وزارة الشـــؤون
البلدية و القروية
Ministry of Municipal & Rural Affairs

URBAN LANDSCAPES INTEGRATION

AL-AHSA: AN URBAN CULTURAL OASIS

مستقبل المدن السعودية
FUTURE SAUDI CITIES

UN HABITAT
FOR A BETTER URBAN FUTURE

Future Saudi Cities Programme
Demonstration Project: **Al-Ahsa**

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URBAN LANDSCAPES INTEGRATION

AL-AHSA: AN URBAN CULTURAL OASIS

FUTURE SAUDI CITIES PROGRAMME

DEMONSTRATION PROJECT

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"The association between the large watered date palm groves and the urban environment creates an exceptional cultural landscape presenting, through its continuous practice, a unique evolution of an ancient cultural tradition bearing testimony to the sedentary human occupation of the area throughout the millennia and to its evolving sustainability until the present day"

Saudi Commission for Tourism and National Heritage

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1 INTRODUCTION

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1.1 The Scope of the Demonstration Project

UN-Habitat's three-pronged approach considers spatial planning in relation to legal and institutional frameworks, in addition to financial mechanisms. In this way, success criteria for the sustainable implementation of a spatial plan should include flexible but enforceable rules and regulations, in addition to a financing strategy and projections.

As a pragmatic explication of this approach, three local demonstration projects representing essential elements of a strengthened and improved planning system have been developed. As applicable to all of these projects, the demonstration project for Al-Ahsa has been elaborated to include schematic designs and feasibility studies, that can later be transformed into implementation plans. Such implementation plans are projected to be undertaken by The Ministry of Municipal and Rural Affairs (MoMRA), in collaboration with other partners in the Kingdom. Though this project is localised in order to provide a detailed and calculated projection of impact, it has been designed to address problems that have been analysed as emblematic of Saudi Cities, and the themes and elemental compositions presented here, are considered as transposable to the larger Saudi context.

This demonstration project addresses themes such as public space creation, pedestrian and green connectivity, cultural and heritage integration. It places the cultural identity of the Al-Ahsa Oasis at the centre of the urban experience, creating physical links to the oasis infrastructure and enhancing the symbiotic connections between the natural and engineered ecosystems. This plan draws from a detailed analysis of Al-Ahsa's strengths and weaknesses and intends to enhance the city's natural features and to bring renewed importance to existing landmarks through new connections. Al-Ahsa's urban form is completely isolated from the agricultural heritage of the oasis and redressing this isolation forms the basis of this proposal. However, despite the specificity of this proposal, these themes are paradigmatic of many cities in the Kingdom and therefore, the modes of address for these themes are intended equally as a toolkit of approaches that can be re-contextualised and applied to many more areas in the Kingdom, under their own specific circumstances.

The projects closely follow criteria and ideologies put forward by UN-Habitat in the New Urban Agenda. The following articles have particular relevance to this proposal:

Article 37. We commit ourselves to promoting safe, inclusive, accessible, green and quality public spaces, including streets, sidewalks and cycling lanes, squares, waterfront areas, gardens and parks, that are multifunctional areas for social interaction and inclusion, human health and well-being, economic exchange and cultural expression and dialogue among a wide diversity of people and cultures, and that are designed and managed to ensure human development and build peaceful, inclusive and participatory societies, as well as to promote living together, connectivity and social inclusion.

Article 38. We commit ourselves to the sustainable leveraging of natural and cultural heritage, both tangible and intangible, in cities and human settlements, as appropriate, through integrated urban and territorial policies and adequate investments at the national, subnational and local levels, to safeguard and promote cultural infrastructures and sites, museums, indigenous cultures and languages, as well as traditional knowledge and the arts, highlighting the role that these play in rehabilitating and revitalizing urban areas and in strengthening social participation and the exercise of citizenship.

1.2 Objectives of the Demonstration Project

This project aims to integrate the green and blue networks of the agricultural fields in the oasis with the historic urban centre of Al-Ahsa. It is proposed that this approach will impress a unique identity on the city, while inculcating awareness and respect for the natural systems which are fundamental to the creation and sustained success of the settlement. This proposal leverages existing pedestrian infrastructure, key historic landmarks and vacant spaces in the city centre to create a public realm, interweaving the historic fabric of the city with the water supply and drainage network. The new public realm is programmed to accommodate several new facilities, functioning as a dynamic walking exhibit of the city and its rich cultural history.

Through this intervention, the project aims to achieve:

- Green-blue network integration with the built-up area
- Restructured and inclusive pedestrian network and public spaces
- Consolidated and redefined urban fabric
- Historic / cultural integration
- Inter-modal mobility
- Safe, healthy and diverse neighbourhoods
- Vibrant street life

Fig. 1. Concept sketch of the project proposal

LINKAGE TO THE STRATEGIC VISION FOR AL-AHSA

2

2.1 The Strategic Vision for Al-Ahsa

Al-Ahsa is situated in the Eastern Region of the Kingdom of Saudi Arabia which is home to 15% of the total Saudi population. Al-Ahsa currently has a population of 1,240,000 on a built area of 22,600 hectares. The city of Al-Ahsa is a congregate of multiple villages, the largest being Al Hofuf and Al Mubarraz, that form the metropolitan part of the city. It is one of the oldest settlements in the world. The Al-Ahsa Oasis has been declared a UNESCO World Heritage Site, as a cultural landscape that has successfully integrated natural ecosystems, biodiversity and human settlements. The Demonstration project for Al-Ahsa focuses heavily on its unique history and ecology and explores a series of interventions in Al Hofuf. As stated above, Al hofuf is one of the largest original villages of the Al-Ahsa conurbation and is home to a number of important heritage sites.

Developed as an extension of the Al-Ahsa City Profile, this project taps into the Strategic Vision for Al-Ahsa, which outlines a series of high-level strategic recommendations for the radical restructuring of the city's future development patterns. As such, this project will provide an example of concrete interpretations that bring conceptual strategies and actions into design guidelines and implementable projects. Below presents a summary of the three strategic recommendations from the Al-Ahsa City Profile, in relation to the demonstration project.

2.1.1 The Compact City

The Compact City is envisioned as a high-density urban settlement, characterised by mixed-use development, recognisable, densely populated and revitalised central areas, with well-distributed services and facilities, (hospitals, parks, schools, leisure, and entertainment). This concept asserts that the shape and the density of cities have implications for the sustainable use of resources. The compact city is achieved by prioritising urban renewal, planning for the provision of accessible and well-connected infrastructure and services with sustainable population densities. It is also necessary to consider integration of new neighbourhoods within the existing urban fabric, in order to prevent sprawl and marginalisation. The demonstration project utilises the following approaches that target the provisions of a Compact City:

- It proposes a series of mechanisms to consolidate the urban footprint with improved connectivity across mass transit, pedestrian access, evenly distributed services and public space.
- It proposes infill of currently available vacant land with mixed-use and dense development.
- The proposal aims to contain urban sprawl by densifying selected areas of the urban footprint.

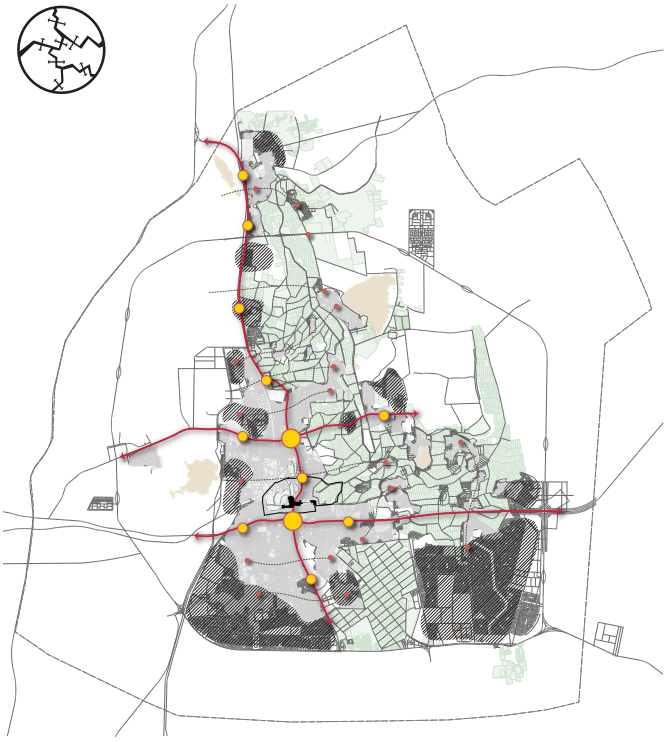

Fig. 3. The Connected City

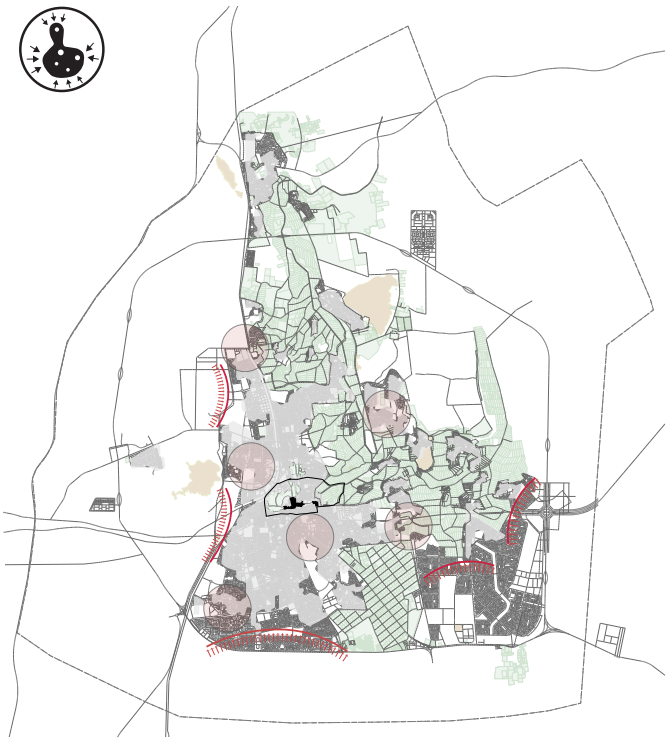

Fig. 2. The Compact City

2.1.2 The Connected City

The Connected City is envisaged as a continuous, well-connected, and well-balanced network of neighbourhoods, each with parks and public spaces, and accommodating a diversity of overlapping private and public activities, shaping a healthy and vital urban environment. A well-organised street hierarchy with arterial routes and local streets, based on different modes of transport and traffic speeds has a major role in shaping the urban structure which, in turn, sets the development patterns and scales for blocks, connective nodes, buildings, open spaces, and landscape. Mass transit systems can provide high-speed, cross-town travel, leaving local distribution to local systems and foot traffic. This opens further opportunities to concentrate mixed-use developments around public transport interchanges which reduces the volume of traffic, positively impacting congestion and pollution. In line with the above, the demonstration project presents a series of interventions that contribute to an improved pedestrian network for Al-Ahsa:

- The proposal connects important historical sites, and public plazas through pedestrian links in the centre of Al hofuf
- The proposal creates a crucial transversal east-west connection, linking the urban form to the agricultural fields in the oasis

2.1.3 The Resilient City

A Resilient City takes into consideration appropriate built form and physical infrastructure to increase resilience to the physical, social, and economic challenges that arise from depleting carbon-based fuels and climate change. According to the New Urban Agenda (NUA), cities need to ensure environmental sustainability by promoting clean energy and sustainable use of land and resources, protecting ecosystems and biodiversity, promoting sustainable consumption and production patterns, reducing disaster risks, as well as mitigating and adapting to climate change. In Al-Ahsa, the demonstration project considers this recommendation centrally and exemplifies strategies to fully capitalise on the city's unique features in a way that will create a symbiotic relationship between the built and natural environment as follows:

- The integration of the waterways will improve the city's ecological health and provide opportunity to connect and harmonise the natural green and blue networks with the urban fabric.
- The development of a green link through the city centre will add to the city's green network in a way that opens opportunity to connect the historical sites in the city. Additional sites for infill interventions are strategically identified in areas of vacant land to create a seamless network of green spaces that can provide equal access to all residents.
- The placement and design of the pedestrian links and public spaces will be complemented by extended water connection system. Additionally, the water connection could be developed to form a closed loop, through which natural filtration can be introduced to recycle drainage water.

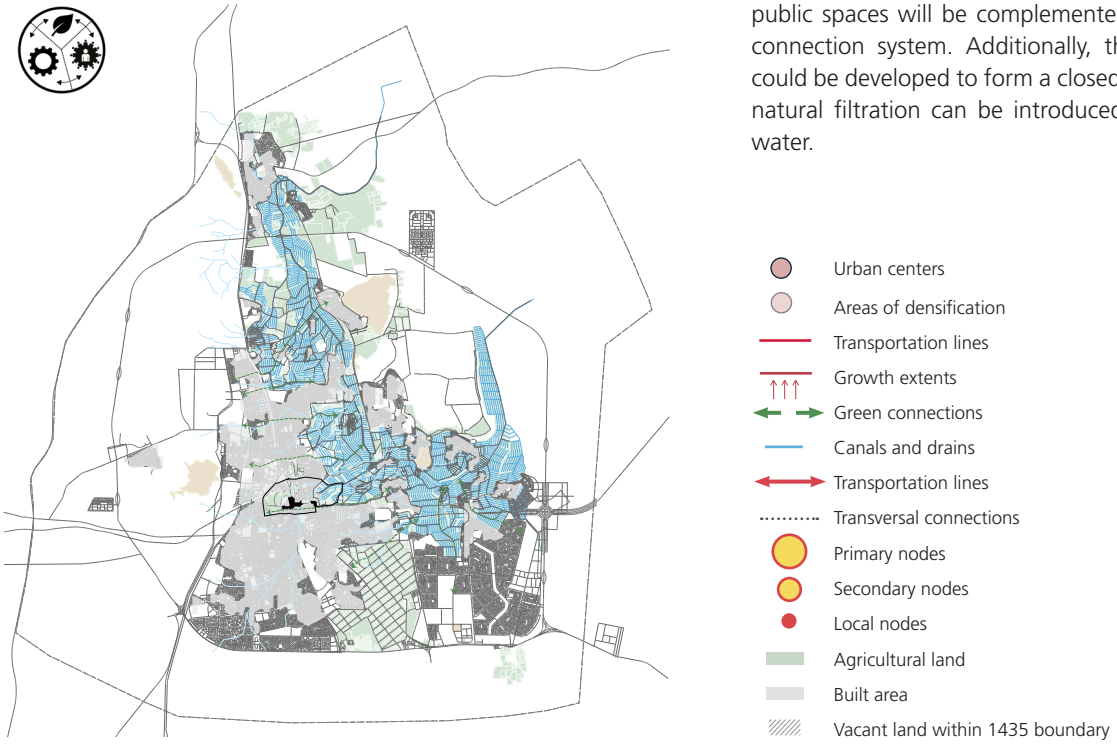

Fig. 4. The Resilient City

Fig. 5. Three strategic responses for Al-Ahsa

Interior of Qaisariah Souq

2.2 Implementing the Vision: An Action Plan for Al-Ahsa

As outlined in the Al-Ahsa City Profile, the city diagnosis was interpreted to form a series of strategic recommendations that defined the conceptual framing for a systemic and strategic address to the issues affecting urban development in Al-Ahsa. These were followed by an Action Plan, which, in the case of Al-Ahsa, is formed of three systemic actions that service implementation of the strategic vision. The demonstration project interprets those systemic actions into a series of specific interventions focused on linking the oasis to the historic city centre.

Although the demonstration project focuses heavily on Action 3, it incorporates recommendations for restructuring amenities close to public transport and encourages mixed-use development and higher densities in the urban core. The following addresses the interpretation of each specific Action in relation to the demonstration project.

2.2.1 Action 1 - Establish an extensive public transport system to support the creation of new corridors

Action 1 focuses on the city's need for a restructured mobility network that takes into account its street networks, services distribution, and new transportation modes. Action 1 is interpreted as a radical proposal for a new transport system, guided by a phased implementation plan. The demonstration project focuses on integrating pedestrian networks with the main transit lines, with stops located near the city centre of Al Hofuf. This will trigger a series of networked interventions, focusing new facilities, amenities, and density in the functional core of the city. The project leverages the central location of the heritage buildings to enhance its importance as the city core by creating transversal links to the oasis and integrating pedestrian networks.

2.2.2 Action 2 - Implement strategic densification around main nodes and transport lines

Action 2 suggests incremental densification supported by new hubs focused around major transport nodes. The demonstration project assesses the potential to densify areas within the historic fabric, which can appear to be dense but remains unconsolidated, retaining interstitial vacant spaces between existing parcels. There is also considerable vacant land around the intervention site that can be redeveloped to accommodate a mix of uses such as housing, commercial spaces, public facilities etc., depending on location and need following careful assessment. With an improved connectivity generated by the creation of new public spaces and enhanced streetscapes, the land values of adjacent properties will increase and dependence on personal vehicles will be reduced.

Fig. 6. Action 3: Relink natural elements to the city and establish a well-integrated green and public space network

2.2.3 Action 3 - Relink natural elements to the city and establish a well-integrated green and public space network

Action 3 addresses the city's natural elements to create an environment that is more resilient, more sustainable and enjoyable for its residents. The oasis is a UNESCO World Heritage Site and an integral part of Al-Ahsa's identity, however, it remains completely disconnected from the urban fabric, acting instead as an impediment to the continuity of the settlement pattern. The agricultural fields should be integrated with the city fabric. This can be achieved through the extension and adaptation of the water channels that service the agricultural sites. These channels can be augmented to function additionally as pedestrian transportation connections or green spaces. These connections should serve as elements of urban infrastructure that can contribute to the organisation of urban life around it. The demonstration project explores potential locations at which the water channels could dovetail into green boulevards that create a seamless transition from the urban lands to the agricultural oasis, forming an integrated urban-ecological system.

As outlined above, the demonstration project focuses heavily on Action 3, taking into account and integrating themes from actions 1 and 2. The primary focus of the proposal is the provision of a new public realm that links the oasis ecosystem with the historic centres of Al-Ahsa. The dynamics of this new installation are then explored in reference to the potential for new connections, further greening and regeneration of the natural ecosystem, new mixed-use hubs and gradual densification. These strategies are also considered in terms of their collective economic impact on the surrounding neighbourhoods.

Fig. 7. Three systemic actions for structural change in Al-Ahsa

RESTRUCTURING THE URBAN FORM

3

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3.1 The Project's Tenets

Urban interventions can be defined as truly "transformative" when they have a catalytic, place-defining impact, creating an entirely new logic for portions of the city and a new set of possibilities for economic and social activity. Transformative urban interventions in this case are designed to trigger changes that are incremental and acupunctural, and that collectively comprise a new public dimension. These kinds of urban interventions are defined by their capacity to alter urban characteristics and dynamics:

- Cognitively, transformative projects redefine the identity and image of the city, creating nodes of new activities and new places for people to congregate.

- Environmentally, transformative projects enable cities to achieve their "green" potential by densification and consolidation of the urban fabric, by provision of accessible pedestrian connections and transportation alternatives and through the integration of the city with its agricultural heritage to create a shaded streetscape.

- Socially, when carefully designed, staged and leveraged, transformative projects can expand the housing, employment, and educational opportunities available to low-income residents and overcome social and economic disparities.

- Economically, transformative investments uncover the hidden value in the city, creating markets in new places or where they were only partially realised.

- Fiscally, transformative investments dramatically enhance the financial capacity of local governments, generating revenues through improved property values, growth in city populations, and expanded economic activities.

These projects are able to trigger a profound ripple effect of positive, multi-dimensional change in ways that fundamentally redefine the value and/or function of one or more of a city's parts. The Al-Ahsa demonstration project is based on four such principles or tenets, defined by the city's overarching issues and an impact analysis.

The four tenets are:

- Establishing urban connections
- Restructuring the existing built fabric to integrate a pedestrian accessible public realm
- Strategic densification via infilling of vacant/ underdeveloped land
- Rebuilding the green and blue networks

King Abdulaziz Road

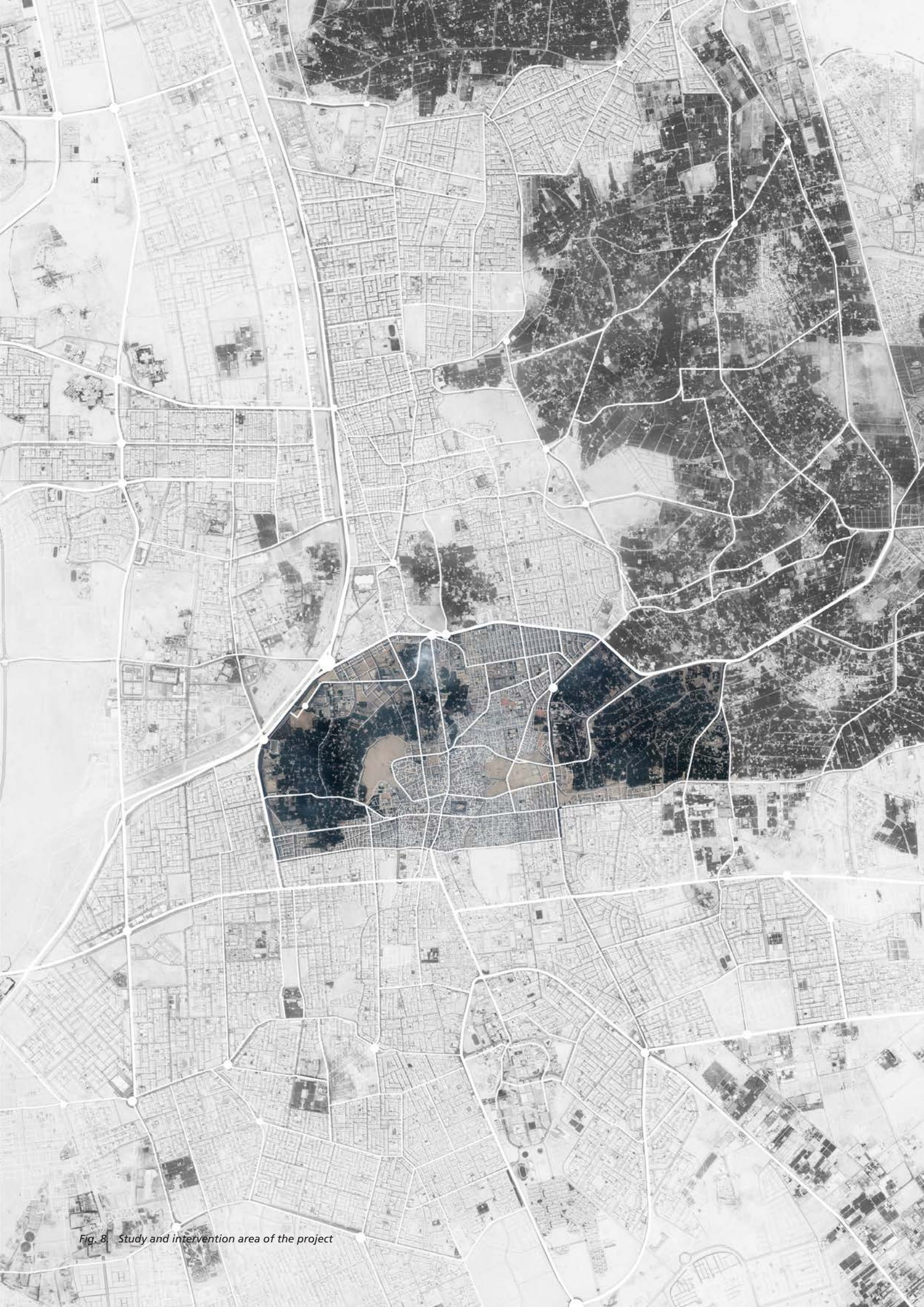


Fig. 8. Study and intervention area of the project

3.2 The Vision for Al-Ahsa, An Urban Cultural Oasis

Both the Strategic Vision and the Action Plan emphasise the requirements for a respectfully integrated natural environment and a hierarchical, coherent, and harmonious urban structure in Al-Ahsa. The demonstration project is conceived as an operational interpretation of the Action Plan, which forms the catalytic basis for the city's fulfilment of the Strategic Vision

The proposal's elements are designed to create a holistic contribution to Al-Ahsa's future and to the future of its Oasis which has already been declared a UNESCO World Heritage Site.

- The pedestrian network is designed to integrate spatial hierarchies that connect the Oasis date palm agriculture and the existing irrigation canal network to the built-up area, its heritage sites and existing landmarks. This is achieved partially through the extension of the canals to form a closed loop system with natural filtration. The canals will form an integral element in the streetscape and feed a planting programme that will shade the pedestrian networks.

- Consolidation of the existing built-up form through infillings of vacant and underdeveloped land will provide proportionate and defined public spaces and connections between the existing heritage sites, landmarks and new facilities. This will reduce dependency on private vehicles and increase mobility in the urban centre.

- A series of new facilities are proposed to enhance the existing character and economic contribution of the oasis and to diversify the local economy by cultivating the tourism sector. Visitors will be able to learn more about the Oasis through these facilities and they will provide new revenue for the city.

The existing vehicular connection along the major north-south axis of King Abdulaziz Rd connecting Hofuf and Mubarraz historic city centres, and the proposed accompanying public transportation line is enhanced by the demonstration project's mobility strategy and new programmes that link multiple nodes with the historic sites, facilities and public plazas. An additional electric transport line is proposed to cross centrally from east to west to further bolster multi-modal accessibility in the city.

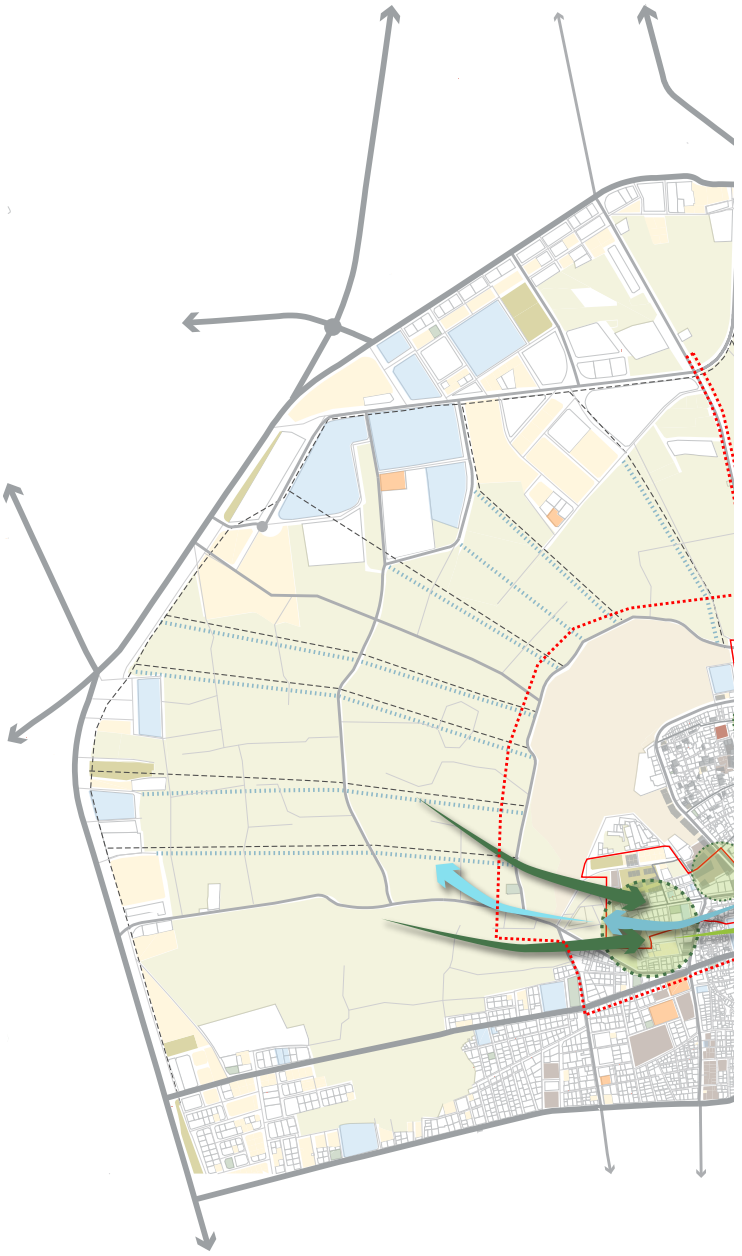
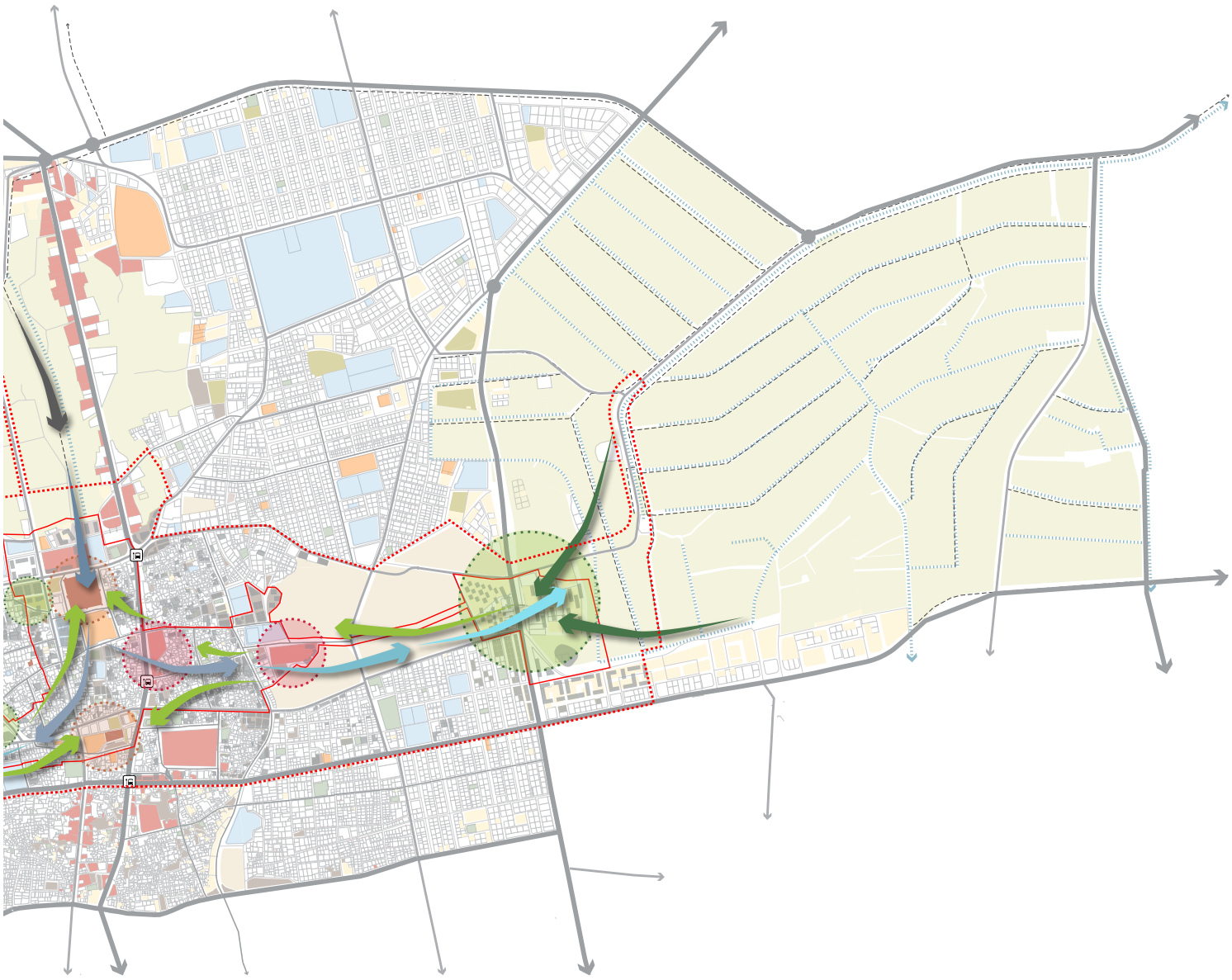


Fig. 9. Strategic vision for Al-Ahsa



- Area of influence
- Intervention area
- Current road network
- Canals
- Drainage system
- Water canals extension
- Green extension
- Pedestrian system
- Public transport stops
- Commercial nodes
- Heritage / cultural node
- Future facilities node
- Religious services
- Public facilities
- Current built up area
- Infill development
- Heritage
- Cemeteries
- Governmental areas
- Vacant land
- Formal / Informal parking
- Agriculture
- Green spaces
- Main commercial areas

LINKING HERITAGE AND CULTURAL NODES THROUGH PUBLIC SPACE, PEDESTRIAN AND ECOLOGICAL NETWORKS

4

4.1 Defining the Study Area

The demonstration project has been developed primarily to address the disconnection between the historic urban and agricultural portions of the city and surrounding agricultural lands to consolidate the city's status as a historic oasis of agricultural and architectural importance and to leverage its green reputation to improve resilience and diversify its economy through tourism.

The design sought to establish anchor points outside of the central intervention area to ground the project in its context and to demonstrate the holistic impact of improved connectivity across the urban extents, softening the border to the farms on the periphery. It was important to identify areas of neglect or voids that were impactful on the city's consolidation in order to address these through targeted infills, the programs of which will be outlined in the relevant sections of this report. All infill development, greening and studies presented here are intended to contribute to a newly integrated network of mobility systems in Al-Ahsa. Those mobility systems refer to road networks that support both public and private vehicular transport, street and public space networks that support pedestrianisation, and water networks that integrate the two sides of the oasis with the city and support further greening within the urban core. The demonstration project recognises the public transport line proposed in the Strategic Vision for Al-Ahsa and integrates this proposal.

The planning of the above mentioned mobility systems was based upon the placement and nature of existing landmarks within and on the periphery of the urban core of Al Hofuf. This includes the Ibrahim Palace, the Historical Yard and the Princes School, the Qaisariah Souq and the existing pedestrian street that stretches from the southern point of Qaisariah Souq to the east end of the block, the artisanal market and the existing vegetable market on the border of the eastern plantations.

The existing irrigation canals and drainage systems for the palm plantations have also been considered and have informed the proposal for a linked network that can cut through the city and service a planting strategy. The planting strategy and accompanying canal extensions are intended to accompany public space and pedestrian street networks and become an integral element of the streetscape for natural shading and reduced heat island effects.

The study area, is defined on the opposite page by a dashed yellow line and was considered as both a contextual driver and impact zone for the proposed interventions. In order to transform the significant area of the city defined as the intervention area, it was not possible to consider this section in isolation from its surroundings or from the potential impact that it could have beyond its own boundaries.

The area of influence is defined as those areas that will be most directly affected and, in turn, have had the most influence on the plan for intervention. This area is defined by the palest yellow overlay in the image on the opposite page.

The area of intervention is strongly highlighted in yellow, and constitutes the areas of direct intervention that shape the core of the proposal.

View of the Al-Ahsa oasis

Fig. 10. Different scales of analysis and interventions

4.1.1 Mobility

The proposal provides strengthened primary links from north to south and east to west creating a cross that retains the historic city centre at its axis. Infills are designed to regenerate the city through the creation of a network of pedestrian streets that connect new public squares and parks across the above mentioned cross, emanating outward to connect surrounding landmarks.

The east-west axis is created through the elongation of the existing pedestrian street at the southern point of Qaisariah Souq. The proposed elongation extends this street eastwards through the cemetery to the edge of the palm plantations in the eastern periphery and westwards to the football pitch in the western periphery. This new street is anchored at each side with newly proposed commercial hubs comprised of extended sports facilities and a hotel in the west and a seeds research centre, auditorium and agro-hotel in the east.

The transport line proposed in the strategic vision for Al-Ahsa will provide a stop at the Qaisariah Souq which strengthens the pedestrian connection on the east-west axis that crosses south of the Souq. The demonstration project proposes and additional electric transport line to strengthen connections on the east-west axis.

At select points, the irrigation canals from the agricultural lands are proposed to bisect and continue into the city as green boulevards, expanding the green pedestrian network. The extension of this system will support the proposed greening that the proposal disperses through the central axis.

The many informal parking areas that occupy vacant lands within the city's current built form are largely re-appropriated in this plan and reassigned to newly proposed programs that should integrate underground parking in a way that collectively comprises a comparable volume. In this way, the volume of available parking in the city is retained and simply hidden under a newly consolidated built form. The planning for the parking redistribution is intended to retain parking at the outer edges of large blocks, reserving the internal areas for pedestrian priority. Car access should be restricted to service cars and residents.

Dhahran Road, one of the main arteries of Al-Ahsa

Fig. 11. Current mobility network

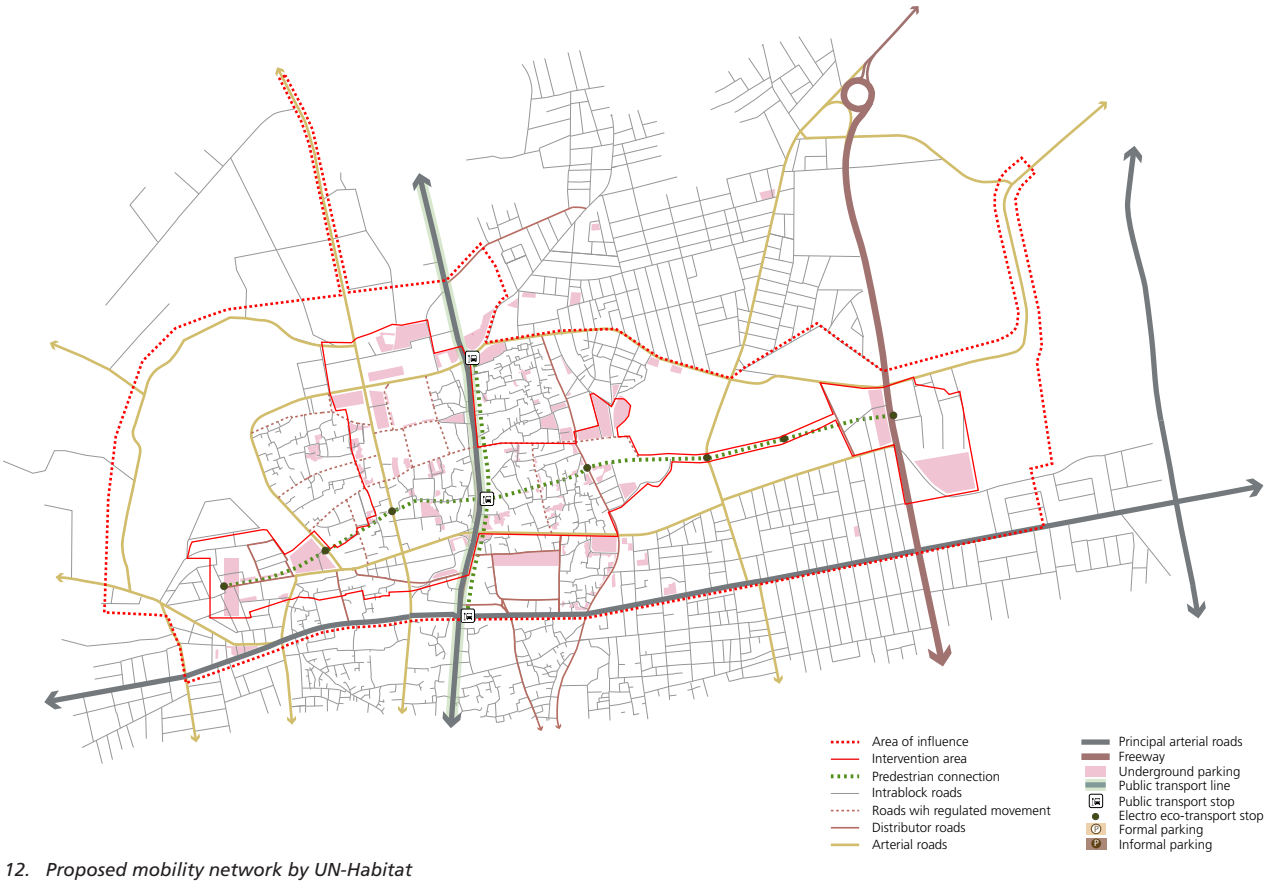
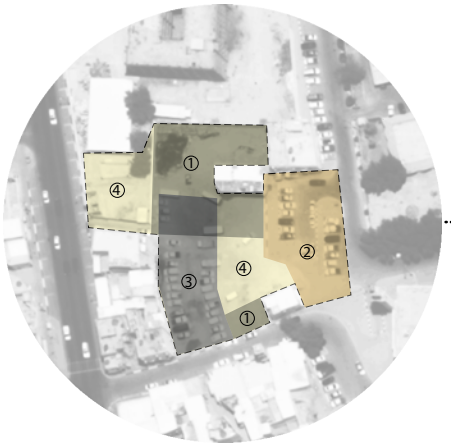


Fig. 12. Proposed mobility network by UN-Habitat

4.1.2 Reintegrating vacant land as pedestrian networks

The analysis of the existing urban fabric identified a number of vacant parcels that loosen the urban form. Many of these parcels have been identified in the analysis as being used for informal parking. The parking has been reassigned to relevant programmatic interventions underground. This frees these spaces to reintegrate the city surface through pedestrian networks that connect relevant landmarks and integrate the agricultural lands on the periphery with the urban core.

The pedestrian networks form connections on the north-south and east-west axis and have been assigned a number of connected green spaces and public squares that are dispersed throughout the urban form as infill on previously vacant land. The prioritisation of the pedestrian will form a new public realm in Al-Ahsa, and provide connections in the city that enhance its heritage. The infilling of vacant land with strategic distribution of new residential areas with integrated commercial premises, commercial hubs and public space will articulate and support the city's existing features and increase land values across a more equitably accessible and publicly inhabitable fabric. The pedestrian network will also provide improved access to the transport system proposed in the Strategic Vision for Al-Ahsa. Improved access through both pedestrian networks and public transport, will heighten the value of proposed mixed-use hubs that should be concentrated around the public transportation stops. The pedestrianised connections that cross the city are intended to drastically reduce car usage in the city centre.



① Area considered as vacant
② Formal parking
③ Informal parking
④ Underdeveloped area

Fig. 13. Components of developable land

Vacant land in the project area

Fig. 14. Current vacant and underdeveloped land

Fig. 15. Proposed public space by UN-Habitat

4.1.3 Built fabric

The analysis of the existing urban fabric identified a number of vacant parcels that loosen the urban form. The diagram demonstrates a potential future form for the city if these spaces are developed in appropriate volumes that leave voids for pedestrian networks with connections occurring at appropriate intervals for the purposes of mobility. These networks should also be planned to redefine a proportional hierarchy of connected pocket squares and open spaces. This type of planning will reduce dependency on personal vehicles thus improving congestion and reducing pollution.

This infill development is proposed as a future evolution of the city to be encouraged through policy and is demonstrated by the two drawings adjacent that show the current form and potential development indicated in red. These volumes are hypothetical but as stated, a setback should be included as reservation for pedestrian access. These future infill developments are indicated as additional to the project's propositions for pedestrian routes and public spaces. They are proposed to include residential development (60%) commercial and public facilities (20%), and offices (20%)

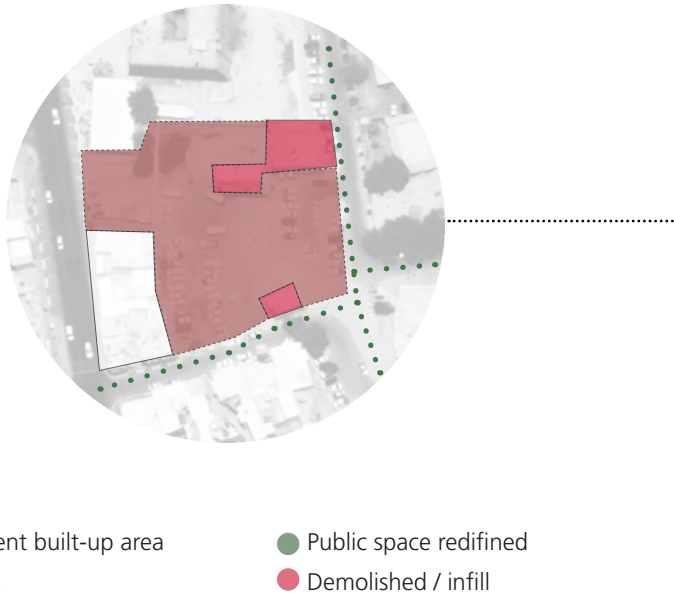


Fig. 16. Infill strategy

Current built fabric

Fig. 17. Current built-up form

Fig. 18. Proposed built-up form by UN-Habitat

4.1.4 Key landmarks

Landmarks have defined the strategy for the demonstration project's structure in Al-Ahsa. The top drawing on this page (Fig.20) indicates the landmarks that the proposal endeavours to connect and therefore provide with elevated status through integration with the new pedestrian networks and the city's proposed transportation system. This will generate improved access and consolidate the identity of the city and its places of importance. The landmarks identified in this diagram include the vegetable market in the eastern periphery, the cemeteries, the artisanal market and Qaisariah Souq various educational facilities, the mosque and a number of important architectural heritage sites as the Ibrahim Palace, the Historical Yard and the Princes School among others.

The drawing below (Fig. 21) indicates a number of propositions for new landmarks marked in red that further anchor the structure of the mobility networks and constitute and economically strategic vision for Al-Ahsa. These programs are intended to enhance the status of agriculture in Al-Ahsa and diversify the local economy to include tourism. Al-Ahsa's unique ecology and heritage provide the city with a comparative advantage in this sector that the proposal envisions as emboldened through these anchorages and their dynamic relationship with the mobility and green networks.

In the western extremity of the city, an innovation and ecological hub comprises an eco-hotel with an agricultural research facility and auditorium. This connects to the existing vegetable market and defines what is currently an open market space as a shaded market square, delimited by pergolas. On the western side a sports hub is proposed as an extension to the existing football pitch and includes basketball, volleyball and tennis courts, an Olympic swimming pool and an additional hotel with an interpretation centre. In the north, a museum and a community centre are proposed in proximity to a number of heritage sites.

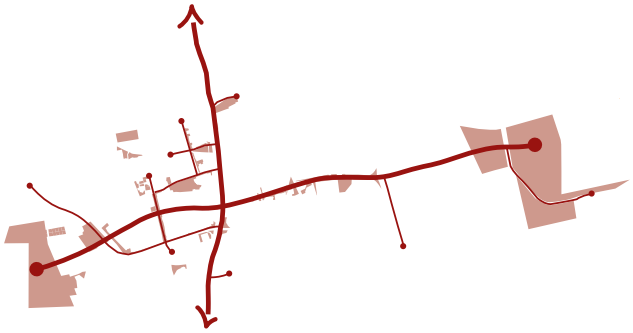


Fig. 19. Major landmarks links

Qaisariah Souq

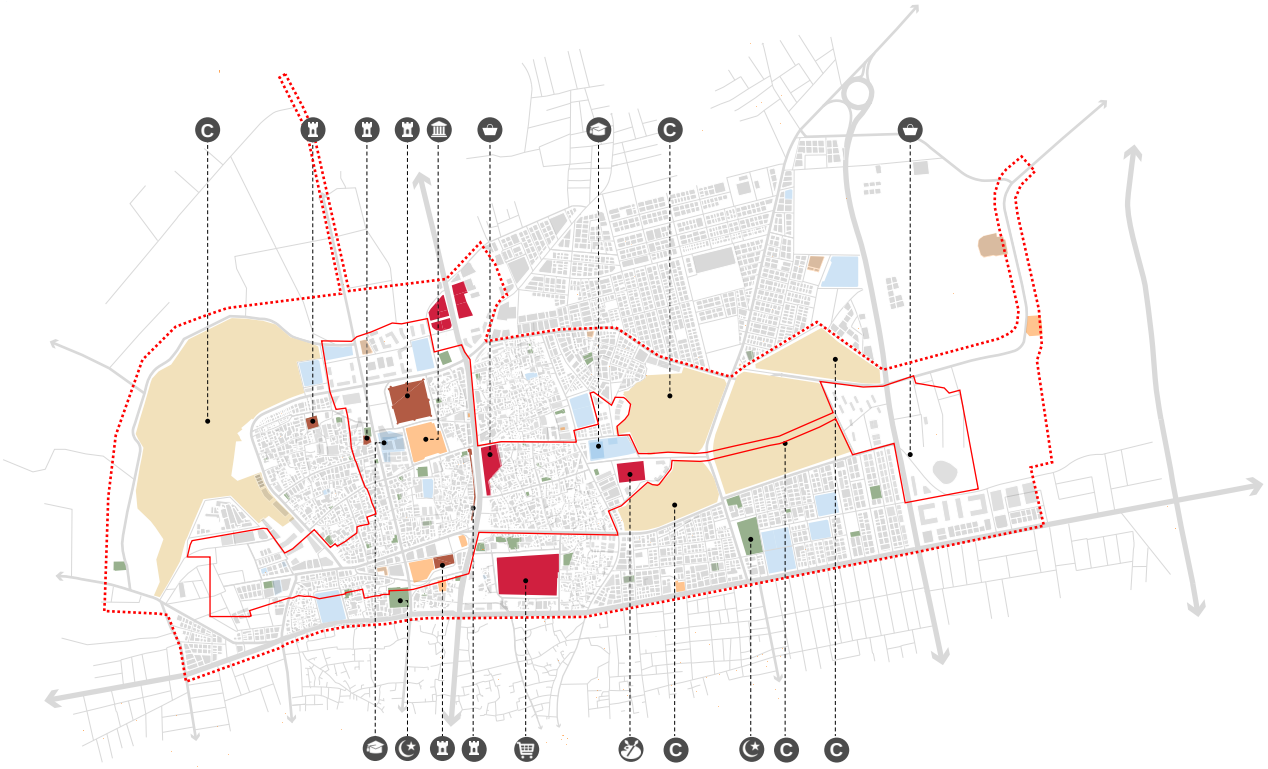


Fig. 20. Current landmarks

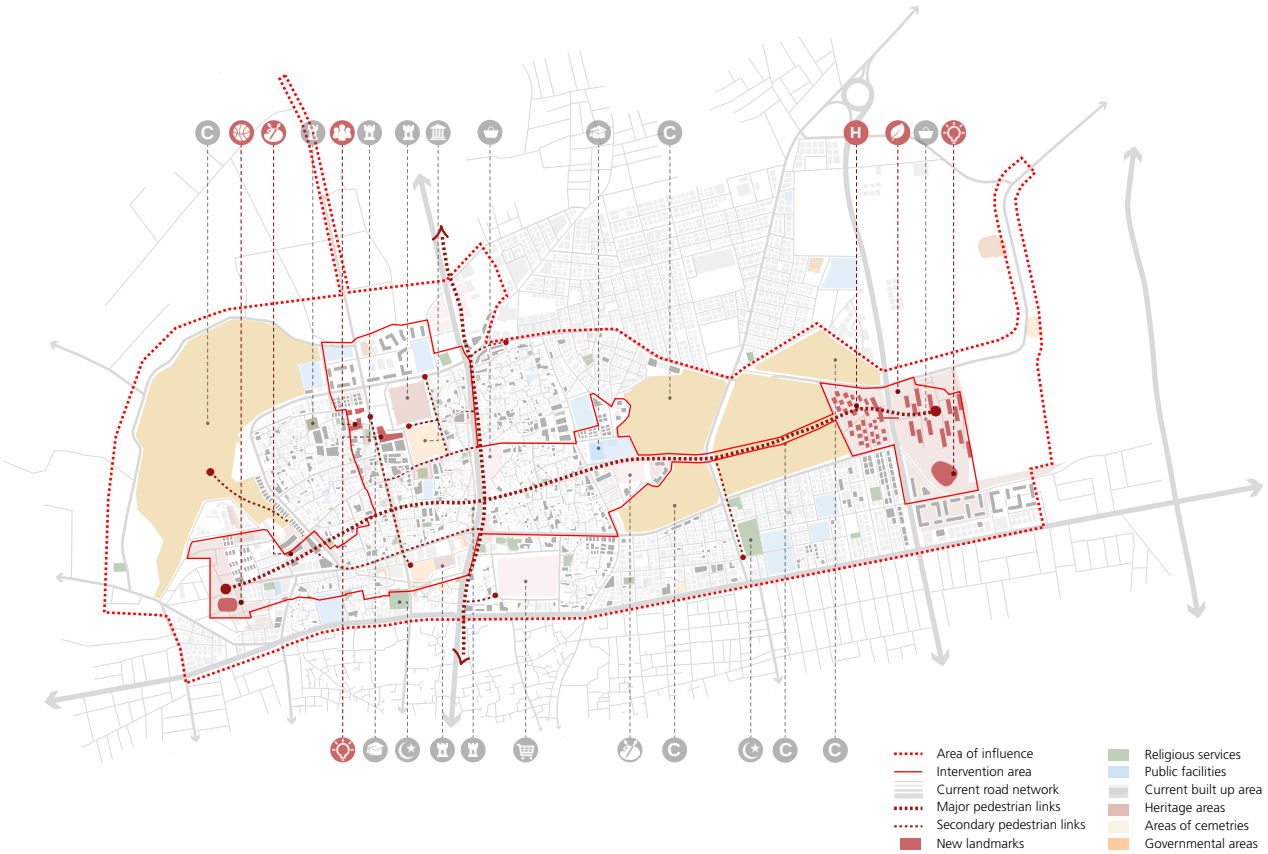


Fig. 21. Proposed landmarks by UN-Habitat

4.1.5 Green network

Existing green space is marked in the drawing opposite which highlights the strong divide between the agricultural land and the built-up area of the city. The drawing demonstrates that currently very little public green space exists within the city. Though greening in this climate can be expensive, the extension of the canals to connect the agricultural areas at the east and west sides of the city can support a greening programme that would produce a favourable microclimate that would greatly improve the citizen experience of the city. Natural shading will reduce heat island effects and absorb CO^2, reducing pollution.

The drawing below demonstrates the proposal's use of vacant land to build an urban green network that integrates the agricultural heritage on the periphery of the built-up area with the city centre. This network comprises a hierarchy of spaces from large parks in the proposed hubs and on the central axis in proximity to existing landmarks, to a series of pocket squares that are evenly distributed to provide equitable access to all citizens.

The cemetery areas are shown as planted to demonstrate possible futures as incorporating sensitive planting to provide shade for those visiting their loved ones or as potentially relocated to a less central position in the city. In such a scenario these spaces could become parks or urban farms.

Fig. 22. Historical Yard green expansion strategy

Privately owned date palm farms

Fig. 23. Current green spaces

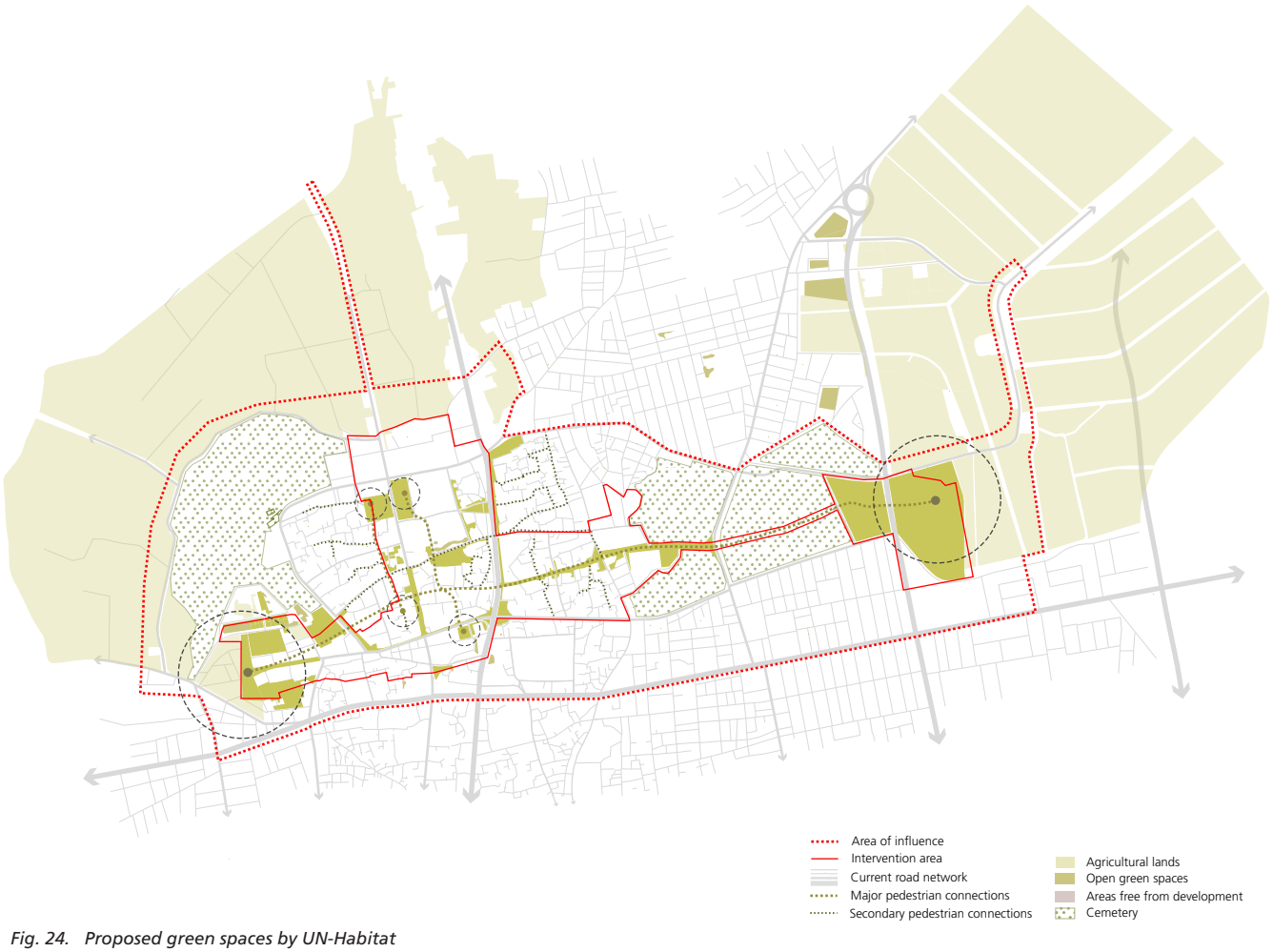


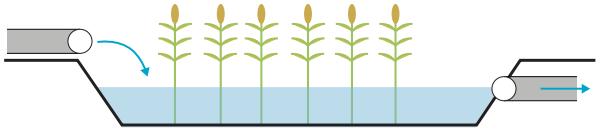
Fig. 24. Proposed green spaces by UN-Habitat

4.1.6 Water

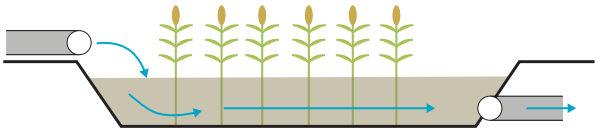
The canals situated in the agricultural lands on both sides of the city offer an important opportunity to integrate water and greenery with the city, thus creating a symbiotic urban agricultural relationship. These canals and the drainage system can be adapted to serve multiple purposes in the city. The project proposes a closed loop that connects the irrigation canals through the city, maintaining their agricultural functions and additionally forming an integral element in the new streetscapes of the city that feed an urban greening program.

The project suggests the addition of reed-bed filtration ponds adjacent of the current drainage site, from which water should flow through the filtration beds, entering the city clean and dispersed through urban canals to re-enter the agricultural fields. Additional natural filtration sites are suggested to be included before re-entry to the fields to ensure any debris from the urban centre is removed.

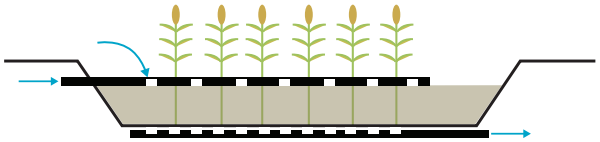
The plan suggests that the canals should bisect at strategic points to form green boulevards that integrate with the pedestrian networks and feed planting in the indicated green networks in the previous section thus forming a holistically integrated system of streets, squares, open spaces and canals that connect the historic agricultural character of the peripheries with the city centre.



a) Surface flow:
The free-flow systems replicate the same self-cleaning mechanisms as wetlands. They consist of shallow, impermeable basins or canals a few centimeters deep, with a substrate that provides support for the roots of emerging plants. They require a large surface area.



b) Horizontal submerged flow:
In submerged flow systems the flow of water remains below the surface of the substrate and flows horizontally. Such plants consist of waterproof basins filled with the permeable substrate. The alternation of aerobic zones and anaerobic zones involves the development of several families of specialized microorganisms, which define an almost complete disappearance of pathogens.



c) Vertical submerged flow:
In vertical flow systems, the waste to be treated is made to percolate vertically through a filling medium. The feeding takes place through submerged pumps or siphon systems where slopes allow the entry of fluids into the basin by gravity.

Fig. 25. Phytoremediation types: Operating schemes of macrophyte systems

Current state of one of the canals

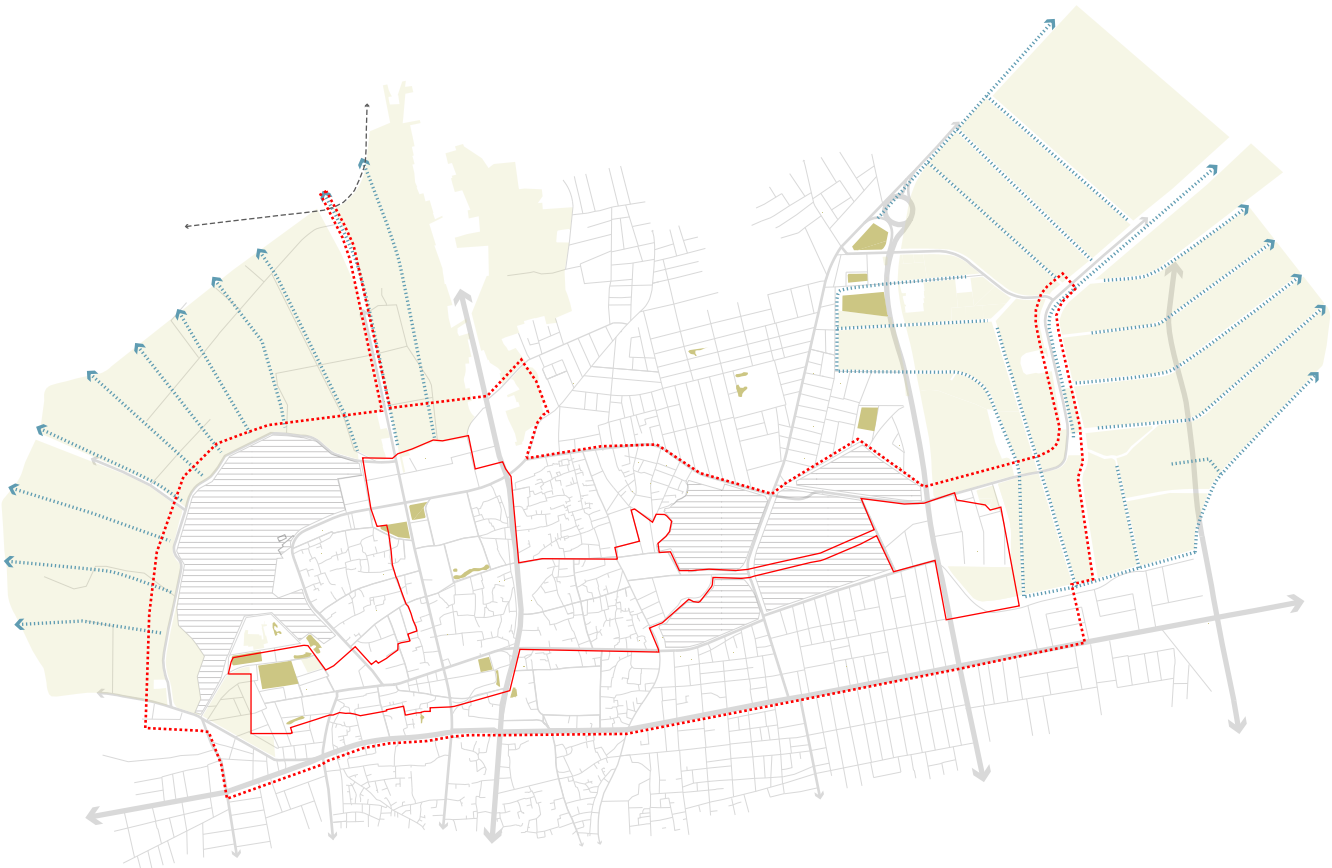


Fig. 26. Current water system

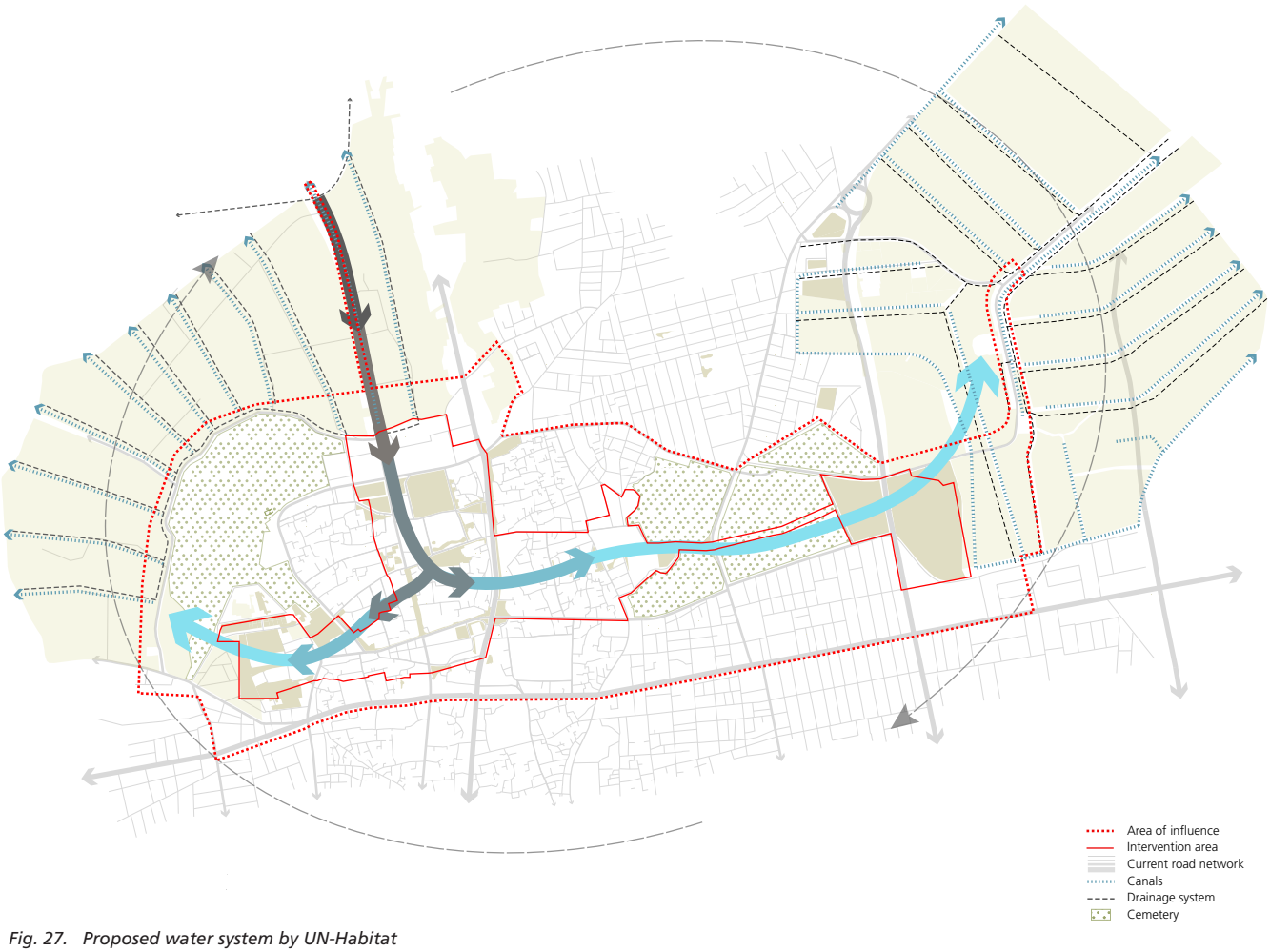


Fig. 27. Proposed water system by UN-Habitat

4.2 Creating a New Public Realm for Al-Ahsa

The actions outlined previously are intended as a holistic system of interventions that inform and strengthen each other. All interventions are intended to soften the boundary between the agricultural outskirts and the city itself in order to serve Al-Ahsa's economy, ecology and its citizens. The new circulation systems and the integrated network of hierarchically proportioned squares and open spaces are designed to provide Al-Ahsa with a public realm that serves several functions: Heightened connectivity and integrated public transport will make the city more accessible to its citizens, give more anchorage to the city's heritage and landmarks, reduce congestion and pollution, and provide higher levels of visitation for commercial centres.

Urban greening and an integrated canal network will shade the streets and reduce urban heat island effects making the streets more comfortably usable. The reassignment of parking to the exterior of city blocks will prioritise pedestrians, further enhancing the above mentioned environmental impacts.

The heightened accessibility and quality of life for citizens will elevate property values and the new programmes proposed will enhance Al-Ahsa's potential to attract tourism.

Fig. 28. Vision of the considered area

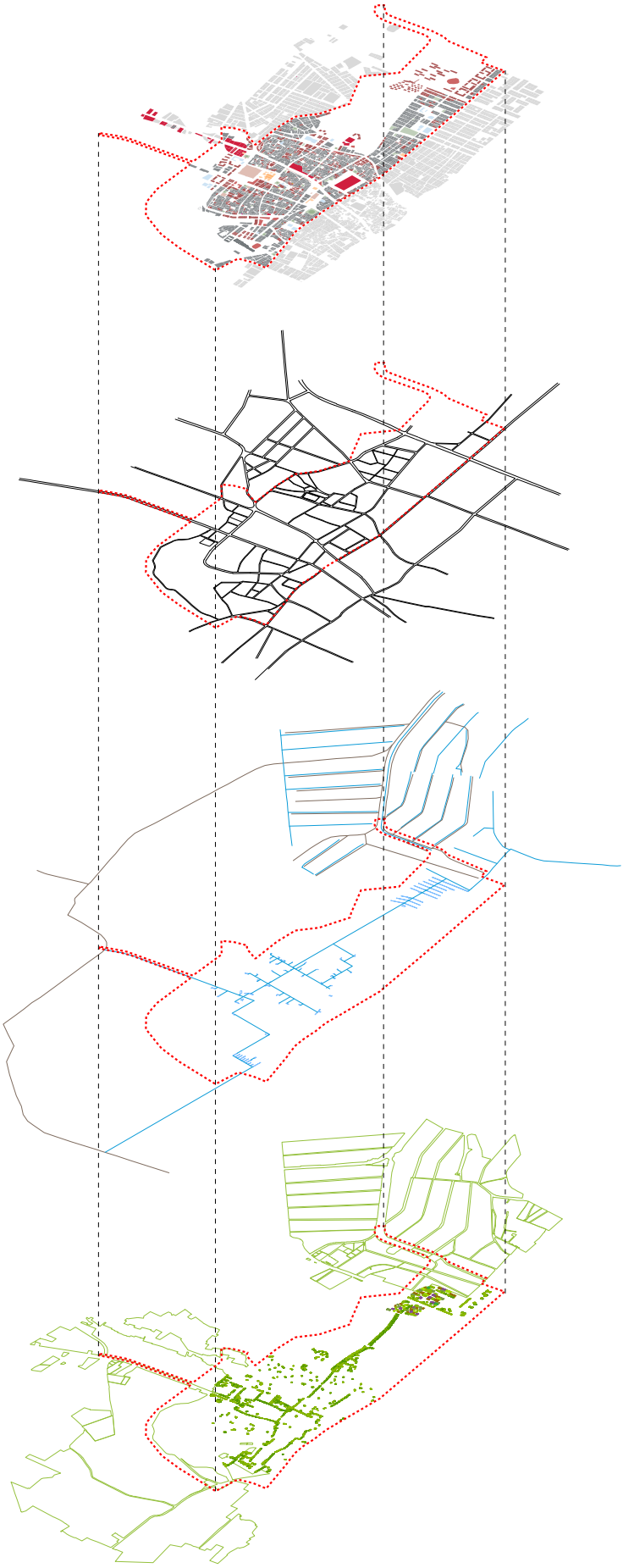
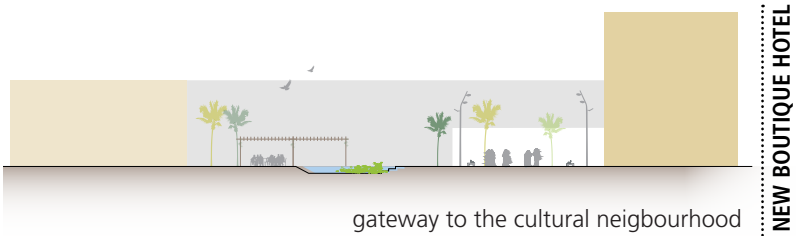


Fig. 29. Overlay of the green space, water channels, roads and built infrastructure in the intervention area

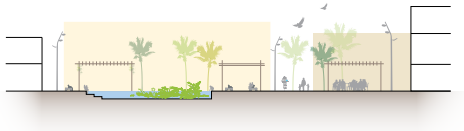
Fig. 30. Masterplan for the project


0 50 100 200
N



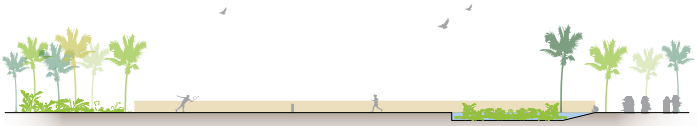
gateway to the cultural neigbourhood
tourist and community services
landmark

NEW BOUTIQUE HOTEL



NEW PLAZA

pedestrian friendly
horizontal connectivity
commercial and cultural activities



NEW SPORTS' VILLAGE

city and neigbourhood level service
green and blue connectivity
healthy lifestyle

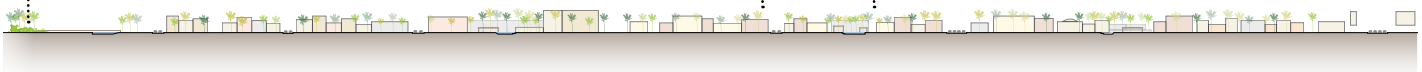
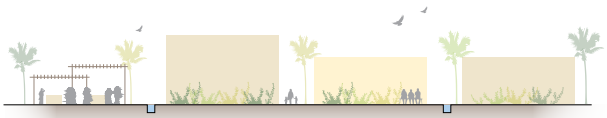


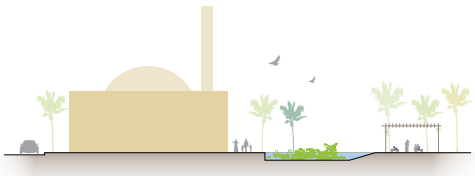
Fig. 31. Masterplan cross-section and detailed sections

Reference pictures for the public space



community market, research and development agro- hub
linear green and blue systems
support to small-holding, organic farmers market

VEGETABLES MARKET AND NEW AGRO-INNOVATION VILLAGE

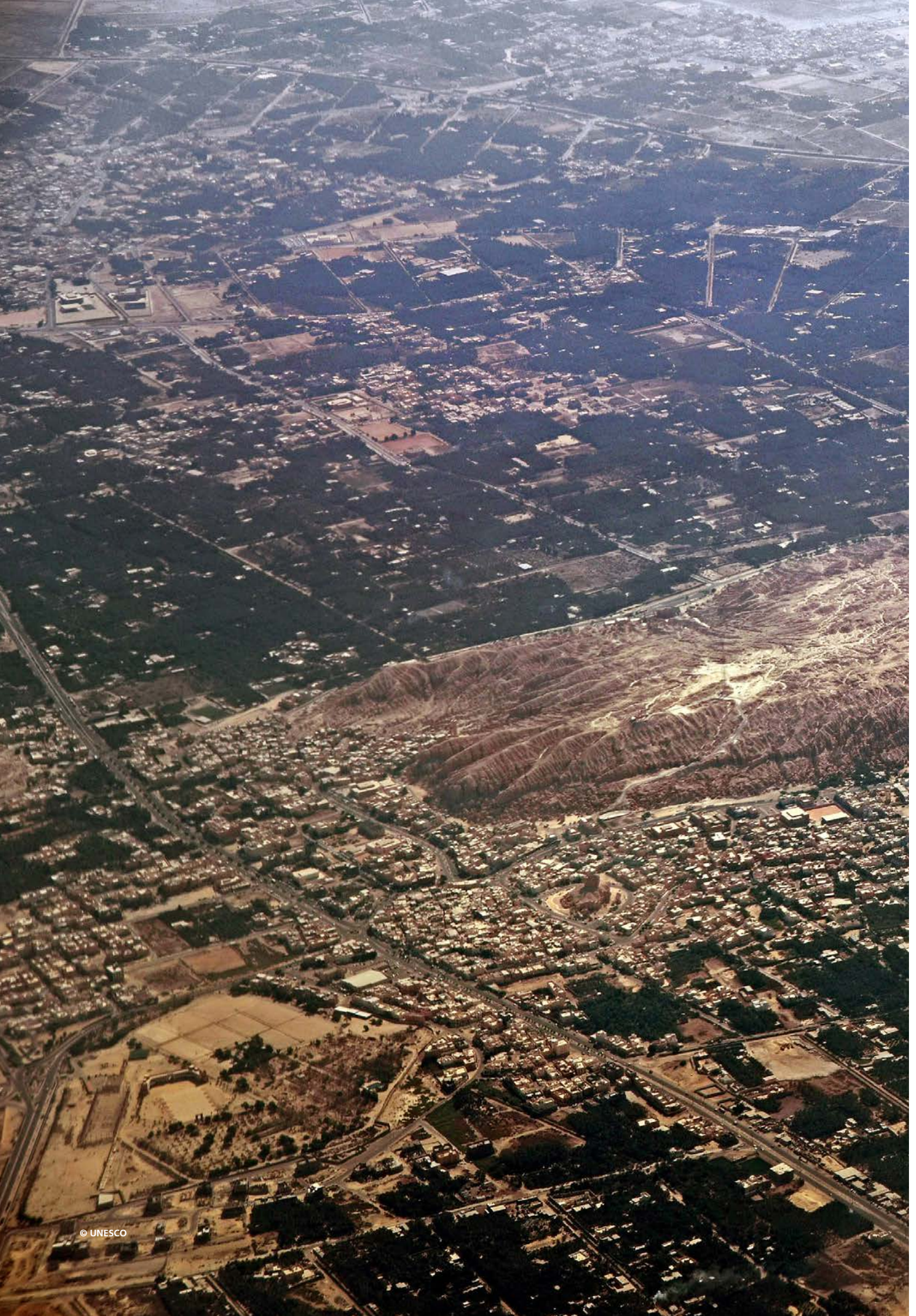


enhance public space for public facilities
major water feature
micro-climate through shading and green

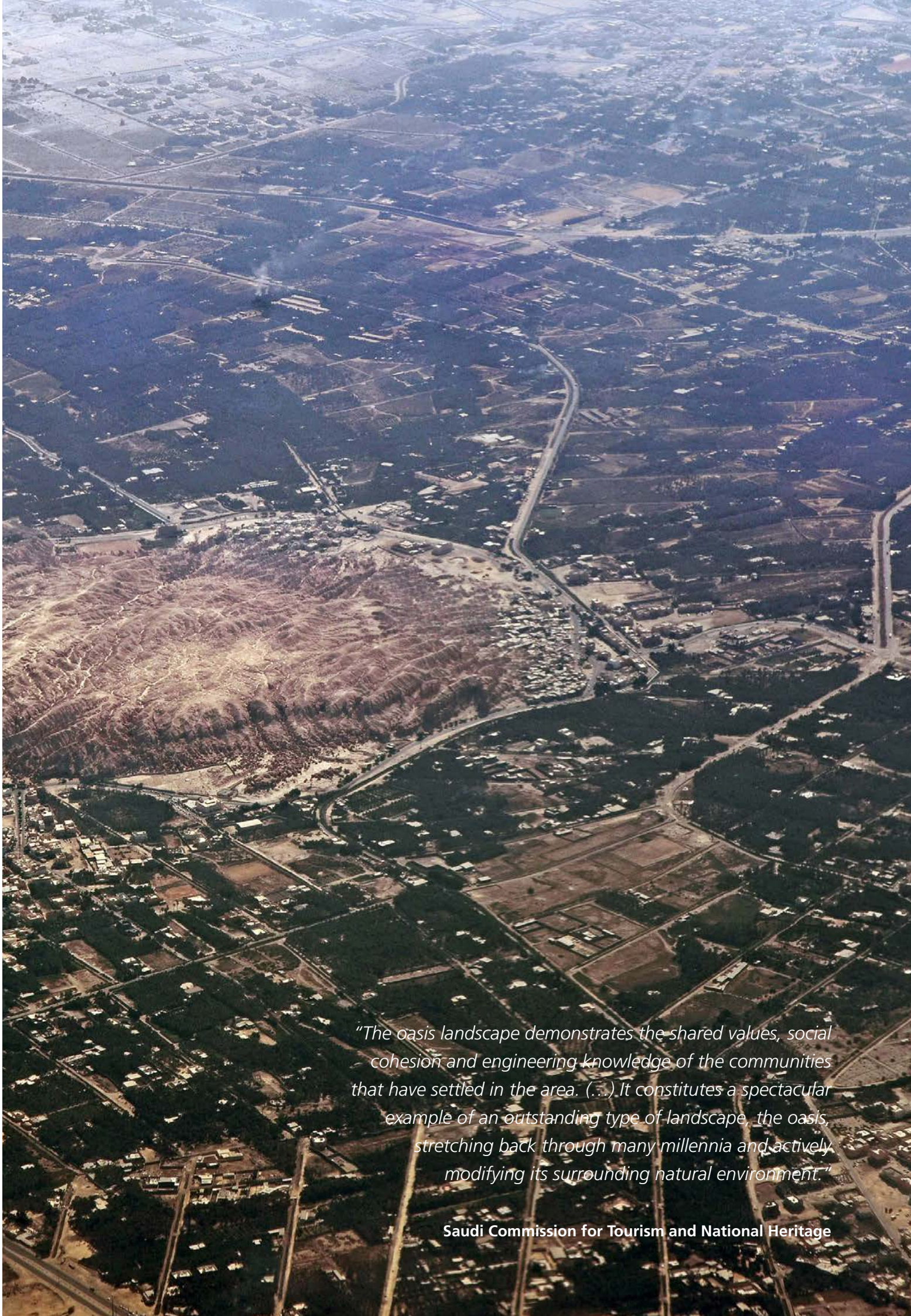
NEW MOSQUE PLAZA NEXT TO THE ARTISANS MARKET

NEW AGRO-HOTEL

diffused hotel
eco-tourism
experiential tourism



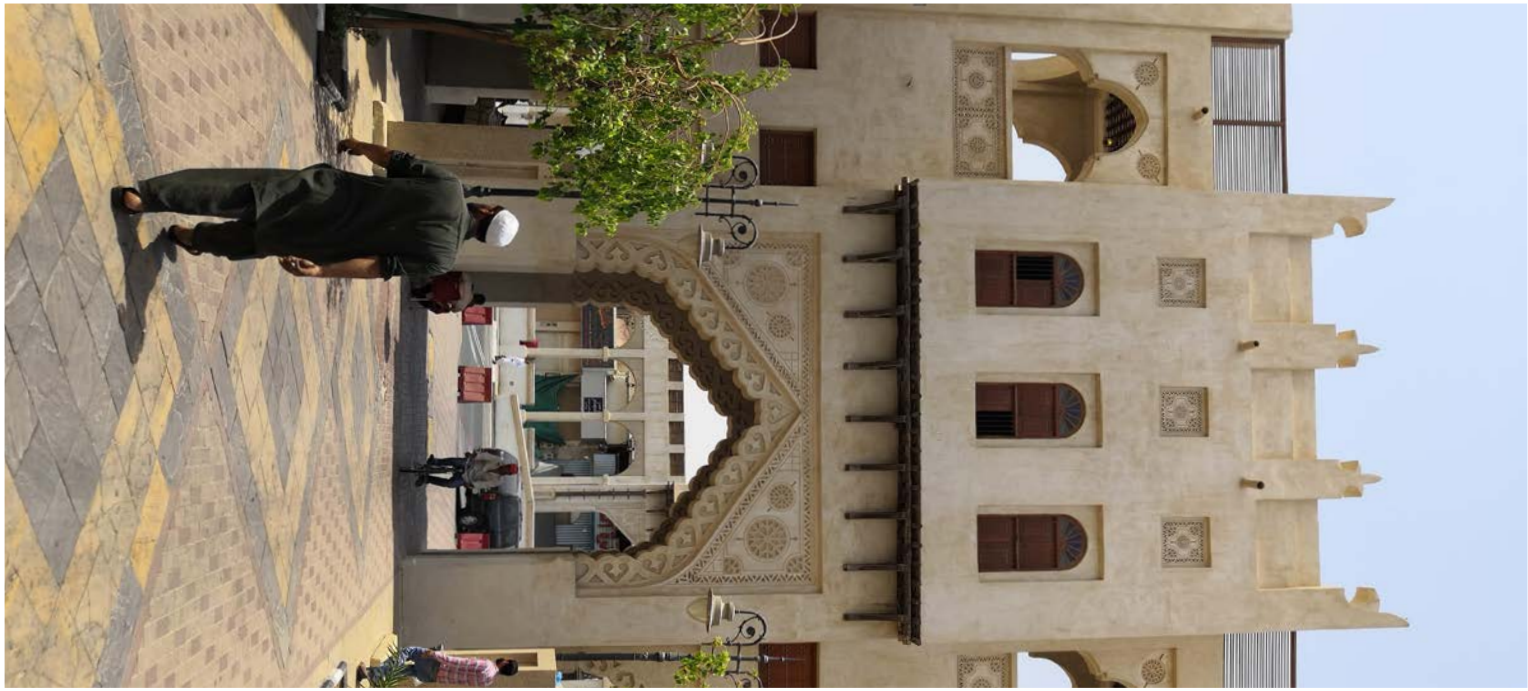
© UNESCO



"The oasis landscape demonstrates the shared values, social cohesion and engineering knowledge of the communities that have settled in the area. (…) It constitutes a spectacular example of an outstanding type of landscape, the oasis, stretching back through many millennia and actively modifying its surrounding natural environment."

Saudi Commission for Tourism and National Heritage

ELEMENTS OF THE NEW PUBLIC REALM



5.1 Streets and Public Spaces

5.1.1 Reorganized mobility

The demonstration project integrates the public transportation line proposed in the Al-Ahsa Strategic Plan that follows the north-south axis and cuts vertically through the centre of the city. This line has a strategic stop next to the Souq, from from which pedestrians can take the newly formed transversal street on the east-west axis or the proposed electric transport line which follows the same route through the city, connecting the two proposed hubs at the east and west sides of the city periphery.

Underground parking lots have been placed strategically at the edges of large blocks in order to reduce the vehicular traffic and offer priority to the pedestrian in the historical centre. Various levels of pedestrianisation are proposed in the city centre as vehicle accessible, restricted semi-pedestrian and exclusively pedestrian.

The restriction of vehicular access can be controlled and it is suggested that access be granted in semi-pedestrian areas to residents or service vehicles during defined periods of time. This system is designed to alleviate traffic in the city centre and to provide a more inclusive public realm that is more accessible due to reduced congestion, reduced pollution and reduced heat island effects with the combined use of public canals and natural shading.

5.1.2 Public spaces network

The new public squares and pedestrian networks have been introduced in such a ways as to form a harmonic hierarchy with the existing and proposed landmarks and mobility systems of the city. The landmarks define the surrounding spaces and connections, defining thematic pathways through Al-Ahsa. The largest squares and open spaces are proposed adjacent to landmarks such as the proposed sports and innovation hubs at the eastern and western sides of the city and in the vicinity or immediately adjacent to important heritage sites such as the Historical Yard and Ibrahim Palace.

As outlined in 4.1.3, infilling has been strategically planned to accommodate set percentages of residential, commercial and public facilities. Commercial spaces are suggested in new plazas and squares to articulate and encourage use of public space. Cafes and shops are planned to face into these new elements, creating a vibrant atmosphere. This will additionally support the growth of tourism in Al-Ahsa, providing diverse activities for visitors, supported by the proposed hotels, commercial hubs and newly connected heritage sites.

Secondary or intermediate sized squares are proposed to articulate the green axis that forms a cross on the core access routes of the city from north to south and east to west.
Small squares and pocket green spaces are designed to emanate from this central cross throughout the fabric of the city, providing access to those areas between and drawing those external areas into the central mobility axis, further articulating its role in the city.

All propositions for public space are formed as an overlay on currently vacant or underdeveloped land in the city, turning an unconsolidated form into a clearly defined hierarchy of accessible mobility systems and usable spaces that articulate the important landmarks of the city's history and economic trajectory.

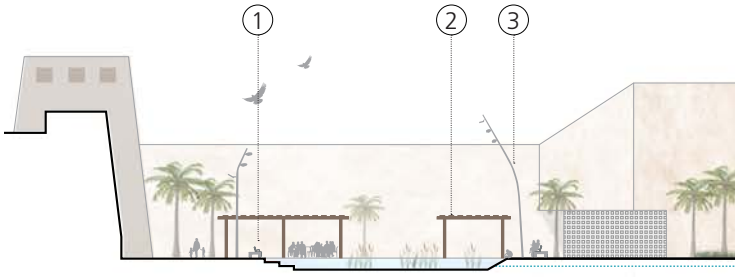


Fig. 32. Masterplan Zoom 1: Heritage and cultural area section

Fig. 33. Urban elements' references

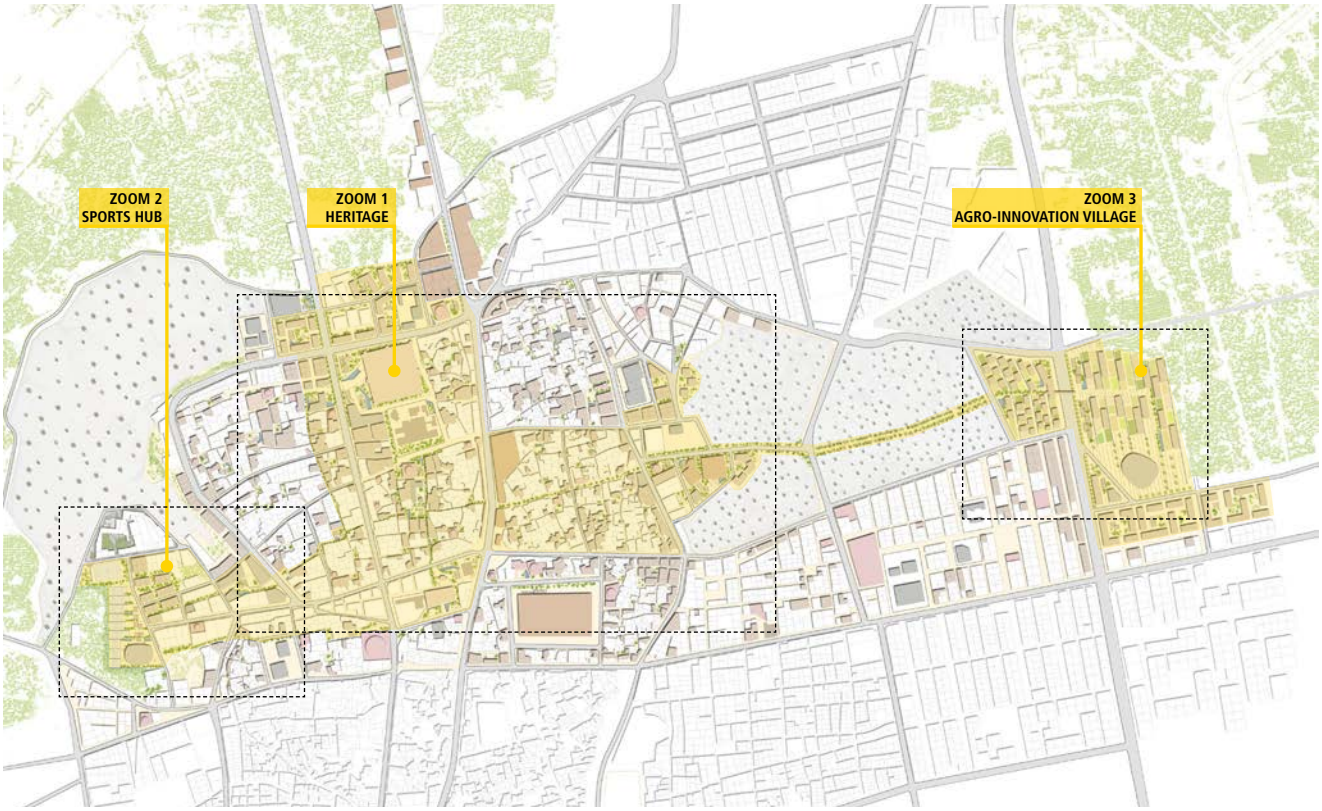
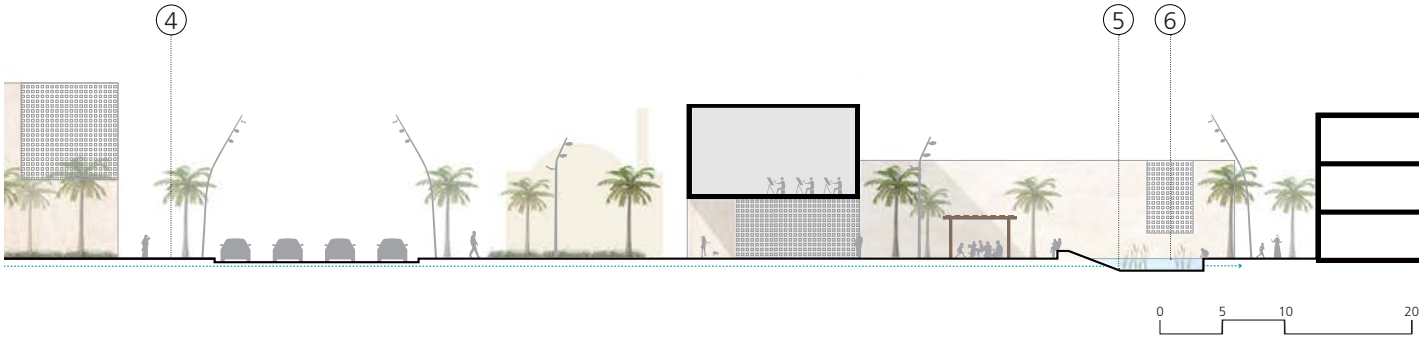


Fig. 34. Masterplan diagram showing the different zooms in the intervention area



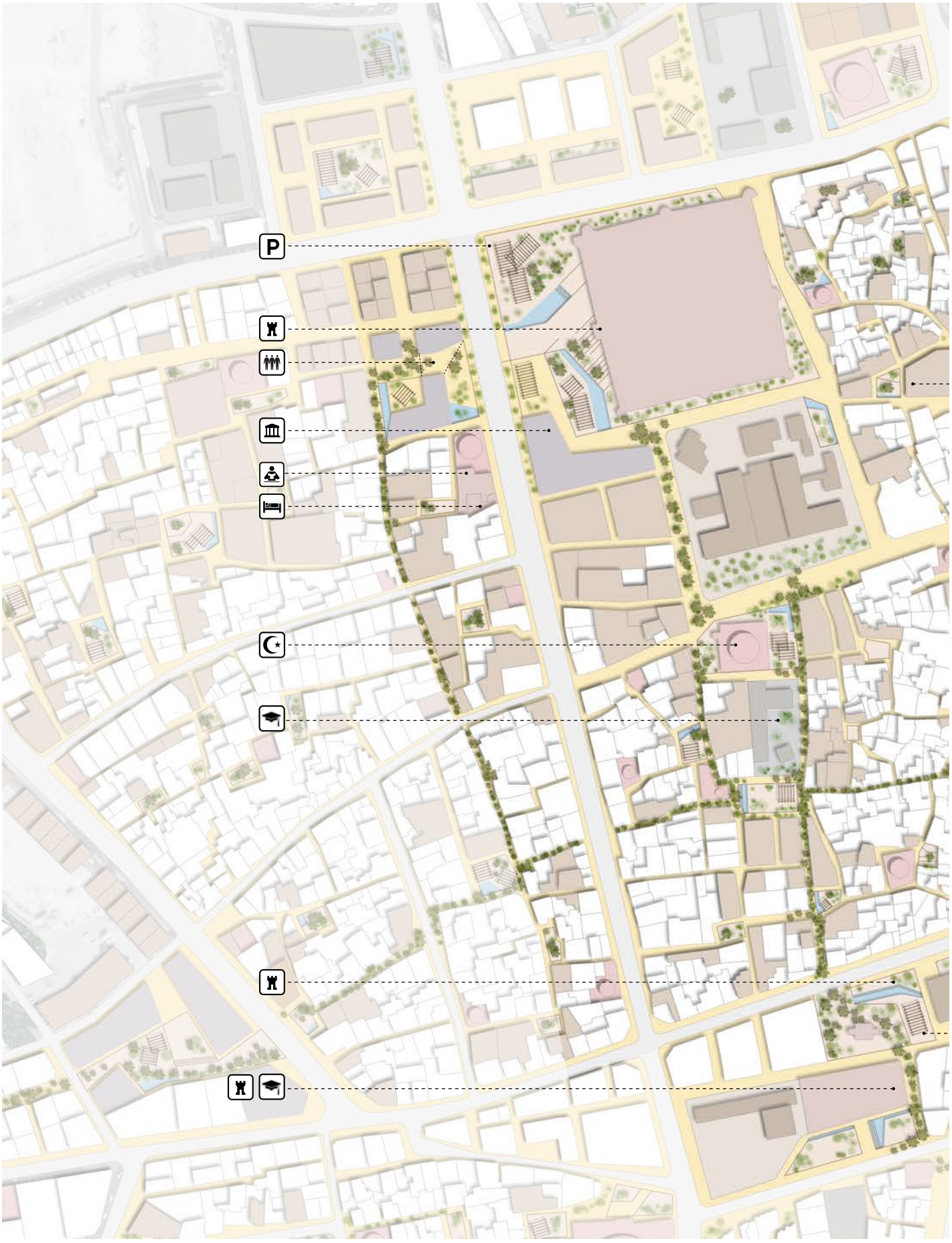


Fig. 35. Detail plan zoom 1


P
P
P
P
Open public space / pedestrian streets
Paved open public space (squares)
Water surface
Vegetation
Pergolas
0
25
50
100
N

5.2 Functional Relations Between Green and Blue Systems

5.2.1 A functional and diversified green system

An extensive greening programme is proposed for the area of Al Hofuf that is intended to integrate the natural appeal of the oasis surroundings with the built fabric of the city and provide essential relief from the heat that the area is currently subject to. Al-Ahsa is the warmest region in Saudi Arabia and therefore would benefit enormously from the proposed greening and the accompanying extended canal network. These combined elements and their distribution are designed to create a cooler microclimate in the town centre that will make the streets and public spaces more accessible to pedestrian access and reduce dependence on the personal automobile. The reduction of car use in the town centre will additionally contribute to temperature reduction.

The proposal joins the agricultural fields with a network of green spaces, palms and shading trees that extend through the main mobility axis and disperse from there, to reach all areas of the city. Endogenous species should be prioritised for both the planting schemes and phytoremediation systems. The level of coverage proposed is directly related to climate and public value. Tree planting has been demonstrated as directly contributing to citizen happiness as well as preventing erosion through strengthened soils, reducing carbon emissions and lowering temperatures.

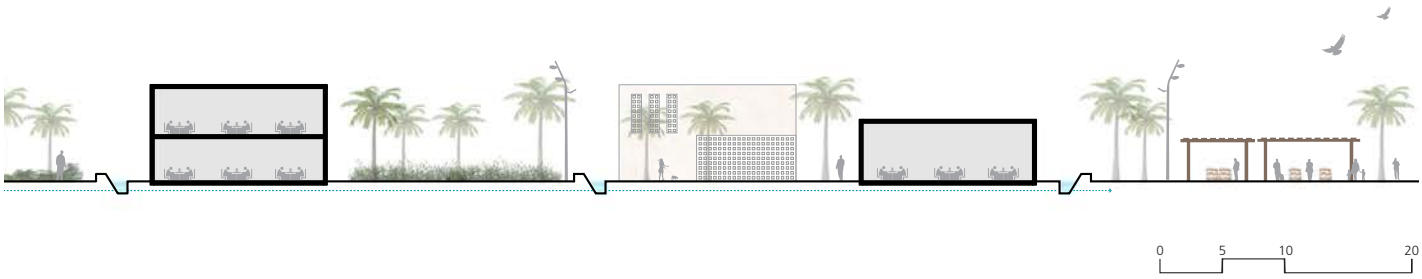
Fig. 37. Agro-innovation village section

Brassica napus

Cirsium vulgare

Fig. 38. Example of plants to be used for phytoremediation along the canals

Fig. 36. Detail plan zoom 2: Sports village



Phalaris arundinacea

Phalaris arundinacea feesey

Typha latifolia

Reed canary grass

Fig. 39. Detail plan zoom 3: Agro-innovation village

5.2.2 The extension of the water canals

Water forms an integral part of this proposal as a multi-functional element that can cool the city, form an attractive articulation of streetscapes, facilitate stormwater management, soften the city's border with its agricultural outskirts and provide an essential and efficient natural support to Al-Ahsa's agricultural production.

Joining the two sides of agricultural production on the outskirts of Al Hofuf is essential for this multi-functionality. Closing this loop would allow for water reuse through a closed loop filtration system that would reduce need for ground water consumption and guard against future water shortages.

This proposal suggests that the two sets of irrigation canals should connect at the drainage channel indicated on the plans on the western side and from there, flow south through the city. From this drainage channel, a series of filtration ponds are proposed to the southern side in the agricultural fields before the water flows through the city to reconnect with the irrigation channels through a second series of filtration ponds.

The filtration ponds are proposed to apply phytoremediation to the water supply system. Phytoremediation is a natural wastewater purification system that employs the natural digestion systems of marsh plants to purify water of organic waste substances, pathogenic bacteria, viruses and heavy metals. Phytodepuration plants capture oxygen from the atmosphere and transport it to the substrate around their roots, where aerobic bacteria live. The bacteria are subsequently able to degrade pollutants in the form of organic and inorganic substances. The plants, in turn, further absorb a portion of any organic substances dissolved in water and produced by the bacteria at their roots. This process is applicable to wastewater from civil, industrial and agricultural uses. Potential plants for use in this process include marsh plants, submerged oxygenating plants, floating plants and water lilies.

At an international level, phytoremediation plants are often utilised in engineered wetlands and can be used either as secondary treatment, ie as a real purification process, downstream of primary treatment centres or as tertiary treatments downstream of traditional purification plants whose output does not reach the purity levels imposed by legislation.

The closing of this loop will also allow for several additional functions to be introduced to the canal network. The proposal suggests that this loop can be used to facilitate stormwater management, directing excess water, through the additional channels to the farms and preventing flooding in the city. After the water is discharged from the first filtration ponds, the proposal suggests that canals should branch through the city, forming an urban canal network that will become an integral and attractive element of the streetscape. In addition to the aesthetic impact that this will create in the city, the surface water will absorb heat and contribute to an improved microclimate in Al Hofuf. Combined with an urban greening programme that can be fed by these canals, the currently oppressive heat in the area will be reduced, making the streets more comfortably accessible to pedestrians.

1. Horizontal submerged flow with Macrophytes
2. Local stone paving
3. Gripping mortar
4. Asphalt waterproofing membrane
5. Stormwater overflow control
6. Sewage infrastructure
7. Municipal water supply system

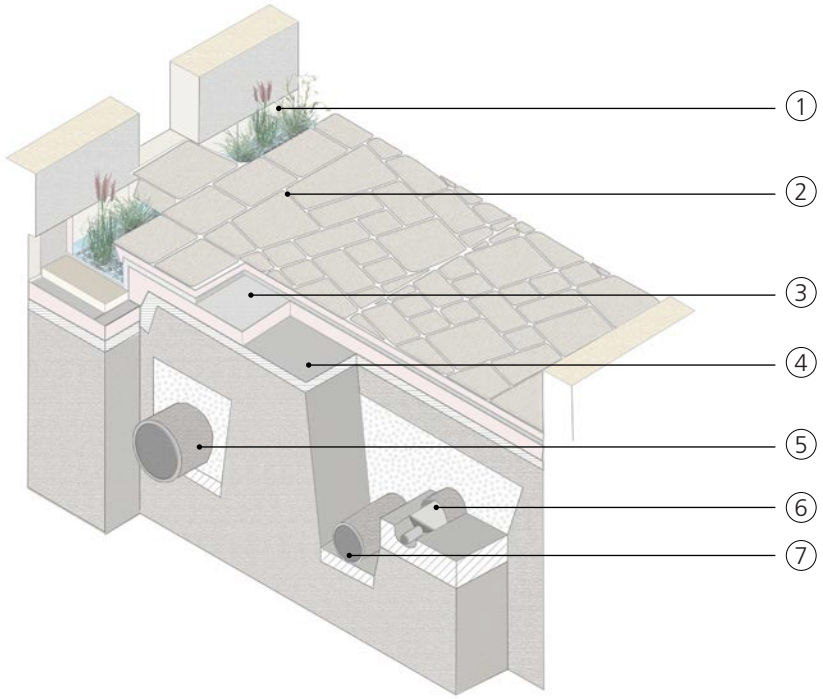
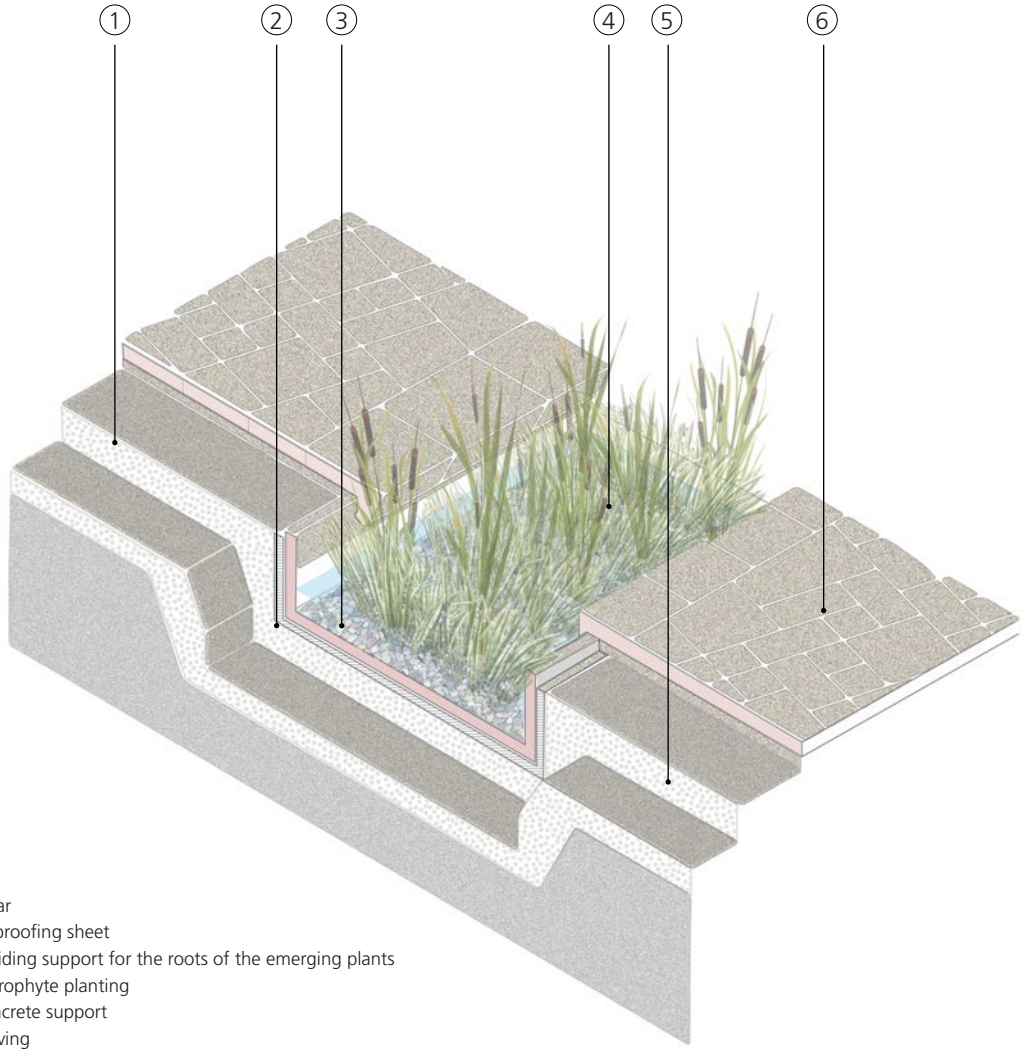


Fig. 40. Example of phytoremediation channel detail: narrow linear canals found within the historic fabric that use horizontal submerged flow technology. The detail is developed referring to Banyoles old town public space project (MIAS Architects / Tectonica 30)

The channels crossing the built fabric define an artificially-created landscape that mimics a functional ecosystem while enhancing Al-Ahsa's structural elements: the historic fabric, the greenery, and the water-channels system. This artificial ecosystem operates like a sieve by using sediments and vegetation that break down toxic substances. Unlike a naturally-occurring wetland, these landscapes use specific sediments and plants that optimize conditions for desirable microorganisms, deter bugs and odorous bacteria, and recirculate clean water into the overall channels-system.



1. Gripping mortar
2. Asphalt waterproofing sheet
3. Substrate providing support for the roots of the emerging plants
4. Emerging Macrophyte planting
5. Reinforced concrete support
6. Local stone paving

Fig. 41. Example of phytoremediation channel detail: larger water features found in main public spaces that use surface flow technology. The detail is developed referring to Banyoles old town public space project (MIAS Architects / Tectonica 30)

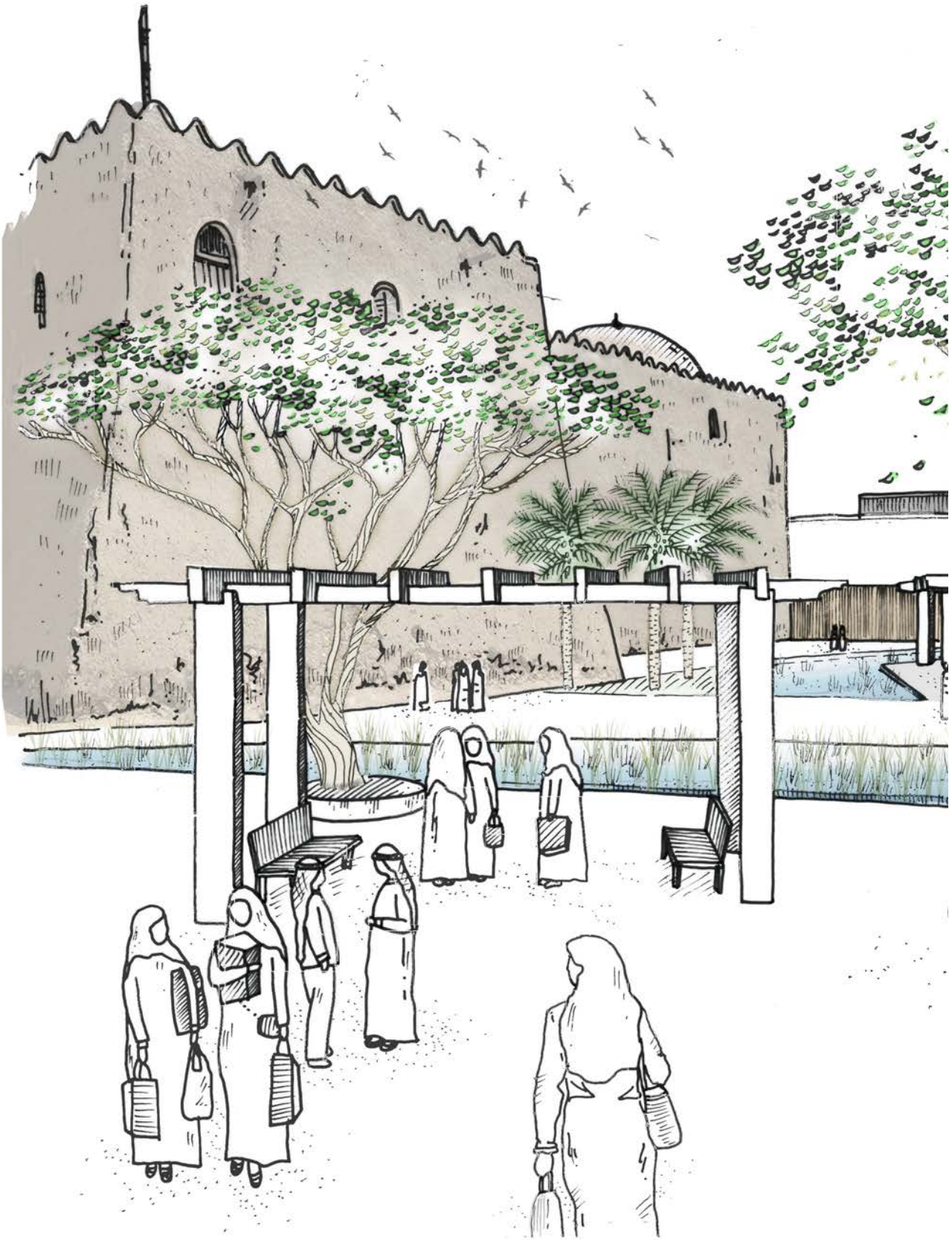
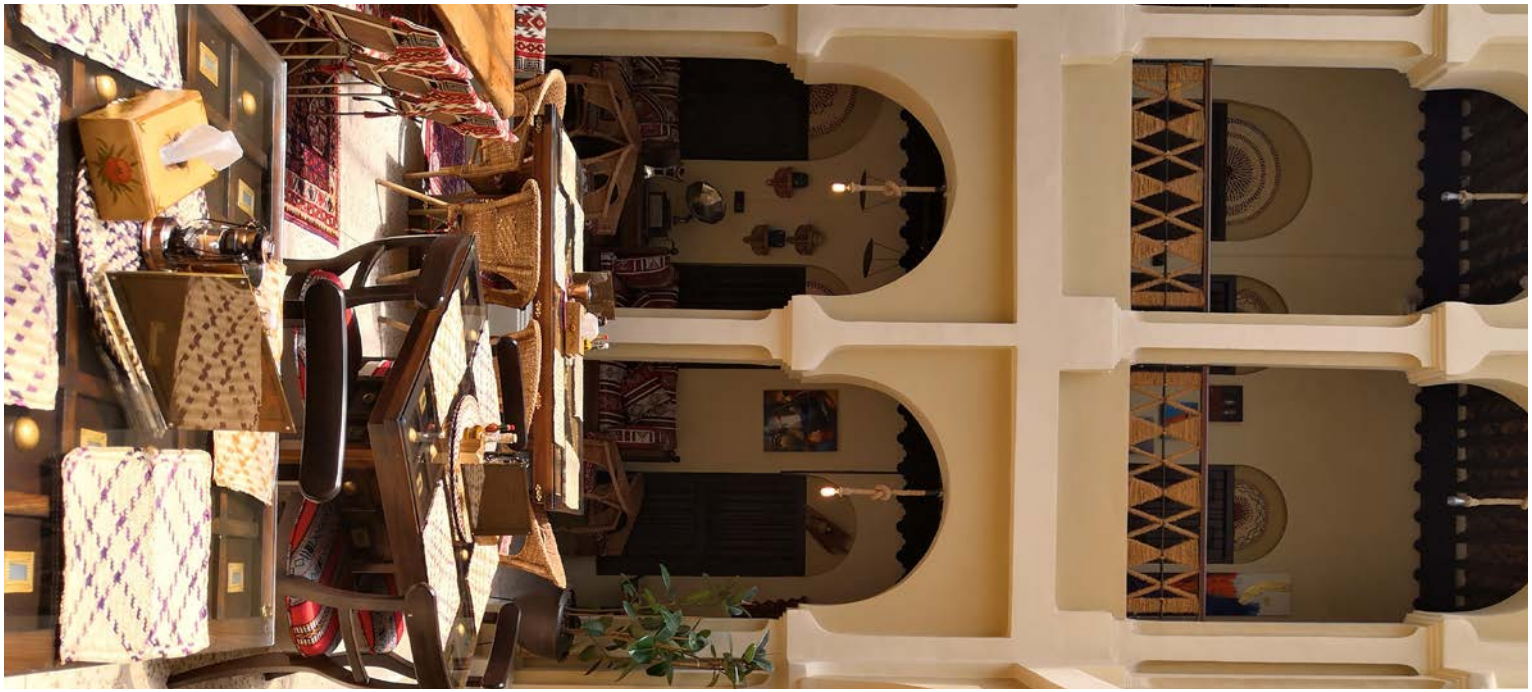


Fig. 42. Concept sketch of the new public spaces

FINANCIAL FEASIBILITY ANALYSIS



6.1 Overview

The demonstration project developed by UN-Habitat for Al-Ahsa proposes integration and connection between the old town and agriculture areas (UNESCO site), and proposals for mixed-use developments based on international planning and design principles that promote sustainable, resilient and compact urbanisation. The analysis that follows investigates the economic and financial returns of UN-Habitat's proposal. This chapter tests the viability and potential impact of the Demonstration project scenarios by simulating the application of a series of assumptions and cost-recovery options that focus on alternative funding sources and potential private sector engagement through public-private partnerships (PPPs).[1]

PPPs are defined as "long-term contracts between a private party and a government entity, for provision of a public asset or service, in which the private party bears significant risk and management responsibility."[2] In order for PPPs to be successful, local government must be able to authorise and enforce such contracts and the proposed project must offer a solid risk-adjusted return.[3] Private sector returns in PPPs may take a number of different forms such as revenue collected through betterment levies, user fees, and property tax.

The analysis gives evidence that demonstrates the project's potential to generate further own-source revenue, supporting local Government to increase local budgets as indicated by the National Transformation Programme 2020 (NTP).[4]

6.2 Methodology

While the cost-recovery target population for the demonstration project is largely comprised of residents, the local demand for tourism, commercial and leisure activities are also included. The cost recovery strategy deployed is determined as a factor of the target population as indicated in Figure 43. Strategies orientated around public space, tourism, retail, business, and services have been determined as better suited to the resident population. The private returns to investment calculated in this analysis make use of the aggregate definition of the resident population, which includes both permanent and transient residents. Population estimates provided by UN-Habitat, have been used to estimate the permanent population and to provide a more detailed disaggregated analysis of the resident population and consumer population.

The first evaluation (Figure 43) provides a market estimate that is intended as a foundation for the financial analysis and project capacity, specifically revenue generation potential from land value capture mechanisms, property tax, and parking fees. Figure 44 also provides a summary of the assumptions included in the analysis, focusing on four main points: land, business landscape, and infrastructure capacity.

The feasibility analysis provided below highlights five categories: tourism attractions, residential, commercial and office, and public space.

	Target markets	Recommendations
Tourist attractions	Local market: households and individuals Secondary demand: Saudi and GCC visitors	Highly visible and accessible with international standard
Residential	Local market: households, individuals and entrepreneurs	Differentiate residential options, services and facilities offered in order to attract different market segments
Commercial and Office	Primary demand: residents, office tenants, visitors Secondary demand: neighbouring office buildings, visitors in the vicinity	Differentiate commercial and office options. Highly visible and accessible area with internationally recognized brands and anchored attractions, restaurants and coffee shops
Public space	Primary demand: residents, office tenants, visitors Secondary demand: neighbouring office buildings, visitors in the vicinity	Highly visible, well maintained and accessible area with family facilities, playgrounds and coffee shops

Source: United Nations Human Settlements Programme, Nairobi (2018).

Fig. 43. Target market recommendations

Assumptions & Benchmarks	
Total target area (ha)	**42.6 ha**
Inhabitants (following 150p/ha UN)	3,500 People
Public transportation composed by 3 stations	1.6 Km
Area details	**Sqm**
Residential	111,298
Office	37,100
Commercial	37,100
Public space	141,478
Public Facilities	14,350
Public Parking (1,689 slots)	21,120
Private Parking (1,879 slots)	23,491

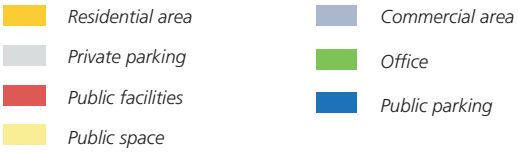
Source: United Nations Human Settlements Programme, Nairobi (2018).

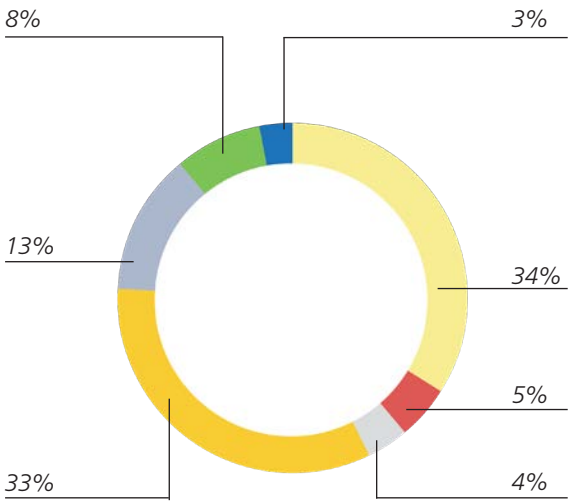
Fig. 44. Baseline assumptions

6.3 Capital Investment

Capital investment is provided in the section that follows. The estimations are based on preliminary local data, and should, therefore, serve as a rough estimate of the demonstration project's costs.[5]

Preliminary analysis estimates total investment at approximately SAR 540 million. This includes construction of public space (34 percent), public facilities (5 percent), residential areas (33 percent), commercial areas (13 percent), offices (8 percent), public parking (3 percent), and private parking (4 percent).





Source: United Nations Human Settlements Programme, Nairobi (2018).

Fig. 45. Capital investment breakdown

6.4 Private and Public Sector Finance

A central assumption of the demonstration project simulation is that the private sector assumes partial responsibility of the project financing, including all real estate components. The public sector is responsible for providing land where developments will occur. The public sector will fund public space, public facilities and a proportion of the parking area, for the purposes of beautification.

The preliminary evaluation estimates capital costs for the private sector at approximately SAR 317 million, of which a large share would be allocated to construction of residential apartments (1,445 units), offices (252 units), commercial activities (297 units with an average size established according to market research), and private parking (1,879 parking slots).

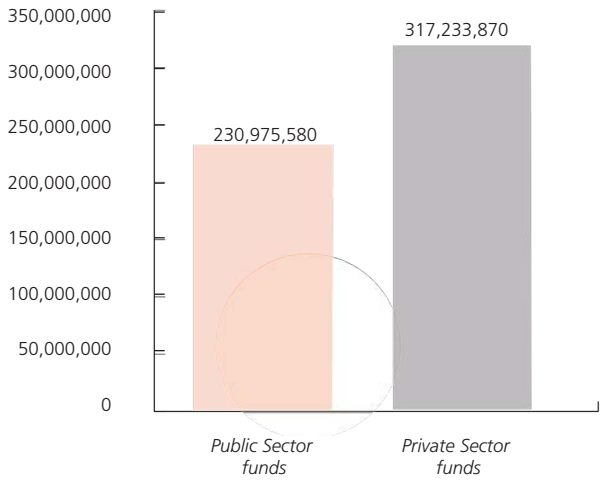
The core investments from the private sector are related to residential activities, followed by commercial. Therefore, project returns for private investors are subject to the real estate market dynamics and local prices.

The commercial typologies are estimated based on a market investigation conducted in the Kingdom, by which we identify five categories of commercial activities and their related dimensions. These categories are identified in accordance with a strategy to implement attractive business and anchored facilities for different market segments.[6] It estimates that 297 new business activities can be implemented within the project area. Figure 49 shows the categories of commercial activity proposed.

The project benefits and long-term financial feasibility are based on revenue generation estimates from residential, office and commercial properties. The financial feasibility of the demonstration project is calculated based on international and local data for the three types of proposed land use (residential, commercial and office) and the project impacts are calculated using benchmarks extracted from case studies and international practices.[7]

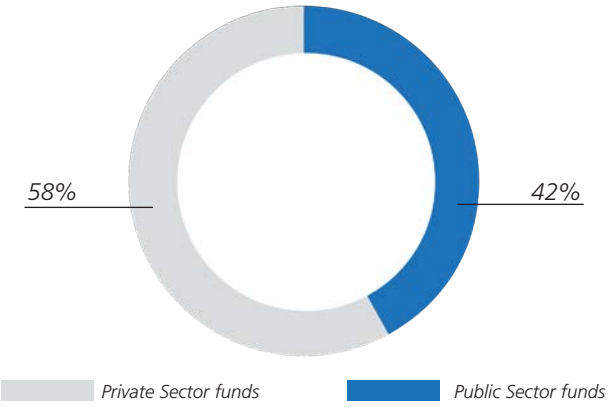
The demonstration project aims to provide guidance on urban development strategies, attract investment in the local real estate market, tourism and services, and show the value of sustainable urbanisation through collaboration with the private sector (PPPs). [8]

Figure 48 shows the baseline assumptions used to estimate the economic returns for residential and commercial land use.



Source: United Nations Human Settlements Programme, Nairobi (2018).

Fig. 46. Private and public project funds



Source: United Nations Human Settlements Programme, Nairobi (2018).

Fig. 47. Private and Public project funds breakdown

Local Benchmarks & Assumptions	
Residential	
Average land value (SAR/sqm)	SAR 320-380 per sqm
Commercial and Office	
Average monthly rent fees (SAR)	SAR >4,000 per month

Source: United Nations Human Settlements Programme, Nairobi (2018).

Fig. 48. Benchmarks for real estate analysis in Al-Ahsa

Total commercial area	Average dimension
Retail, Anchor Restaurants	325
Retail Market, Coffee Shops	160
Accessory shops, service retail	100
Gyms, Potential Anchors & Facilities	2,250
Others	70

Source: United Nations Human Settlements Programme, Nairobi (2018).

Fig. 49. Commercial activities proposed

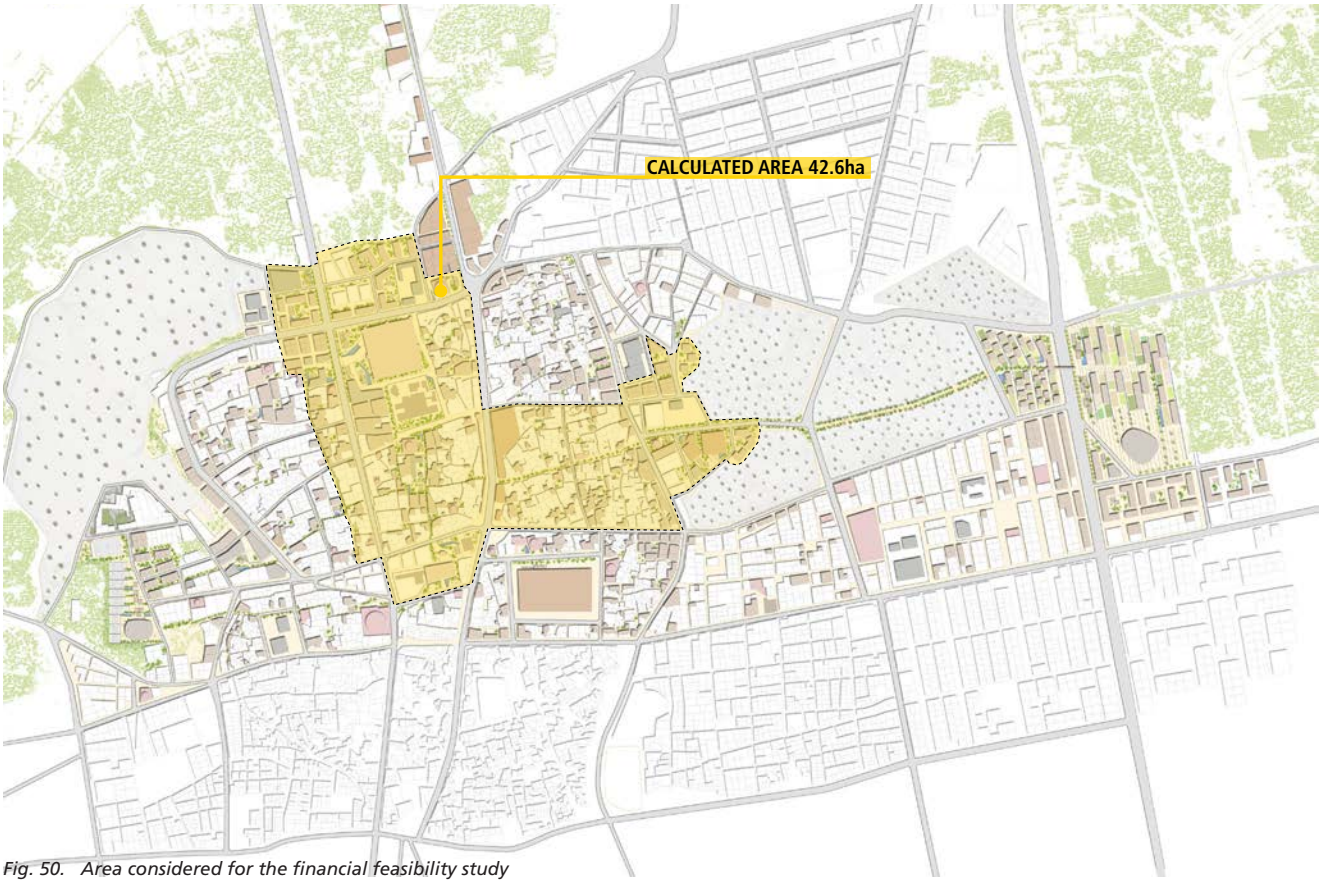
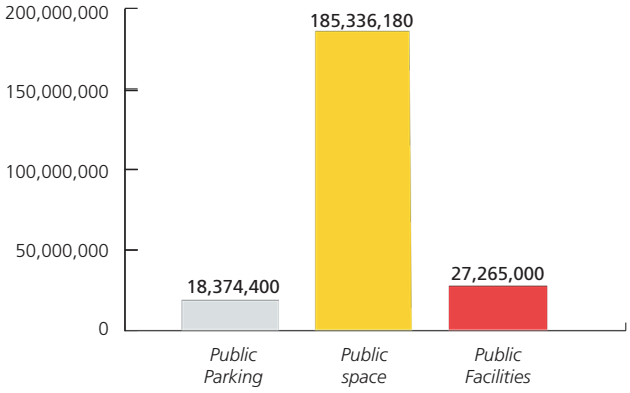


Fig. 50. Area considered for the financial feasibility study

6.5 Financial Instruments for the Public Sector

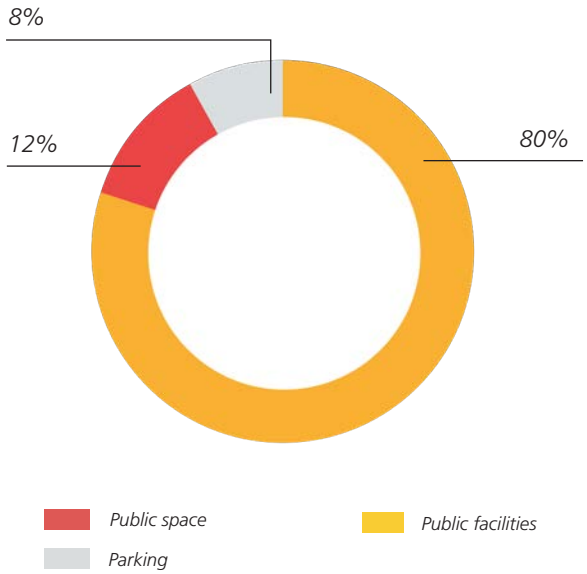
6.5.1 Public sector financing

As stated above, the feasibility analysis of the demonstration project incorporates various UN-Habitat planning and economic recommendations orientated around sustainable, resilient, and compact urbanisation.[9] The success of the demonstration project ultimately depends on the ability of the municipal authorities to mobilise own-source revenues through a number of financial instruments. This section examines the viability of the demonstration project in relation to the assumed role of the public sector.



Source: United Nations Human Settlements Programme, Nairobi (2018).

Fig. 51. Public project finance



Source: United Nations Human Settlements Programme, Nairobi (2018).

Fig. 52. Project finance breakdown for the public sector

In this scenario, key infrastructure and facilities (i.e. public parking, public spaces, public facilities) are financed by the public sector. Figures 51 and 52 show the project investment details for the public sector.[10]

While the private sector may benefit from real estate instruments to recover investments, the public sector does not currently have fiscal instruments capable of collecting sufficient revenue for the development of such a project. For this reason, a financial feasibility analysis was implemented to test different tax instruments that would improve the public sector's ability to generate own-source revenue for the annual budget. The tax instruments explored our analysis are (1) betterment levies, (2) parking fees, and (3) property taxes.[11]

6.5.2 Revenue generating tax instruments for municipal governments

a) Betterment levies

Typically, a government imposes a betterment levy on the owners of certain properties.[12] "It is used to either entirely or partially fund the cost of a specific improvement or service that benefits the public (generally) and confers a special benefit upon the owners of certain properties."[13]

According to international experiences, investments in mixed land use that include public facilities (schools, health), walkable areas and public space, and commercial areas can increase land values by up to 13 percent, 9 percent, and 17 percent respectively. [14]

Figure 53 gives evidence on case study benchmarks.

Our analysis ran three simulations (low, medium, high) based on international experiences with betterment levies, in order to estimate the potential land value increase in Al-Ahsa that may occur as a result of the demonstration project. [15]

In order to accurately estimate the impact of the demonstration project on surrounding properties, additional micro-level data and investigations are required. However, the simulations in our analysis provide preliminary land value estimates (Figure 55).

The potential land value increase is calculated based on three targeted scenarios (Figure 55). These calculations draw on the data collected in Al-Ahsa on the local real estate market.

Case Examples	Key Findings
Dubai, United Arab Emirates; Cairo, Egypt	Urban development that included retail facilities resulted in a price premium of 15 – 20 percent Schools increased residential land prices by approximately 13 percent Walkability within a residential community increases home values by u pto 9 percent

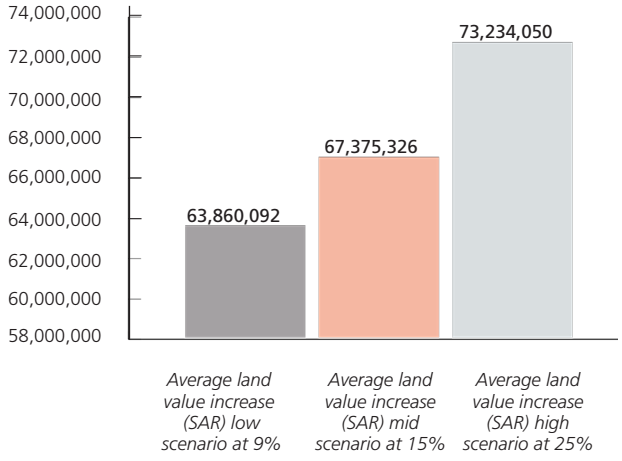
Source: Colliers International (2017)

Fig. 53. The impact of infrastructure development and planning on land value

	Benchmarks & Assumptions
Low Scenario	Percentage of land value increase – 9%
Mid-Scenario	Percentage of land value increase – 15%
High Scenario	Percentage of land value increase – 25%

Source: United Nations Human Settlements Programme, Nairobi (2018).

Fig. 54. Benchmarks & assumptions for betterment levies analysis



Source: United Nations Human Settlements Programme, Nairobi (2018).

Fig. 55. Impact on land value generated by the project

In the "high" scenario, an estimated SAR 26.8 million in revenue was generated by betterment levies. In this simulation, the betterment levy is imposed once and the revenue collected might be used to cover part of the cost for parking, facilities maintenance and other costs. In this projection, betterment levies (SAR 13,445 including residential and commercial units) on real estate (1,994 units) proposed in the demonstration project are included in the revenue estimate.

Our analysis suggests that betterment levies are a viable option for cost recovery and for other project operating costs in Al-Asha. However, as betterment levies are not recurrent, they are more appropriate to mobilise stable, reliable, and multiannual revenue flows for local budgets.

It is important to note that revenue from neighbouring properties that could potentially benefit from the proposed infrastructure projects were not included in our analysis due to a lack of information and data.[16] As a result, our projections likely represent lower bound estimates.

b) Parking fees

User fees can provide a long-term source of revenue for municipal governments. In the case of Al-Ahsa, parking fees are well suited to the development proposed in the demonstration project, which includes 3,568 parking slots,[17] of which 1,689 are public. Figure 55 shows that 1,689 public parking slots would generate more than SAR 15 million in revenue per year. This represents 4 percent of the budget for Al-Ahsa.[18]

Although a more detailed analysis is required, these findings suggest that parking fees could provide a significant source of revenue for the city and highlight the importance of exploring this option further.[19]

Figure 56 provides the benchmarks for the analysis.

Benchmarks & Assumptions

Parking Slots	Fee / hour	Time zone	Total hours / day	Revenue one-slot / month	Revenue one-slot / year	Total Annual Revenue
1,689	SAR 2.00	8:00am - 7:00pm	12	SAR 744	SAR 8,928	**SAR 15,079,392**

Source: United Nations Human Settlements Programme, Nairobi (2018).

Fig. 56. Parking fees benchmarks and assumptions

c) Property taxes

Property taxes are the third option for own-source revenue generation that provide an alternative to betterment levies. To estimate the effect of property taxes in Saudi Arabia, international case studies (UN-Habitat 2016),[20] the Finance for City Leaders' Handbook (UN-Habitat 2016),[21] and common property tax regimes in emerging economies have been used to provide a baseline.[22]

Two tax rate options are considered that differentiate between commercial and residential properties.

- Property tax rate estimate for commercial property is 2.5 percent
- Property tax rate estimate for residential property is 1.75 percent

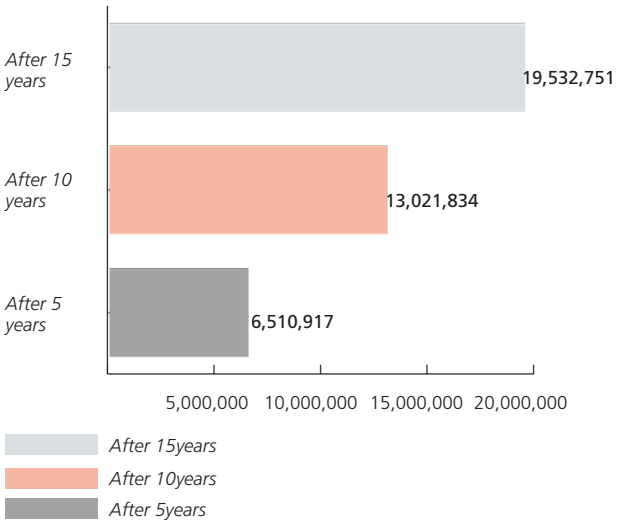
Property taxes are collected annually and are based on real estate value data collected in different cities in Saudi Arabia as benchmarks.

The annual revenue generated by new real estate development is estimated at approximately SAR 1.3 million in the High Scenario.[23] If this estimate were extended to include value increases to existing properties generated by project components such as public space, we may conclude that an additional approximation of SAR 3 million will be added to the annual revenue in property tax.

If we extent the project horizon over three milestones (5 years, 10 years, 15 years), the potential impact of property tax as a component of public finance system becomes increasingly evident (Figure 57).

It is important to emphasise the significant contribution to the financial sustainability of this project over the long-term that property taxes would generate.

The simulation for this analysis used the "low" property tax rate,[24] meaning revenue projections likely represent a lower-bound estimate.[25]



Source: United Nations Human Settlements Programme, Nairobi (2018).

Fig. 57. Property tax analysis and project horizon

6.6 Analysis of Financing Scenarios

Parking fees and property taxes would generate more than SAR 19 million annually, while betterment levies would form a secondary option, mobilising SAR 26.8 million only once to generate a portion of capital expenditures on public infrastructure.

Public-private sector collaboration through PPPs could provide crucial investments in tourism services and attractions, improving project finance efficiency over the long-term.[26] In addition to PPPs, the estimates produced from our financial feasibility analysis strongly support the use of betterment levies, parking fees, and property taxes. Additional fiscal instruments should be explored in order to fill any existing investment gaps. UN-Habitat recommends that Al-Ahsa continue exploring mechanisms that will strengthen their own-source revenue base.

6.7 Conclusion and Policy Recommendations

The policies recommended by UN-Habitat for implementation of the demonstration project are:

- Identify own-source revenue potential based on an approach that integrates urban planning, infrastructure development, urban economy and municipal finance.
- Foster a holistic approach. PPPs should be focused on linking infrastructure investment and land development, thus maximising benefits that correspond with mixed land use, in which the connection between the old town and agriculture area (UNESCO site) is a key asset.
- Estimate the impact of the demonstration project on land value, in order to estimate revenue generated by land value capture mechanisms.
- Generate a diverse income-stream portfolio, implementing different fiscal instruments[27]
- Invest to implement diagnostic tools for land information, monitoring systems (e.g., fiscal cadastre) and data collection[28]

The preliminary findings provided in this chapter support the use of land taxes and user fees as part of the core municipal budget in the Kingdom of Saudi Arabia. The introduction of the tax instruments explored in this chapter would contribute significantly to improving local government capacity and, ultimately, achieving the goals set in the National Transformation Program 2020 (NTP).[29]

Boutique hotel in the historic centre

7

ANNEX

7.1 Picture Credits

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7.3 Notes and References

1 Although, Saudi Arabia development policy is oriented to use PPPs for strategic projects at large scale, using Built-Operate-Transfer and other type of agreements (e.g. Prince Mohammad Bin Adbulaziz International Airport, privatization of the operation and maintenance of the King Fahd International Airport of Dammam, Taif international airport), the Demo project gives evidence on the potential returns for urban project at small scale

2 United Nations Human Settlements Programme. (2016). Finance for City Leaders, p. 100, Nairobi, Kenya.

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16 Colliers International. (2017). The Impact of Social Infrastructure on Mixed Use Developments;

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18 The Al Ahsa's collected own-source revenue is SAR 126,350,000. Approved 2016 Budget for Al Ahsa, Ministry of Finance, The Kingdom of Saudi Arabia

19 To monitor the land value impact new instrument (e.g. fiscal cadastre) will be highly recommended. Ruiz Francisco, Vallejo Gabriel. (2010). Using land registration as a tool to generate municipal revenue: Lessons from Bogota. The World Bank, Washington, DC

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21 United Nations Human Settlements Programme. (2016). Finance for City Leaders, Nairobi, Kenya

22 United Nations Human Settlements Programme. (2013). Property Tax Regimes in East Africa, Nairobi, Kenya.

23 The simulation takes account for low rates in order to give evidence on the potential impacts of this financial sources. International Federation of Surveyors. (2016). Property Taxation for Developing Economies. FIG Publication no. 67

24 In Singapore, for example, the effective property tax rate is 5.00 percent for owned property and 11.00 percent rented property in 2015 (UN-Habitat. (2016). Leveraging land: land-based finance for local governments. United Nations Human Settlements Programme. Nairobi, Kenya.)

25 International Federation of Surveyors. (2016). Property Taxation for Developing Economies. FIG Publication no. 67

26 National Center for Privatization. (2018). The Privatization Project Manual. The Kingdom of Saudi Arabia

27 United Nations. (2017). New Urban Agenda. United Nations Human Settlements Programme, Nairobi, Kenya.

28 Between 2009 and 2010, Bogotá, Colombia's cadastral office began valuing all urban property following the adoption of several administrative reforms. The valuation revealed an increase in the city's cadastral value by 47 percent. The property valuation process cost USD $7.8 million and generated USD $171 million in property tax revenue for the city. Ruiz, F., & Vallejo, G. (2010). Using land registration as a tool to generate municipal revenue: lessons from Bogota. World Bank, Washington, DC.

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