to reduce biodiversity loss, improve species and ecosystem recovery							
Activities	Verifiable indicators	Time frame					Responsibility
		2024	2025	2026	2027	2028	
1. Assess and map out changes on heavily degraded habitats that require restoration.	❖ Status of habitat degradation report						NCVC
2. Rehabilitate and restore degraded habitats to improve recovery of both flora and fauna diversity.	❖ Annual habitat Restoration plan						NCVC
3. Establish fenced area within the Geo-Park that can be used for active protection of the and endangered species.	❖ Established fenced areas for active protection						NCVC
4. Identify and map out hunting hotspots in collaboration with key stakeholders.	❖ Map of locations of hunting hotspots						NCVC
5. Undertake soil profile assessment in degraded areas to determine extent of habitat changes and modifications	❖ Soil profile report						NCVC
6. Identify suitable structures and technologies that can reduce soil erosion and improve moisture harvesting	❖ Type of Soil and Water conservation technologies						NCVC
7. Construct soil and water conservation structures in the identified restoration areas to slow down surface run-off and reduce soil erosion.	❖ Number of soil-water conservation structures						NCVC
8. Construct a series of water retention structures along the valley tributaries that feed into the main wadi channels.	❖ Number of water retention structures						NCVC

Table 11: Research and Monitoring Programme

Management Action 1: Coordinate research to generate data and information to support planning and decision making.							
Activities	Verifiable indicators	Time frame					Responsibility
		2024	2025	2026	2027	2028	
1. Design and implement a research and monitoring plan for Thadiq Geo-Park	❖ Research and monitoring plan. ❖ Research reports or papers						NCVC Partners
2. Establish linkages and collaborations with other research institution and experts to strength research activities in Thadiq Geo-Park.	❖ Signed MoUs with research and academic institutions and experts						NCVC, Partners
3. Develop and integrated data and information system or database for Thadiq Geo-Park	❖ Database or Information system						NCVC Partners
4. Conduct research on impacts of key threats to geo-parks values resilience and sustainability	❖ Research reports or papers						NCVC Partners
5. Organize annual conferences or forums to share research information	❖ Annual conferences or forums.						NCVC Partners

Geo-Tourism Development and Management Programme and Action Plan --- (To be adapted from Tony’s document on geo-tourism plan)

Chapter 4: Plan Implementation Strategy

This section outlines the implementation arrangements of this management plan based on the management actions and activities detailed under the four management programmes. The core strategy to this management plan for implementation in the large size of Thadiq Geo-Park is to adopt an ecosystem approach.

Since the recommended management interventions cut across different sectors, there is need for harmonization, integration, collaborative approach, networking, and linkages between key stakeholders on plan implementation to achieve effective results.

To ensure a well-coordinated implementation of the plan, a multidisciplinary implementation committee that brings together key actors responsible for its implementation will be constituted to coordinate and advice on the implementation of the planned activities.

The role of the plan implementation committee (PIC) will be purely advisory, functioning as a sub-committee of Thadiq Geo-Park. It will not override or substitute the NCVC and Thadiq Geo-Park management team, nor have any responsibility of carrying out specific actions described in this plan. Therefore, the specific roles of the plan implementation committee will be;

- ❖ Coordinate the implementation of the management plan.
- ❖ Mobilize resources for implementation of planned activities.
- ❖ Monitor and evaluate progress of planned activities.
- ❖ Identify constraints and challenges on the implementation of the planned activities.
- ❖ Produce annual progress reports on plan implementation.
- ❖ Recommend review of the management plan; and
- ❖ Oversee the implementation of the plan.

The plan implementation structure is illustrated in figure 16, while table 11 provides the roles and responsibilities of different standing committees. *Ad hoc* committees can be formed as and when need arises.

Figure 16: Proposed management plan implementation structure.

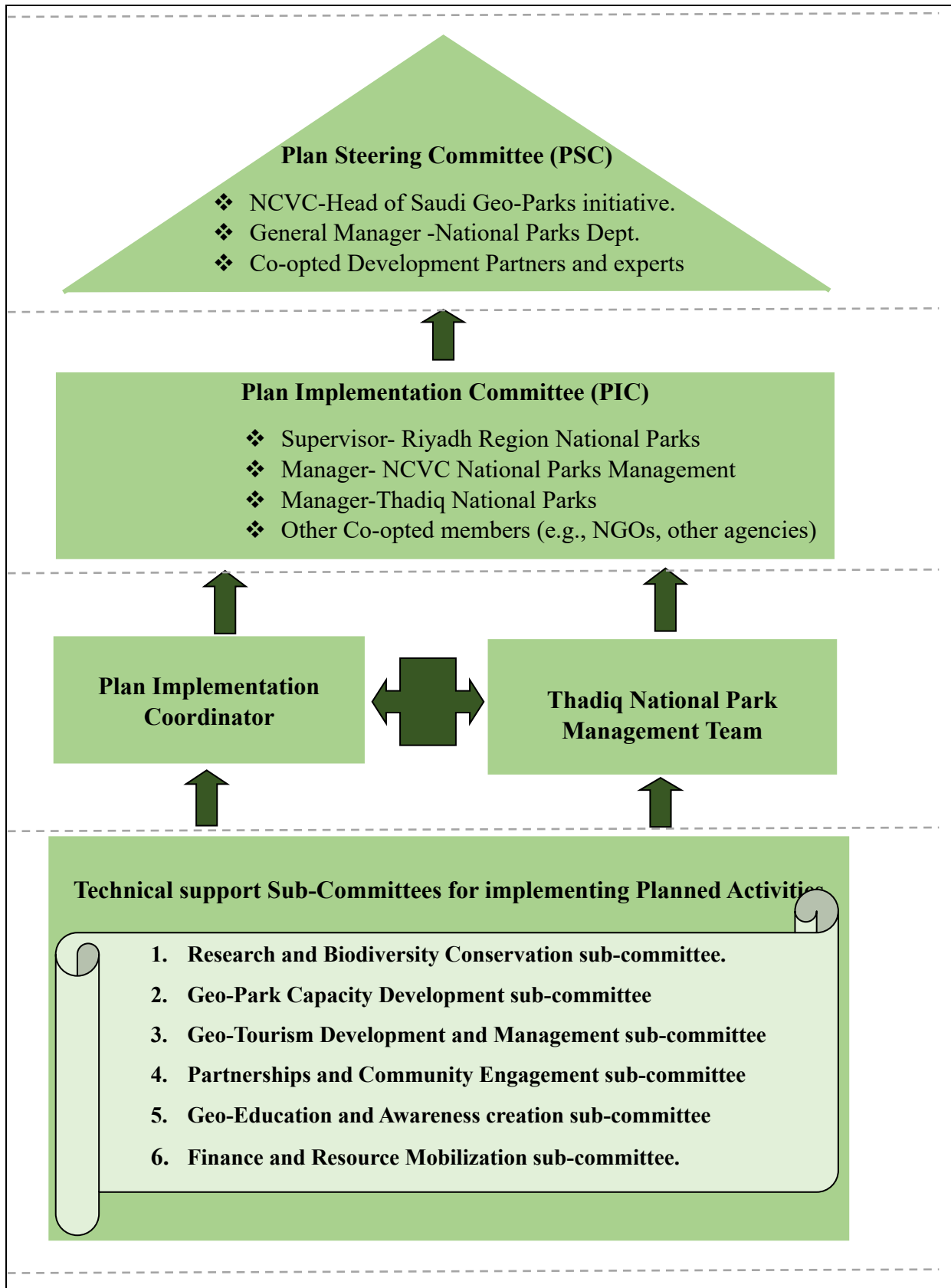


Table 12: Proposed roles and responsibilities of the implementation committees

Implementation Committee level	Roles and Responsibilities
Plan Steering Committee (PSC)	<ul style="list-style-type: none"> • Policy directions • Approval of action plans drawn from the plan • Mobilize resources for plan implementation. • Allocate funds to facilitate plan implementation and coordination.
Plan Implementation Committee (PIC)	<ul style="list-style-type: none"> • Coordinate plan implementation. • Monitor and evaluate plan implementation. • Identify challenges of plan implementation • Produce progress reports on plan implementation. • Recommend review of the management plan
Plan Implementation Coordinator	<ul style="list-style-type: none"> • Coordinate implementation of planned activities • Plan monitoring and evaluation. • Develop annual work plans and budgets. • Brief PSC and PIC committee on plan progress
Thadiq National Park Senior Management Team	<ul style="list-style-type: none"> • Coordinate specific management programmes and actions at the Geo-Park sites. • Coordination and the preparation of Thadiq Geo-Park progress reports • Coordinate annual work plans and budgets for the implementation of planned activities. • Convening plan PSC and PIC meetings
Focal Area Technical Support Sub-Committees	
Research and Biodiversity Conservation and Management Sub-Committee	<ul style="list-style-type: none"> • Conducts monitoring and produce status reports on ecological trends in the ecosystem. • Conducts research and surveys on areas identified by the plan. • Collect and maintain environmental data in area. • Interpret and disseminate scientific information and new technologies. • Biodiversity conservation and Natural Resource management within Thadiq Geo-Park.
Geo-Education and Awareness Creation sub- Committee	<ul style="list-style-type: none"> • Coordinate education and awareness creation on Thadiq Geo-Park values programme. • Develop education and awareness materials for different stakeholder groups. • Organize meetings with community members to sensitize them on preservation of geological resources and environmental conservation. • Organise for participation in celebrations on international natural and geology related events.

	<ul style="list-style-type: none"> • Organize relevant education and awareness tours.
Partnerships and Community Engagement sub-Committee	<ul style="list-style-type: none"> • Identify key groups for engagement and develop networks. • Identify and initiate dialogue with other partners such as local NGO groups etc. • Identify income generating projects in the area that are compliant with environmental standards. • Monitor success of the enterprise projects in the area • Develop mechanisms for benefit sharing of the conservation enterprise projects in area.
Geo-Tourism Development and Management	<ul style="list-style-type: none"> • Advice NCVC and the Geo-Park management on geo-tourism and other recreation and nature-based investments in Thadiq Geo-Park. • Develop nature-based tourism related standards for investments in Thadiq Geo-Park. • Develop marketing strategy for Thadiq Geo-Park
Resource Mobilization committee	<ul style="list-style-type: none"> • Assist in developing budget forecasts. • Mobilize resource to support the implementation of planned activities. • Advice on mechanisms to harmonize resource utilization with a view to optimize resource use. • Advice on the prepared annual financial reports

Plan Annexes

Annex 1: Summary of Stakeholder Identification, Mapping and Prioritization Analysis

Stakeholder Name	Stakeholder Profile	Stakeholder Mandate	Potential role or interest in the North Riyadh Geo-Park	Impact/influence on Geo-Park Programs and activities	Level and Technique of engagement
Ministry of Environment, Water & Agriculture (MoEWA) - Environment Agency	Government	<ul style="list-style-type: none"> Protection, conservation, and management of KSA environment. 	<ul style="list-style-type: none"> Influence development and approval of policies, executive plans, and regulations for National Parks. Coordinate with MoEWA branches in the regions to ensure smooth operation of National Parks at field level. Provide support for coordination with key stakeholders both at the National and regional levels. Arrangement of any contractual agreement for the development and management of National Parks 	<ul style="list-style-type: none"> Influence: High Impact: High 	<ul style="list-style-type: none"> Inform: Fact sheets, Survey reports, websites, workshops
				<ul style="list-style-type: none"> Consult: Consultative interviews, meetings, workshops, and focus group discussions Involve: focus group discussions and workshops advisory committees Collaborate: Advisory committees, validation workshops 	
National Centre for the Development of Vegetation Cover and Combating Desertification (NCVC)	Government	<ul style="list-style-type: none"> Overseeing plans and implementation mechanisms proposed on biodiversity, forests, rangeland, national parks, and combating desertification. 	<ul style="list-style-type: none"> Reviewing policies, legislations, rules, strategies, and regulatory frameworks related National Parks and Geo-Parks Provide linkages with the regional offices, other key partners, and local communities in the fields. Contribute to the development and sustainable management of Geo-Parks and National Parks. Ensuring that financial and human resources are allocated timely. Arrangement of any contractual agreement for the development, investments, and management of activities within the geo-park 	<ul style="list-style-type: none"> Influence: High Impact: High 	<ul style="list-style-type: none"> Inform: Fact sheets, Survey reports, websites, workshops Consult: Consultative interviews, meetings, workshops, and focus group discussions Involve: focus group discussions and workshops advisory committees Collaborate: Advisory committees, validation workshops
Department of National Parks	Government	<ul style="list-style-type: none"> Supervising, managing and development of National Parks 	<ul style="list-style-type: none"> Reviewing and ensuring effectiveness and suitability of programs and procedures for 	<ul style="list-style-type: none"> Influence: High Impact: High 	<ul style="list-style-type: none"> Inform: Fact sheets, Survey reports, websites, workshops

			<p>the implementation of strategies and plans related to national parks and Geo-Parks</p> <ul style="list-style-type: none"> • Reviewing the studies and research on national parks and Geo-Parks • Overseeing procedures for protecting, monitoring, and developing national parks and geo-park areas, as well as sustainable environmental management, and investment opportunities to support the ecotourism. • Reviewing the mechanisms for identifying and pursuing privatization and investment opportunities in the geo-parks and national park areas. • Identification and coordination of nature-based tourism products and services in the geo-park areas. • Dissemination of accurate and updated information on the National Park and Geo-Park areas. • Marketing and promotion of North Riyadh (Thadiq) Geo- Park. • Setting up specifications, rules and regulations for ecotourism development in the Geo-Park 		<ul style="list-style-type: none"> • Consult: Consultative interviews, meetings, workshops, and focus group discussions • Involve: focus group discussions and workshops advisory committees • Collaborate: Advisory committees, validation workshops and meetings
Thadiq National Park Management team	Government	<ul style="list-style-type: none"> • Coordination and ensuring implementation of activities in the National Parks in Thadiq Governorate 	<ul style="list-style-type: none"> • Operationalizing the Management of National Parks and Geo-Park in Thadiq • Ensuring the security of visitors and facilities in the parks • Proper interpretation of park rules and regulations. • Identification of products and services within the field National Parks and Geo-Park sites in their regions. • Publicity and awareness on the Geo-Park sites to the local communities 	<ul style="list-style-type: none"> • Influence: High • Impact: High 	<ul style="list-style-type: none"> • Inform: Fact sheets, Survey reports, websites, workshops • Consult: Consultative interviews, meetings, workshops, and focus group discussions • Involve: focus group discussions and workshops advisory committees • Collaborate: Advisory committees, validation workshops

					<ul style="list-style-type: none"> • Involve: focus group discussions and workshops advisory committees
Thadiq Governorate (Emarah)	Government	<ul style="list-style-type: none"> • Administrative leadership in Thadiq Governorates 	<ul style="list-style-type: none"> • Provide political support in the development Programs in the Thadiq Geo-Park and National Parks • Ensure that the Thadiq Geo-Park development projects align with the regional priorities 	<ul style="list-style-type: none"> • Influence: High 	<ul style="list-style-type: none"> • Consult: Consultative interviews, meetings, workshops, and focus group discussions • Involve: focus group discussions and workshops advisory committees • Inform: Fact sheets, Survey reports, websites, workshops
				<ul style="list-style-type: none"> • Impact: High 	
Ministry of Municipal and Rural Affairs (MOMRA)	Government	<ul style="list-style-type: none"> • oversight and regulation of municipalities developments across the country's cities, towns, and villages. 	<ul style="list-style-type: none"> • Ensure Thadiq geo-Park development projects align with the municipality rules and regulations. • Support conservation and preservation of natural and cultural heritage values in Thadiq Geo-Park. • Support in promotion of Thadiq Geo-Park products and services 	<ul style="list-style-type: none"> • Influence: High 	<ul style="list-style-type: none"> • Consult: Consultative interviews, meetings, workshops, and focus group discussions • Involve: focus group discussions and workshops advisory committees • Inform: Fact sheets, Survey reports, websites, workshops
				<ul style="list-style-type: none"> • Impact: High 	
National Centre for Wildlife (NCW)	Government	<ul style="list-style-type: none"> • Manage and supervise the protection and conservation of wildlife in KSA. • Planning and managing KSA's Protected Areas • Managing centers for breeding and resettlement of the endangered wildlife species in the Kingdom. 	<ul style="list-style-type: none"> • Contributing to the conservation and development of nature-based tourism activities in the Geo-Park. 	<ul style="list-style-type: none"> • Influence: High 	<ul style="list-style-type: none"> • Consult: Consultative interviews, meetings, workshops, and focus group discussions • Collaborate: Advisory committees, validation workshops
				<ul style="list-style-type: none"> • Impact: Low 	
	Royal Reserves and Sanctuaries	<ul style="list-style-type: none"> • The reserves aim to manage its natural and 		<ul style="list-style-type: none"> • Influence: High • Impact: Low 	

Imam Abdulaziz Bin Mohammed Royal Reserve		cultural heritage while promoting sustainable tourism and conservation.	<ul style="list-style-type: none"> Contribute to the conservation natural and cultural heritage in geo-park and its diverse ecosystem. Support in promoting sustainable tourism and raise awareness on the importance of conservation and preservation of geological heritage. 		<ul style="list-style-type: none"> Collaborate: Advisory committees, validation workshops Consult: Consultative interviews, meetings, workshops, and focus group discussions
King Khalid Royal Reserve					
Saudi Commission for Tourism and National Heritage	Government	<ul style="list-style-type: none"> Managing, development, and promotion of the Tourism Sector in the Kingdom 	<ul style="list-style-type: none"> Licensing tourism ventures and promotion of ecotourism opportunities in Geo-Park areas through exhibitions and other forums. Publicity and tourism awareness promotion programs on Thadiq Geo-Park 	<ul style="list-style-type: none"> Influence: High 	<ul style="list-style-type: none"> Consult: Consultative interviews, meetings, workshops, and focus group discussions
				<ul style="list-style-type: none"> Impact: Low 	
Saudi Geological Survey	Government	<ul style="list-style-type: none"> Manages the geological surveys and earth surface explorations in Saudi Arabia 	<ul style="list-style-type: none"> Protecting and preserving geological sites and caves that might be of tourism potential 	<ul style="list-style-type: none"> Influence: High 	<ul style="list-style-type: none"> Consult: Consultative interviews, meetings, workshops, and focus group discussions Involve: focus group discussions and workshops advisory committees Collaborate: Advisory committees, validation workshops Inform: Fact sheets, Survey reports, websites, workshops
				<ul style="list-style-type: none"> Impact: High 	
King Abdulaziz University,	Research and Academic institutions	<ul style="list-style-type: none"> Research and Training 	<ul style="list-style-type: none"> Collaboration in research and trainings in conservation, geological and tourism related areas in Thadiq Geo-Park Capacity building and human personnel development in Thadiq Geo-Park Interpretation and dissemination of research reports findings and materials 	<ul style="list-style-type: none"> Influence: Low 	<ul style="list-style-type: none"> Consult: Consultative interviews, meetings, workshops, and focus group discussions Collaborate: Advisory committees, validation workshops
King Saud University				<ul style="list-style-type: none"> Impact: Low 	
Shaqra University					

King AbdulAziz City for Science and Technology (KACST)- Natural Resources and Environmental Research Center.			<ul style="list-style-type: none"> Awareness creation on the benefits of conservation of the natural and cultural resources 		
Saudi Environmental Society,	Environmental NGOs and society	<ul style="list-style-type: none"> Voluntary associations that seek to contribute to the raising the level of environmental awareness in the society. 	<ul style="list-style-type: none"> Support the protection and conservation of Thadiq Geo-Park environment. Collaborate with NCV and other agencies on tree planting and other initiatives aimed at combating desertification at the geo-park. of Geo- Park awareness raising campaigns. Contribute to capacity building interventions and awareness raising campaigns for Thadiq Geo-Park 	<ul style="list-style-type: none"> Influence: High 	<ul style="list-style-type: none"> Inform: Fact sheets, Survey reports, websites, workshops
Saudi Geographical Society				<ul style="list-style-type: none"> Impact: Low 	<ul style="list-style-type: none"> Involve: focus group discussions and workshops advisory committees
Environment and Combating Desertification Association in Saudi Arabia (ECD)				<ul style="list-style-type: none"> Collaborate: Advisory committees, validation workshops 	
Environmental Development Association (Faseel)					
Green Horizons Environmental Association					
Green Sweet Association (Helwa Green)					
Saudi Arabian Botanical Society		Botanical society in Saudi Arabia with an aim of preserving native and endemic species and establishment of botanical gardens.			
Ghamra tourism company	Tour operators and guides	<ul style="list-style-type: none"> Recreational, geotourism and ecotourism services and investments. 	<ul style="list-style-type: none"> Study opportunities for investments in Thadiq Geo-Park sites. Promotion of ecotourism and geo-tourism products and services Marketing of the Thadiq Geo-Park products and services Disseminate updated and reliable information. 	<ul style="list-style-type: none"> Influence: High 	<ul style="list-style-type: none"> Inform: Fact sheets, Survey reports, websites, workshops
DARB Saudi Hiking Trails Association				<ul style="list-style-type: none"> Impact: High 	
					<ul style="list-style-type: none"> Collaborate: Advisory committees, validation workshops

					<ul style="list-style-type: none"> • Consult: Consultative interviews, meetings, workshops, and focus group discussions
Food and Agriculture Organisation of the United Nations (FAO) The United Nations Educational, Scientific and Cultural Organization (UNESCO)	International Organizations (Specialized agencies)	<ul style="list-style-type: none"> • They are specialized agencies that provide technical advisory support on activities that improve knowledge uptake, technologies, and good practices in conservation and development domains. 	<ul style="list-style-type: none"> • Support dialogue, technical and advisory support on conservation, protection development of Geo-Parks and sites. • Improvement in the technical standards and knowledge exchange • Influence improvement of access to data and information 	<ul style="list-style-type: none"> • Influence: High 	<ul style="list-style-type: none"> • Inform: Fact sheets, Survey reports, websites, workshops
				<ul style="list-style-type: none"> • Impact: High 	
The International Union for Conservation of Nature (IUCN).				<ul style="list-style-type: none"> • Consult: Consultative interviews, meetings, workshops, and focus group discussions • Involve: focus group discussions and workshops advisory committees 	
The United Nations Environment Programme (UNEP)					<ul style="list-style-type: none"> • Collaborate: Advisory committees, validation workshops
United Nations Development Programme (UNDP)					
Tourists	Park visitors	<ul style="list-style-type: none"> • National Park Customers 	<ul style="list-style-type: none"> • Customers in the National Park sites • Ecotourism product appreciation and promotion by word to friends, family, and the public 	<ul style="list-style-type: none"> • Influence: High • Impact: High 	<ul style="list-style-type: none"> • Inform: Fact sheets, Survey reports, websites, workshops • Involve: focus group discussions and workshops advisory committees
Local community members	General Public	<ul style="list-style-type: none"> • National Park adjacent Populations 	<ul style="list-style-type: none"> • Partnerships and Support for ecotourism and geo-tourism ventures in the Geo-Park sites • Adoption of land use practices compatible with conservation and ecotourism activities • Positive attitude towards conservation and geo-tourism 	<ul style="list-style-type: none"> • Influence: High 	<ul style="list-style-type: none"> • Inform: Fact sheets, Survey reports, websites, workshops
Landowners within and adjacent Thadiq geo-park boundary				<ul style="list-style-type: none"> • Impact: High 	
Local community-based organisations				<ul style="list-style-type: none"> • Involve: focus group discussions, workshops advisory committees 	

Local leaders			<ul style="list-style-type: none"> • Provide for labour in put that may be required at the Geo-Park sites from time to time 		<ul style="list-style-type: none"> • Consult: Consultative interviews, meetings, workshops, and focus group discussions • Collaborate: Advisory committees, validation workshops, consensus building activities • Empower: citizen meetings, partnerships, economic and social empowerment,
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Annex 2: Core Planning Team

Name	Role in Plan Development	Organisation affiliation
1. Steve Kamerino	Lead the management Plan development and authorship	FAO-National Park Planning and Development Consultant
2. Antony Charters	Geo-tourism and investment analysis and Master Plan	NCVC- Senior Ecotourism Advisor
3. Gabriel Sanya	Mapping and analysis	FAO-GIS support
4. Nabeel Boudi	Assisted the planning team to understand clearly the local socio-cultural perspectives.	FAO-National Professional Officer in National Parks Component
5. Abdulla Al Eissa	National Park information on key features, challenges, and issues.	Manager -Thadiq National Park (NCVC)
6. Osama Al Eissa	Guide both within Thadiq Geo-Park and adjacent local community areas.	Staff Thadiq National Park (NCVC)
7. Éric Lacroix	Final édition.	FAO Technical Adviser, National Parks

Annex 3: Summary of Biodiversity at North Riyadh Geo-Park

متنزه ثادق الوطني

الاشجار :

- ١- الطلح النجدي .
- ٢- الطلح الرديانا .
- ٣- الطلح العراقي .
- ٤- السلم .
- ٥- الهجليج .
- ٦- السدر الجبلي .
- ٧- السدر البري .
- ٨- الوهط .
- ٩- الهشاب (الصمغ العربي) .
- ١٠- بان عربي (اليسر) .
- ١١- الحور الفراتي .
- ١٢- التين البري .
- ١٣- اللصف .
- ١٤- المرخ .
- ١٥- الغظا .
- ١٦- الرطى .
- ١٧- الجميز .
- ١٨- التنظب .
- ١٩- الكثر .
- ٢٠- السيال الاخضر .
- ٢١- السيال الاحمر .
- ٢٢- الرتم .
- ٢٣- العرن .
- ٢٤- الغاف .
- ٢٥- الفرفار .
- ٢٦- العوشق .
- ٢٧- العوشق القرصي .
- ٢٨- العلندا .
- ٢٩- الثمام (١- القصبا ٢- الضعه ٣- العريجا) .
- ٣٠- العرفج .
- ٣١- الحنظل (الشري) .
- ٣٢- القتاد .
- ٣٣- اصابع العروس .
- ٣٤- الشبرم .
- ٣٥- الرمرام .
- ٣٦- النصي .
- ٣٧- الشيخ .
- ٣٨- السمر .
- ٣٩- العبيثران .
- ٤٠- القيصوم .
- ٤١- العهين .
- ٤٢- القطين .
- ٤٣- الذنبان .
- ٤٤- الحرمل .

- ٤٥- الرمث .
- ٤٦- التنوم .
- ٤٧- القرص .
- ٤٨- الحماما .
- ٤٩- الرخيما .
- ٥٠- القرنوه .
- ٥١- السواس .
- ٥٢- الايبد .
- ٥٣- العجرم .
- ٥٤- الشنان .
- ٥٥- الظمران .
- ٥٦- الينبوت .
- ٥٧- الحميظ .
- ٥٨- الحوذان .
- ٥٩- البقرا .
- ٦٠- البسباس .
- ٦١- الذعلوق .
- ٦٢- الحوا .
- ٦٣- اليهق .
- ٦٤- الممكنان .
- ٦٥- النفل .
- ٦٦- حوذان .
- ٦٧- النقيب .
- ٦٨- الارقه .
- ٦٩- الربله .
- ٧٠- القريطا .
- ٧١- الحرف .
- ٧٢- الخطمي .
- ٧٣- السعدان .
- ٧٤- المكر .
- ٧٥- القرقاص .
- ٧٦- الحندقوق .
- ٧٨- الحنوه .
- ٧٩- القلقلان .
- ٨٠- الحاذ .
- ٨١- الحمحم .
- ٨٢- النقد .
- ٨٣- الكري .
- ٨٤- المرار .
- ٨٥- الشوفان البري .
- ٨٦- الثيل .
- ٨٧- العجله .
- ٨٨- الحماري .
- ٨٩- الصخير .
- ٩٠- الجميم .
- ٩١- العاقول .
- ٩٢- القفعا (كف مريم) .
- ٩٣- العتر .

- ٩٤- الغلقه .
٩٥- الهراس .
٩٦- القطب .
٩٧- الزهر .
٩٨- الجعد .
٩٩- السبط .
١٠٠- الحمباز .
انواع الطيور والحيوانات
١- الذيب .
٢- الثعلب .
٣- الضيع .
٤- النيص .
٥- الضرمبول .
٦- الكلب .
٧- القط البري .
٨- التفه .
٩- الضب .
١٠- القنفذ .
١١- الجربوع .
١٢- الجرذي .
١٣- الفار .
١٤- الثعابين .
١٥- الغزال .
١٦- الارنب .
١٧- الوبر .
١٨- العقارب .
١٩- طيور الحجل .
٢٠- حمام الخضاري .
٢١- حمام القوقسي .
٢٢- العصفور .
٢٣- البلبل .
٢٤- الهدهد .
٢٥- ام سويد .
٢٦- ام سالم .
٢٧- القوبع .
٢٨- الحمر .
٢٩- الشوله .
٣٠- عصفور الطلح .
٣١- الغراب .
٣٢- السرد .
٣٣- الباشق .
٣٤- الرخم .
٣٥- الصقر .
٣٦- النسر .