



مؤسسة محمد السادس لحماية البيئة

FONDATION MOHAMMED VI
POUR LA PROTECTION DE L'ENVIRONNEMENT

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The Palm Grove of Marrakech

SAFEGUARD AND DEVELOPMENT PROGRAM



regenerate



irrigate



“ The Marrakech palm grove is an emblematic, renowned site which gives the city its special character. Its condition, however, is deteriorating steadily, despite the efforts made to protect it. This is due to the combined effect of drought, growing human activity, ageing palm trees and lack of maintenance and reforestation. To address this situation, the Foundation has been asked to draw up and implement a plan for the preservation and development of the Marrakech palm grove, in conjunction with all the institutions and stakeholders concerned. The objective is to restore and upgrade this site. Solutions include reforestation of the palm grove. ”

Excerpt from the letter address to attendees of the Marrakech Palm Grove Safeguard and Development Program launch ceremony by **Her Royal Highness Princess Lalla Hasnaa** on March 19, 2007, kicking-off the Program.



The Palm Grove of Marrakech is a testimony to our history and a treasure of our civilization. It is the expression of a remarkable tradition of hydraulics, and of the tireless and patient work of our farmers. Born nearly one thousand years ago. It has weathered the ages, gracing Marrakech with its benefits. It is our duty today, as it faces troubled times in its extensive history, to work towards its preservation.

Our Foundation, responding to the call of **His Majesty the King Mohammed VI**, is committed to doing so, supported by multiple stakeholders, so that our children can tomorrow still cool off under the lofty heads of the Palm Grove's date trees.



Her Royal Highness Princess Lalla Hasnaa



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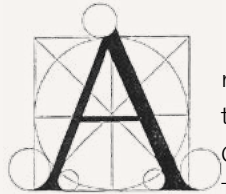
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The Palm Grove of Marrakech

An age-old legacy to preserve



An idyllic place. A postcard image. A thousand-year-old dream. The Palm Grove of Marrakech fascinates.

The XXI century might well have been the final stop for the oasis at northernmost tip of caravan routes crossing the Sahara Desert. The extraordinary ecosystem buckled under the weight of modernity. The city it nourished for nearly a thousand years gradually began to swallow it.

In the early twentieth century, the great avenues of the modern city were drawn beyond the city's walls, outlining the way for constructions to spread. Urban expansion inexorably encroached on the Palm Grove, and the Medina, once encompassed by lush green palm tree tops as far the eye could see, now encircled by nothing but

buildings and housing developments. The city embarked on a different destiny, other horizons, and the nurturing Palm Grove forsaken.

The warning bells went off early in the twentieth century. And sounded multiple times thereafter. The Palm Grove may well be the very identity of Marrakesh, yet the city appeared to have forgotten it, in a frenzy of urbanization. It took the full authority of **His Majesty King Mohammed VI**, taking up the problem, to finally stem the decay of this world heritage site.

In 2007, **HRH Princess Lalla Hasnaa**, Chair of the Mohammed VI Foundation for Environmental Protection, officially launched the program to safeguard and develop the Marrakech Palm Grove.



A Palm Grove undermined by multiple issues

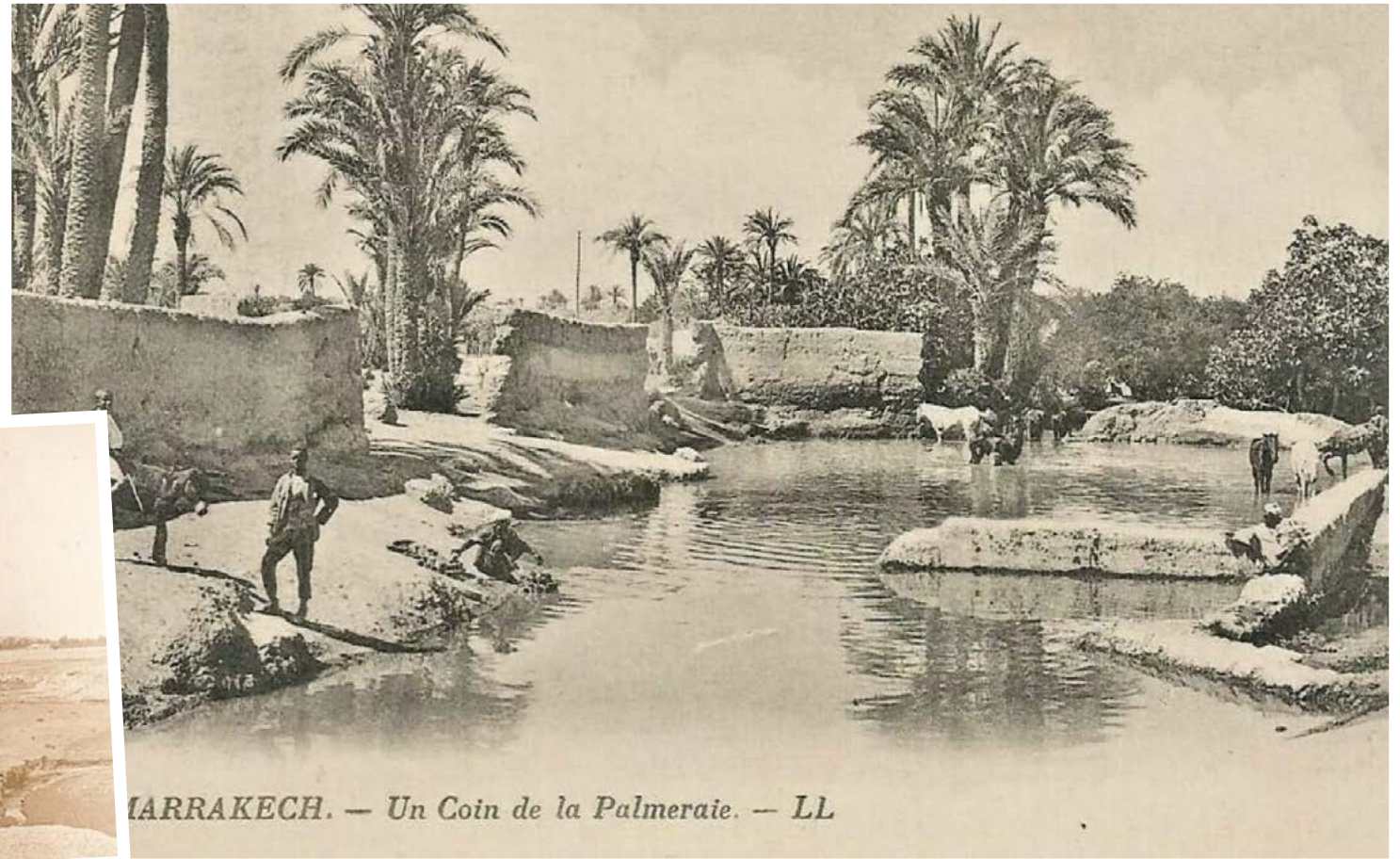
Listed for its scenic, cultural and historical significance in 1929 by Royal Dahir, and drawing its vitality from the Tensift wadi and a hydrographic system of extraordinary ingenuity, the Marrakech Palm Grove at the dawn of the 21st century suffered from:

- A slow disappearance of agriculture, in the wake of rural flight, as inhabitants moved to the nearby city.
- Aging abandoned plantations and absent rejuvenation.
- Increasing drought since the eighties, urban expansion eating away at its very fabric, and relentless urbanization.

Water, a fundamental factor

The genius of Arab hydraulic engineers enabled water to be brought down from the Atlas Mountains to Marrakech through a buried network of Khettaras. The desert steppe of Haouz was turned into a lush palm grove. The advent of modern pumping technology led intensive agriculture, thereby dooming small-scale but ecological oases. Without proper irrigation, the palm trees withered away.

A shrinking land mass
from ¹⁹²⁹12 000 to ²⁰⁰¹4 700
hectares hectares





One common legacy, One common mobilization

The Marrakech Palm Grove is a complex space, one that today blends urban fabric and agricultural spaces, local populations and new entrants, modernity and timeless traditions, so that only a comprehensive, multidisciplinary, and multidirectional effort can reverse its decline. The Safeguard program accordingly sought to cover all aspect of the problem, to significantly shape future developments. Five action areas were identified (see opposite), ranging from biodiversity to agroecology, with a significant, perhaps essential, emphasis on awareness and training. The Foundation, true to its usual operating philosophy, enlisted support from the widest range of stakeholders possible in rolling-out this program. The Foundation began working with the Urban Commune and the Wilaya of Marrakech-Safi in 2005, and signed an initial Framework Agreement for palm tree plantations in 2006. Since then, the Foundation forged partnerships with local, national, international, public and private actors to gather financial resources and capacities needed for project success.

25 partners mobilized

A major achievement of the program lies in enlisting the support of multiple partners over the long term. Each partner took on an active part of the broad program, and all truly committed to its' long-term success.

HRH Lalla Hasnaa, a committed Chair.

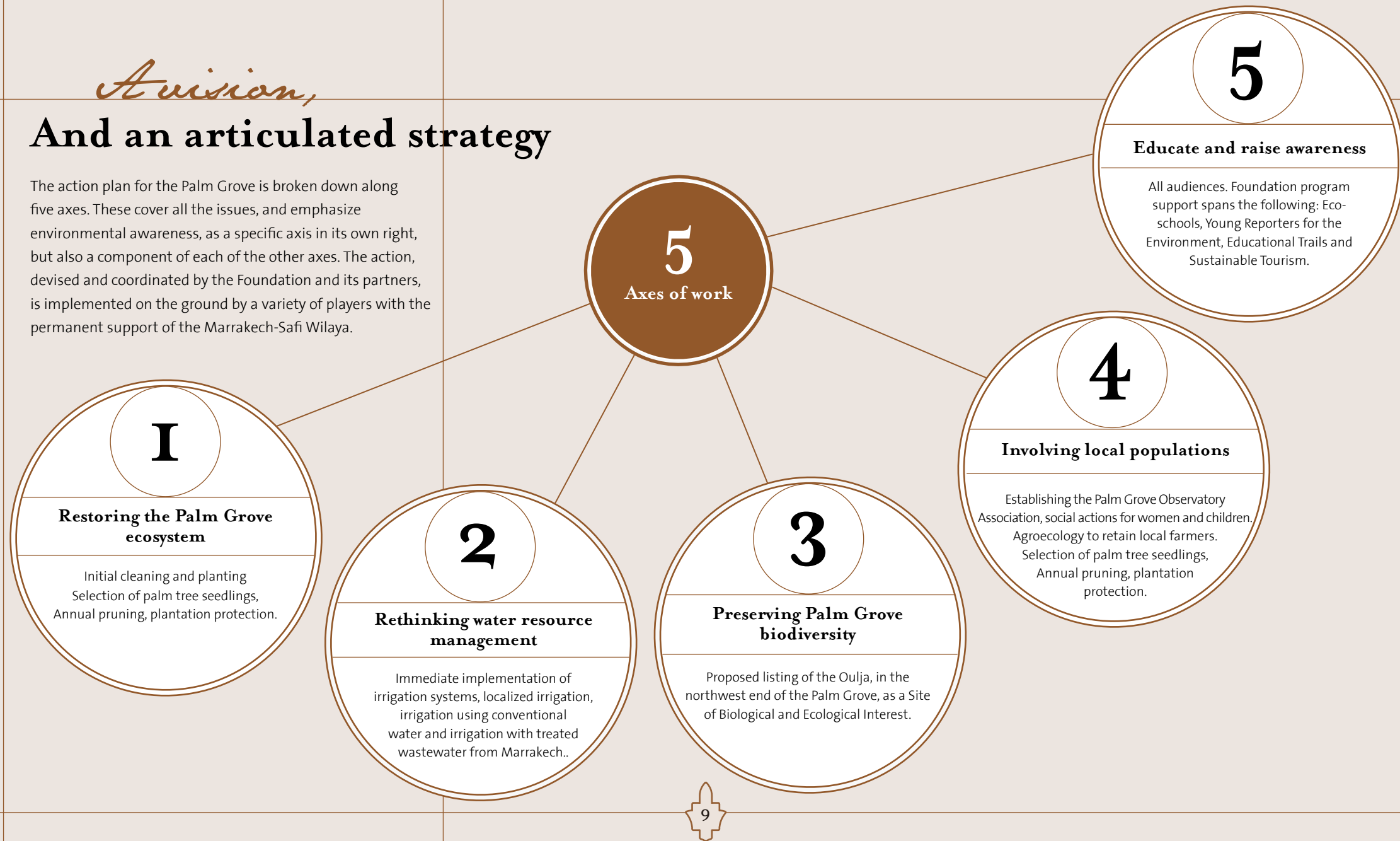
HRH Princess Lalla Hasnaa, Chair of the Mohammed VI Foundation for Environmental Protection, led the action on the ground since day one and conducted progress review meetings and inspection visits in March 2009, December 2011, April 2014, November 2016, October 2018.



A vision,

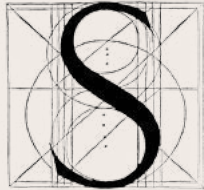
And an articulated strategy

The action plan for the Palm Grove is broken down along five axes. These cover all the issues, and emphasize environmental awareness, as a specific axis in its own right, but also a component of each of the other axes. The action, devised and coordinated by the Foundation and its partners, is implemented on the ground by a variety of players with the permanent support of the Marrakech-Safi Wilaya.





A program spanning spanning the many dimensions of the Palm Grove

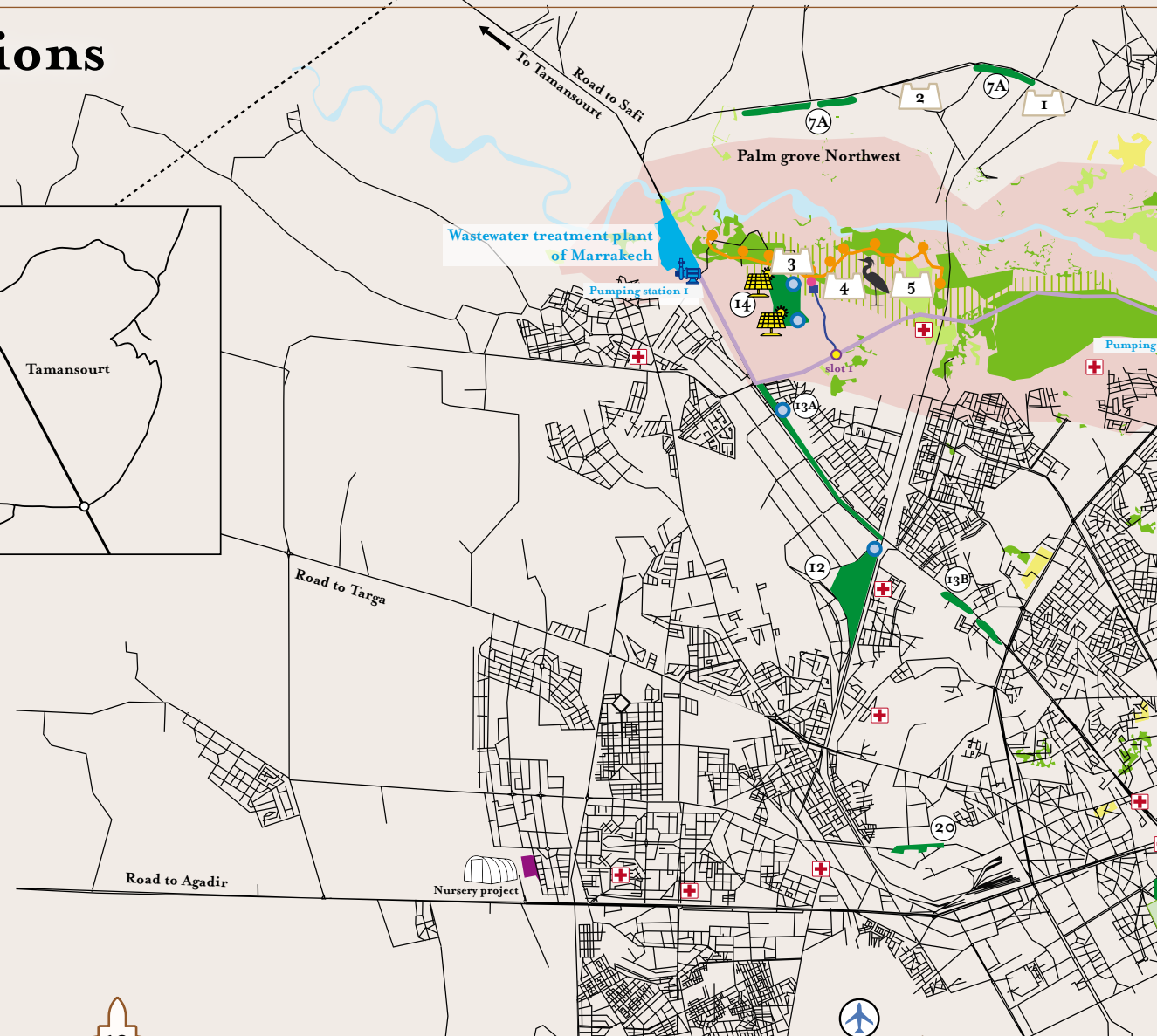
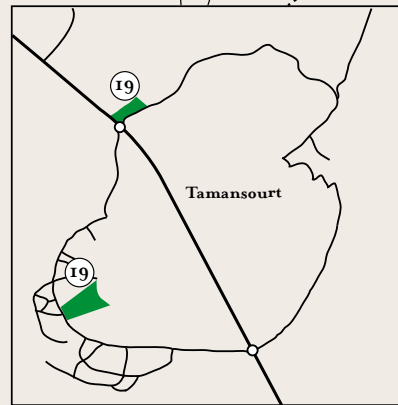


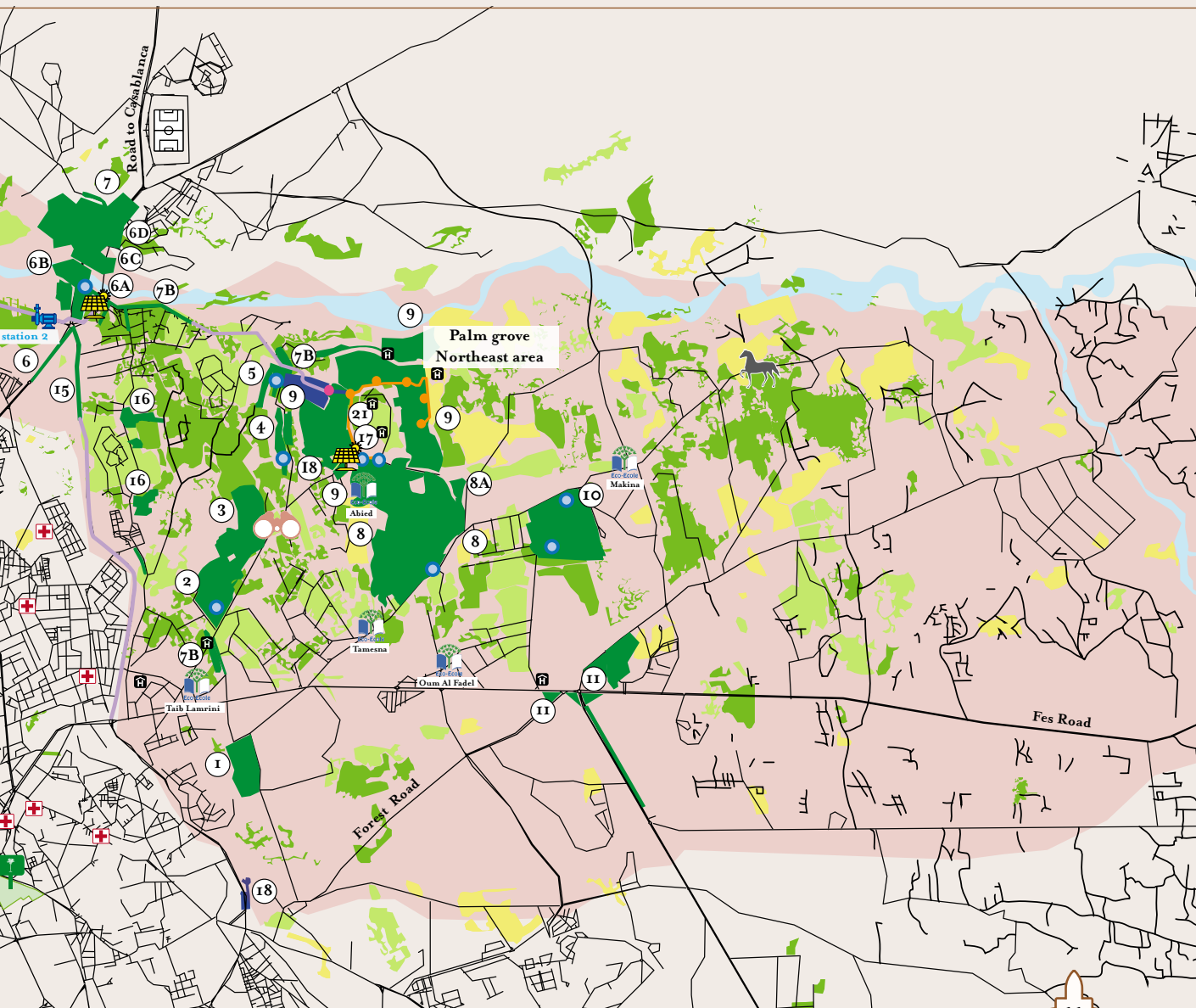
tretching from east to west, along the Oued Tensif, and beginning at the north of the Medina, the Palm Grove once covered over 12,000 hectares. The Foundation is committed to preserving the many different sections of this area,

which once was exclusively agricultural.

A detailed topographical survey enabled the identification and listing of these spaces according to density. The Foundation has, since 2007, endeavored to safeguard this mosaic where city and countryside today intertwine, according to the five axes mentioned above (p9).





A number of plots, often bare, have been replanted. Local populations that inhabit the area receive support, and school children are educated on the issues at hand. It is the Plam Grove's inhabitants who, by realizing the importance of this age-old treasure, are best able to protect and develop it.





regenerate

Areas covered by the palm grove

-  **High density zone** (Approximate area: 1,214 ha)
-  **Medium density zone** (approximate area: 639 ha)
-  **Low density zone** (approximate area: 423 ha)
-  **Palm tree seedling plantation area** (579 ha)

1. Jnane El Kabir
2. Jouihra
3. Chtatbi
4. Boulaadam
5. Master Zine
6. Road to Casa
- 6A. Road to Casa Habbous land
- 6B. Road to Casablanca Water and Forest authority lands
- 6C. Road to Casablanca Near the Tensift Bridge
- 6D. Road to Casa Dar Dmana
7. Entrance to Ouahat Sidi Brahimi
- 7A. Entrance to Jaâfaria Circuit
- 7B. Palm grove gardens trail
8. Jnane Tamesna
- 8A. El Majal
9. Abiad
10. Jnane Amesnaji
11. Road to Fez and Road to Ouarzazate
12. Road to Safi ONCF land
- 13A. Road to Safi Sidi Ghanem.
- 13B. Safi road near McDonald's
14. El Oulja
15. El Habib El Fourkani BD
16. Douar Guennoun trail
17. Dar Sbra
18. Cavalry Squad
19. Tamansourt
20. Al Moqaouama Road
21. Brigade Squad Habbous Field

protect



SBEI

Urbanization

sensibilisee



Eco-School

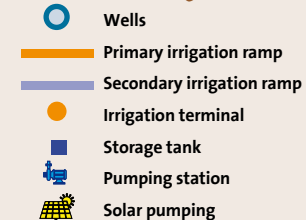


Arbat Moulay Abdesalam (Pedagogical trail)



A pedestrian circuit

irrigate



Wells

Primary irrigation ramp

Secondary irrigation ramp

Irrigation terminal

Storage tank

Pumping station

Solar pumping

include



Health Center

Palm Grove Observatory

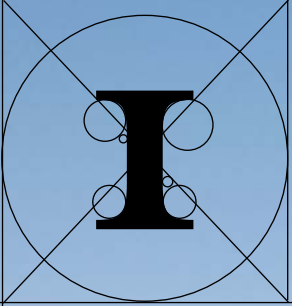
Cavalry Squad

Sustainable tourism hotel

Douar of the agroecology

Nursery project

1. Bellaguide
2. Ouled Chaouf
3. Chlailga
4. Sraghna Lkbir
5. Sraghna Sghir

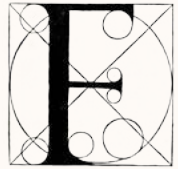


Restoring the ecosystem





Rehabilitating plantations, A genuine gardener's job



From atop a thirty-meter palm tree crown, it is over a century that gazes down upon us. Beneath, young palm trees, often from the same cluster, have started their patient ascent to the sky. The Palm Grove continuously regenerates itself, helped by the men who select the most productive shoots and ensure a proper balance between

male and female trees that bear the dates: one male tree for 100 female trees.

This painstaking work, which has spanned ten centuries, has waned. The Marrakech Palm Grove withers away for lack of upkeep. The protection program's first action was to halt this decline and restore the ecosystem. This action could, with thirty years of continued care and patience, reconstitute the original ecosystem: palms intermingled with thick Atlas pistachio trees (batoum in Arabic and ig in Berber), tamarisk trees where wadi waters run and bulrush where they stop, etc.

An aerial photo of the Palm Grove was taken in 2004, then a detailed topographical survey carried out in 2022. This made it possible to draw up an inventory of palm trees according to condition throughout the area, irrespective of land plot legal status, highlighting the importance of repopulating, cleaning and preserving the area.



A thorough clean-up



In the first year, fifteen thousand dead palms were cleared and over 50,000 adult palms cared for. And so the replanting process began.



Selecting the right varieties

This was not a matter of random replanting, but rather of selecting the best suited varieties. The world of date palms is a mosaic of varieties, from the original banks of the Tigris and Euphrates rivers to the valleys of Drâa and Tafilalet, where the renowned Mejhoul and Boufeggous grow.

In Marrakech, date palms do not enjoy such a flattering reputation. They most often produce dates that are a little dry and not very plump, locally known as ablouh, and which often end up as food for goats and sheep.

The program sought to improve the quality of dates by introducing date palms better suited for human consumption and the climate of Marrakech. The date palm is a highly demanding plant when it comes to heat. Without enough heat in the summer, dates will not ripen.

The National Institute of Agronomic Research in Marrakech and the Faculty of Science and Technology of Marrakech worked to improve the species of date palms to obtain appropriate and productive species. Varieties that are able to bear good yields in the Northern High Atlas, where the heat is less intense than on the southern slopes, were selected.

... multiplied

Crop multiplication began using three methods. Core sowing, the least reliable genetically, as it is impossible to determine which male plant pollen pollinated inflorescences. The plantation of female shoots, an ancestral method that ensures reproduction of original plant characteristics. A third method, updating the second one, is in vitro breeding, where plants are multiplied from fragments of leaves from selected shoots.

... in nurseries

Whatever the multiplication method, seedlings were grown in a large nursery set up very quickly by the municipality of Marrakech on a 15-hectare site, with an annual capacity of 80,000 to 100,000 seedlings. The nursery work was conducted ecologically from the outset. Natural compost is produced under a large shade canopy from plant waste supplied by the city and crushed on site, and patiently moistened to break it down. The stems are mycorrhized, i.e., a fungus is inoculated onto the roots, living there in symbiosis and capturing nitrogen from the atmosphere to facilitate the absorption of water and nutritive elements. Treated seedlings grow stronger, more resilient and have greater growth potential.

Thousands of palm tree seedlings

Planting is always rewarding. A palm tree can live up to 120 years. It is a legacy beyond one human's life. It is also a demanding job. On selected parcels, the ground surface must be prepared, sometimes cleaned of waste or rubble, dead palms removed, and countless planting holes dug. The work is done by hand, but also very quickly with an auger on a tractor, behind which workmen recruited by the National Promotion Department bustle about. The soil extracted is mixed with manure to fertilize it, put back in its hole, edges are formed to retain irrigation waters, and the plant, still very young, is placed at the center. All that is left to do is water and wait.



96,000

Tons of CO₂ captured over the lifetime of over.

Voluntary Carbon Offsetting, support program



The Mohammed VI Foundation for Environmental Protection's voluntary carbon Offsetting program enables organizations, companies and others, to compensate for greenhouse gas emissions they cannot reduce by financing carbon capture or greenhouse gas emission substitution projects, such as renewable energy.

This program was tied to the Marrakech Palm Grove protection program in 2009, enabling companies to offset emissions by planting 50,000 date palms. By the end of their life, i.e., a century, these palm trees will have captured around 8,000 tons of CO₂ equivalent.

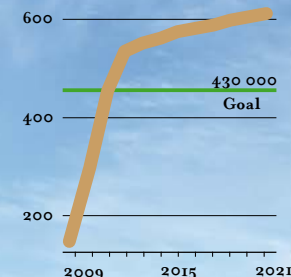
613 478

Palm trees planted

579

Hectares of palm grove reconstituted

Goal Surpassed

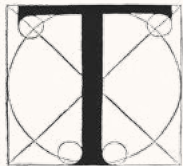




2

Managing Water

Water above all



he date palm is inseparable from water. Because it is resistant to drought, it is often believed to be frugal. But the date palm is thirsty. In Mesopotamia, where it originates, it was said three thousand

years ago that it grows with its head in the sun and its feet in the water. It is the iconic plant of oases, able to face the heat of the sun and protect the lower layers of fruit trees, cereals and fodder under the shade of its vigorous crown of palms, .

In Marrakech, it has always lived with its feet in the water, permanently refreshed by submerged irrigation systems, the khetaras. With roots that can go twelve meters deep and draw water directly from the groundwaters that emerge when you reach Oued Tensift.

But since the development of modern agriculture, abandoned khetaras, droughts and subsequent falling groundwaters, the palm trees no longer have water. They are drying up.



Irrigation of new plantings



Prior to receiving the first plantings, an irrigation system was set up on all the land available for the program.

Fifteen wells were built at the beginning of the program to provide local irrigation for the seedlings, initially using cisterns, before an underground network of pipes was put in place.



Mobilizing the sun for the palm trees



Two of the fifteen wells dug were equipped with photovoltaic solar panels to reduce fossil fuel consumption when pumping.



Irrigation with purified wastewater, a truly ecological project



umping water from the groundwater aquifers, although necessary at the outset, is not a sustainable solution, given the strain on Haouz plain water resources. It also compounds one of the causes behind the Palm Grove's decline: the exhaustion of traditional irrigation methods. The protection program therefore very early on envisaged a more ecological and innovative solution on a broader scale: irrigation using reprocessed wastewater from Marrakech.

The solution actually fell into the program's lap: A long, heavy pipeline bringing recycled water from the city's wastewater treatment plant to the golf courses west of Marrakech runs across nearly the entire length of the Palm Grove, from east to west. The idea of tapping into it came naturally. These waters are 90% purified. In other words, although still unsuitable for agriculture, they are suitable for the irrigation of gardens and golf courses, a solution implemented in 2013 so as not to overextend Haouz groundwaters. Date palms are highly resistant plants and adapt very well to high salinity purified water.

Two areas were selected for the project, launched with support from the Marrakech Autonomous Water and Electricity Board (RADEEMA).



Completed

Sector: North - West Palm Grove, Oulja

Implementation: 2014-2019

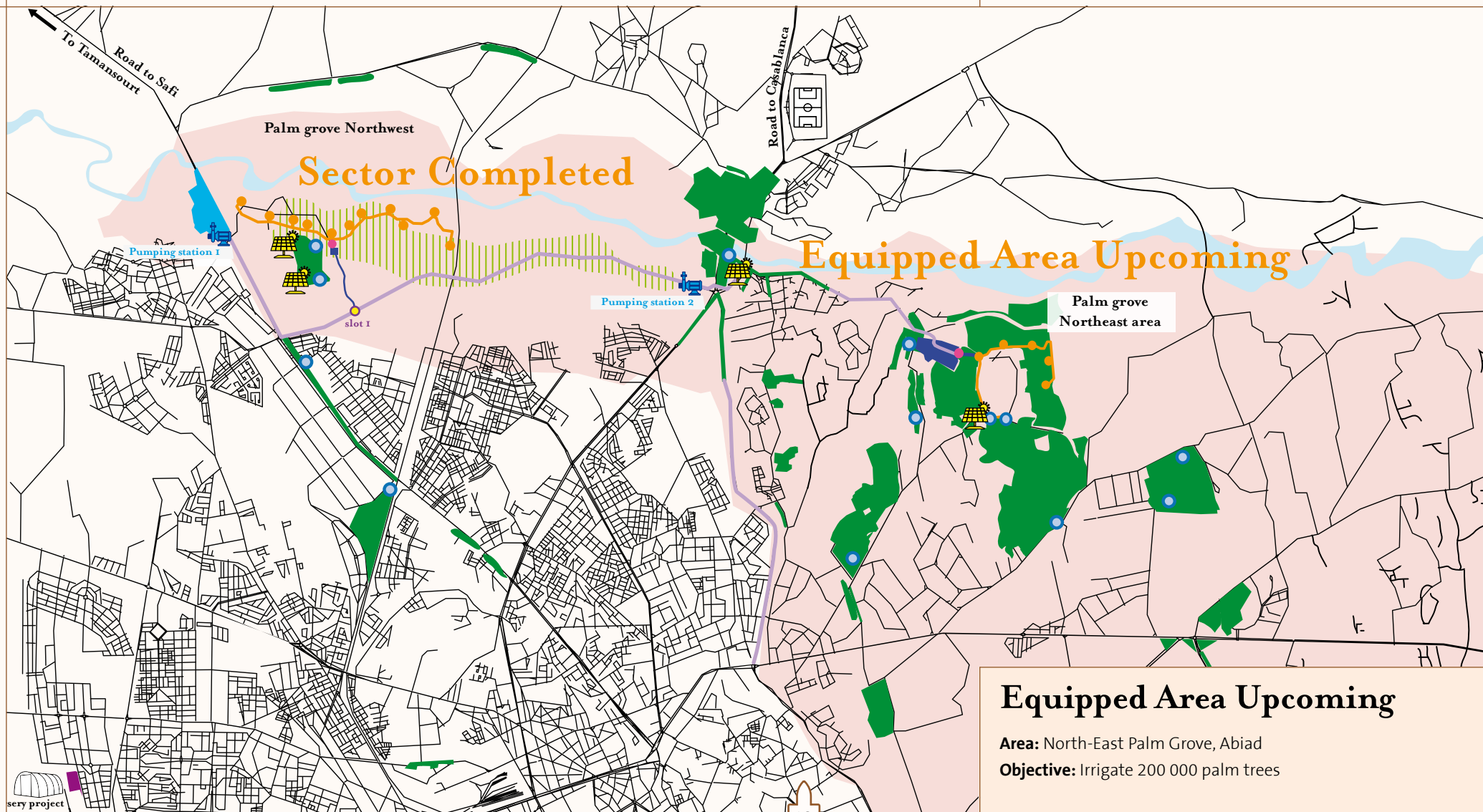
Surface: 280 ha

725 000 m³ annual usage estimate to preserve groundwaters

10 liters per palm tree

200,000 targeted palms

Storage basin: 1 500 m³





3

Preserving biodiversity

A site of biological and ecological interest in the Oulja of the Palm Grove



While the Palm Grove is entirely man-made, wild fauna and flora have spontaneously flocked to it onto it over centuries, creating a very rich biosphere in a number of places. These spaces receded in the twentieth century. But one remains in the northwestern part of the Palm Grove,

untouched by urbanization as it is marshland: the Oulja.

This area that has turned natural is at risk. From agricultural activity: overgrazing, clearing, drying up by pumping. Urbanization: soil and sand collection in the wadi, road construction projects, rubble dumping and pollution.

The Foundation and its partners have initiated the process of classifying this Site of Biological and Ecological Interest under Law 22-07 on protected areas which gives them very strong protection.

This classification would make it possible to sanctuary and protect the fauna and flora remarkable that it harbors: 15 species of mammals, including the rare mongoose, 24 species of reptiles and especially 49 species of birds, including some rare species such as the purple heron and the crab-eared ibis.

Notable Birds



14 species of interest, endemic, rare or under threat are present: purple heron, crab heron, falcinella ibis, marbled teal, white elanion, peregrine falcon, Baillon's Crake, white stilt, Levallant's green woodpecker, luscinioid locust and blackbird.



Notable Mammals



Three species of interest, endemic, rare or threatened are present: the shrew, the common genet, the mongoose ichneumon.



Endemic plants



The common tamarisk, the small-pointed buttercup, the common reed, the sedge distans, the salicornia, the arroche halime, the prickly rush, the suaeda fruticosa, the cylindrical imperata, Celery, atriplex coloei, frankenia corymbosa, horn plantain, limonium delicatulum, square-pod loosestrife, acute bulrush, divisa sedge, narrow-leaved club, cyperus distachyos, date palm, cyperus longus, heliosciadium nodiflorum.

Notable Reptiles



Sixteen species of interest, endemic, rare or threatened are presumably present:

The painted discoglossus, the Brongersma toad, the Moorish turtle, the Brosset saurodactyl, the common chameleon, the North African ocellated lizard, the Simon's eremias, the Atlas acanthodactyl, the Manuel's seps, the numerous-scaled seps, the Moroccan striated seps, the Moroccan orvet, the Mettetal amphisbene, the hooded snake.



4

Involve the populations of the palm grove



Involving and sensitizing resident populations

E

stablished at the same time as the city it feeds, the Palm Grove has always housed by humans. However, it was only recently, in the 20th century, that populations actually settled there, owing to rapid urban development. These populations, now settled at the very heart of the palm grove, are central

to the protection and development program. Retaining these populations who might be tempted by rural exodus, securing their livelihoods, making them aware of the importance of the ecosystem in which they live and work, is to make them valuable auxiliaries for safeguarding the Palm Grove.

Program initiatives target all social categories: from schoolchildren to the indispensable farmers and gardeners of this extraordinary space. Women, local residents, all were approached, supported and sensitized.



HRH Princess Lalla Hasnaa always takes the opportunity to meet with the local Palm Grove populations, e.g., the farmers of the agroecology project, in her visits to assess or inspect project progress.

October 2018



UNESCO green citizens for the Palm Grove



Alongside 100+ innovative projects from 56 countries, all living examples of environmental contribution, agroecology, awareness and support programs for local populations, featured in the exhibition, the program represented Morocco at the highest level. After traveling to 26 cities and attracting 2.3 million visitors, this was UNESCO's most visited exhibition to date.

The health center of Ain Itti refurbished

The health center in Ain Itti, south of the Palm Grove, was completely upgraded: fencing, cleaning, painting, landscaping and planting of palm trees and water-saving plants. The center received all the basic equipment necessary for its operations (blood pressure meter, thermometer, sugar level measurement, etc.) as well as consumables and basic medicine.



Establishing an Observatory of the Palm Grove

Setting up an Observatory of the Palm Grove stems from a simple idea: to make the people living at the heart of the Palm Grove the drivers and guardians of this space. The Observatory was created right from the start, in 2007.



Upgrading schools in the Palm Grove

Two out of eight schools in the Palm Grove were upgraded: Taieb Lemrini and Oum El Fadel. Upgrades were made in collaboration with the Observatory of the Marrakech Palm Grove and the support of Club Med, Ciments du Maroc, Club Tikida, and the Universities.



Bikes to get to school

The program distributed 814 bicycles in March 2012 and April 2015 to schoolchildren of the Palm Grove who live far from their schools.



Taieb Lemrini, Model Eco-School

The Taieb Lemrini Eco-School, which joined the Eco-School program in 2012, spared no effort to obtain this label of which it is now very proud.

Its action began with recycling gray waters from its sinks and turned into a beautiful ecological journey. The project involved the installation of an elaborate filtration system, with a basin, gravel, filtering plants and a pump, which then irrigated a garden of aromatic plants via pipes installed by the schoolchildren. The project also covered the buildings, with the upgrading of classrooms, amenities, photovoltaic kits for electricity, an insulated roof for the courtyard, roof waterproofing, ecological painting of the walls and earthworks at the entrance... The environmental awareness of the schoolchildren, enabled by the Eco-School program, now extends to the outside world, with children no longer shying away from taking action to save water at home or to confront those who squander water in public places.



Palm tree plantation and biodiversity

An abundant agricultural diversity

The Palm Grove is an area of diversified agricultural production. It provides dates for human and livestock consumption. A number of crops are grown beneath the palms: cereals, fodder, orange trees, almond trees, apricot trees, olive trees, vegetables, mint and aromatic plants... Local livestock feed on these crops. Palms are used in wickerwork (hats), basketry (baskets, dishes, and rope-making). Palm stipes [trunks] are used as beams in roof construction. Dried palms are also used as fuel for ovens and hammams.

But an activity under threat

This traditional approach agriculture could not withstand the competition from modern agriculture in the Haouz plain, and the disappearance of traditional irrigation waters. Above all, urbanization in the Palm Grove and the economic development of the city offered farmers and their offspring more remunerative alternatives.

Rehabilitating agriculture through agroecology

Helping farmers means helping the Palm Grove. It lives on the water crops bring to it, and without cultivation, palm trees are left to deteriorate.

The Palm Grove protection and development program chose to launch an agroecology program.

Agroecology differs from the pervasive intensive approach to agriculture; in that it respects natural balances. It considers that soil, plant cover, trees and plants, people, animals, fauna, biological, physical and climatic elements interact and create a virtuous balance that must be preserved and restored.

Agroecology seeks to reduce greenhouse gas emissions and limit the use of synthetic fertilizers and phytosanitary products as much as possible. It uses nature as a production factor and preserves its capacity for renewal. For the Palm Grove, this consists in combining crops with palm trees, favoring biodiversity and reconstituting ancestral and sustainable ecosystems.

A pilot project worth spreading

The agroecology project started in April 2015 with a long-term objective of convincing the greatest number of Palm Grove farmers to take it up, notably by improving incomes, and indeed encouraging those who have left to return to the land.

A survey identified four douars in the northwestern part of the Palm Grove where agriculture is still alive and provides a living for 200 families (Bellaguide, Ouled Chaouf, Sraghna Lkbir and Chlalga), and selected 49 family farms employing 379 people, i.e., 25% of the farming population of said douars.

The project sought to stabilize agricultural activities so as to sustain and convert farmers to agroecological practices, improve the marketability of agroecological crops, and train and sensitize farmers to the challenges of sustainable development. The pilot project was also intended to garner experience and produce and test training tools for roll-out throughout the Palm Grove.

Training that spans the full range of needs

The farmers learned new agricultural techniques for better, stronger, and more regular production from activities such as vegetable gardening, fruit growing, and cattle and sheep raising. They also learnt to manage their farms and market their products. Often, they learned to read with childlike enthusiasm, acquiring essential tools for maintaining their farm accounts. The women learnt to diversify their activity, producing beldi eggs.

MARKET GARDENER

Abdellatif Ahl El Fadel*Oulja*

I am a farmer in the Palm Grove Oulja. We used to do a little vegetable gardening and grew a few varieties of vegetables. With the project technicians advising us, we introduced new vegetables such as zucchini and cardoon. We learnt how to raise seedlings in the nursery. Results came and our situation started to change. We still need more guidance, for the pruning of trees and irrigation. We still practice surface irrigation and waste water. New techniques could help us save water, better maintain palm trees and protect the environment.



BREEDER

Lahcen El Hanba*Douar Ouled Chaouf*

I grow vegetables and alfalfa. I also raise dairy cows. Previously, I plowed and sowed with very little results. The project helped us with livestock breeding. It changed our practices, gave us advice that we now follow. Things are much better.

AGROECOLOGY
TRAINING

FARMER

Lekbir*Sghrana, Oulja*

Before the project, I practiced artisanal agriculture. The project enabled me to introduce new techniques. I learned how to manage greenhouses for better production. I learned techniques for animal rearing, tree pruning, and the best time to plant vegetables. We expect these new techniques to improve our income.



TRAINER

Mohammed Belcaïd*Marrakech*

My role is to coordinate ground team operations and to liaise with external partners. Whether it is AMEE, the Delegation of Agriculture, Water and Forests, all partners are 100% committed to the project. They provide us with technical support for success of the project.

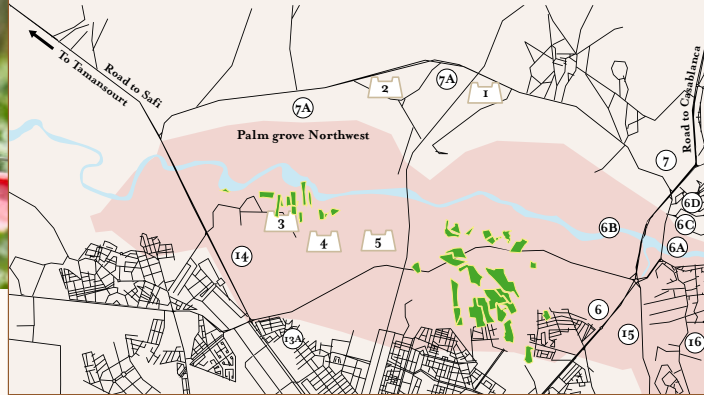




Encouraging results

For those 49 families trained in agroecology, tangible outcomes cement the success of the program. First, agroecology has won over 84 to 94% of farmers, depending on activity [vegetable gardening, arboriculture, animal husbandry], accounting for 100 ha of converted land. Yields have improved 30% and the 1050+ tons of fruit and vegetables produced are more varied, and sell at a better price, because they are produced in an agroecological way. Incomes rose by 50%. Above all, the project has empowered and included these farmers' families in the community. They have learnt to collaborate with local authorities and technical support services. They have shown real commitment by attending meetings and training sessions. Some of these farmers have become agents of change by contributing to raising the awareness of children in the Palm Grove Eco-Schools for the protection of this ecosystem.

The Palm Grove protection and Development Program has provided support to 49 families from five douars.



A cooperative to pool resources



The farmers have been carefully supervised from the outset of the project, which now works on empowering them. A cooperative was established in 2019 to eventually take over. 29 families have joined the "Guindo" cooperative, which produces and markets quality vegetables, fruits and eggs. Once the program is concluded, the cooperative will continue to provide its members with training, technical support, equipment, input supplies, and the collection and sale of products.

FARMER



Khamssi

President of the Guindo Cooperative



"All farmers in the agroecology project responded when we began operations. All of us have been working towards a common goal. We have assimilated the agroecology lessons taught to us. We use manure, do not apply chemicals, and produce vegetables that sell for a little more to hotels in the city. Our co-op started in 2019, and we had to deal with Covid-19. Today, we start again with the willingness to overcome our problems. We need support, especially as water becomes scarcer."

Capitalizing on methods and tools

Training kits for vegetable gardening, animal husbandry and arboriculture were developed to promote farmer autonomy, along with fact sheets on crops and agroecological practices for vegetables, arboriculture and animal husbandry.



Learning to read and count

The agroecology project also provided literacy courses for farmer families. Both women and men attended these courses, enabling them to acquire the basics of reading and arithmetic. And it is not without pride that these farmers and their wives, who were once illiterate, now keep their farm accounts. Literacy courses have not only tangibly benefited their activity, but have also provided considerable social progress for these disadvantaged individuals.

From Garden to Plate

Shorter distribution channels



Connecting with hotels

The Foundation, which has helped many hotels in Marrakech obtain the Green Key ecolabel for tourism, has put farmers and hoteliers, producers and consumers in contact with each other along a short and direct distribution channel. More than a dozen hotels have become regular customers.

Guindo-mets, a competition designed to inspire

In order to stimulate farmers, promote their work, and also raise awareness among restaurant and hotel owners in Marrakech of the importance of using healthy products, the program organized a culinary competition entitled Guindo-mets, after the place hosting it. Four teams of students from Marrakech's hotel schools competed under the watchful eye of three of the city's chefs. They were asked to prepare two recipes, one using cardoon, a traditional vegetable from the Palm Grove, and the other using round radish, a recently introduced vegetable.

Raising awareness among future chefs

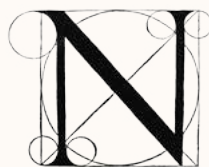
Hospitality school students were made aware of eco-responsible production methods. Responsible production using Guindo cooperative farmers as an example and responsible consumption: seasonal products, short distribution channels, pesticide-free products, support for family farming.

5

Educate and aware



Anchoring the protection of the Palm Grove in people's consciousness



o environmental protection action is ever effective unless it is supported by awareness and education. This is the credo of **HRH Princess Lalla Hasnaa**, Chair of the Mohammed VI Foundation for

Environmental Protection. Hence, the Palm Grove protection and development program always includes awareness-raising activities aimed at all audiences, from schoolchildren to the city's hoteliers and decision-makers in charge of its future. Awareness-raising is based primarily on programs supported by the Foundation: Eco-Schools, Young Reporters for the Environment, Educational circuit. It also includes environmental training for local actors involved in social life, and specific events.

All nine schools within the Marrakech Palm Grove joined the Foundation's Eco-Schools program in 2010. This initiative sought to raise schoolchildren awareness of the environment in a practical way and encourage them to pass this awareness on to those around them. Eco-schoolers are thus ambassadors for the protection of the environment and of the Palm Grove. The schools of Tamesna, Sidi Yahya, Makina, Abiad, Taieb Lemrini, Oum El Fadel, Ouled Jallal, January 11, Ouaha 2, Ibn Al Haytam have all become Eco-Schools and four of them, stood out by quickly hoisting the Green Flag label.



Marrakech - 15 November 2016:
Her Royal Highness Princess Lalla Hasnaa visits the Oum El Fadel school, enlisted in the Eco-Schools program.



Her Royal Highness Princess Lalla Hasnaa promotes awareness of the environment and the future of the Palm Grove among young people, as seen here at the Oum El Fadel school, during the COP22, together with the UN Food and Agriculture Organization (FAO) Director General, José Graziano Da Silva.

Eco-Schools

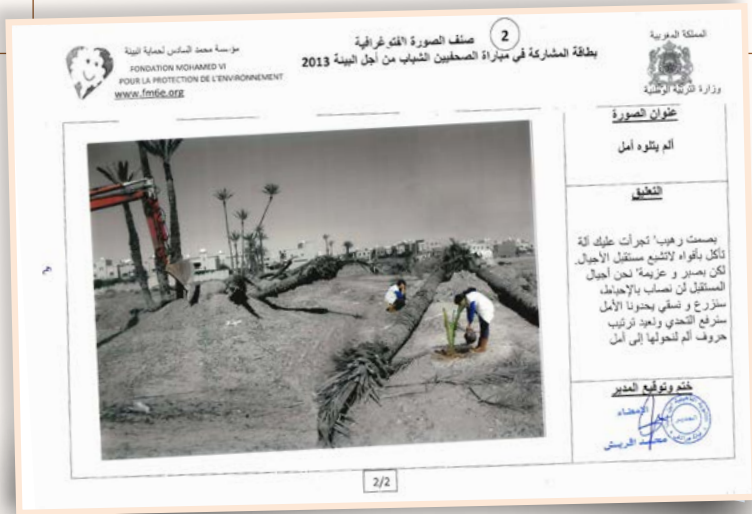
Taieb Lemrini and Oum El Fadel are two model schools selected to host **Her Royal Highness Princess Lalla Hasnaa**, in 2014 and 2016, during her field visits.

They managed to rally businesses, local administrations, associations and academia around their project to obtain a Green Flag label and their environmental activities. This exemplary approach enabled other schools to emulate them and in turn obtain the Green Flag label or an intermediate certification: 11 January, Oulad Jellal and Ibn Al Haytam.

Finally, the Marrakech-Safi region counts 286 schools registered in the Eco-Schools program.

Awareness day

Awareness days and clean-up operations are regularly organized to educate local populations, especially the very young. Each year, World Earth Day is also celebrated, providing an opportunity for new awareness-raising or clean-up operations



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Hiking Path

The hiking path's ambition is to offer a walking or running trail within this vast palm tree-covered area. A stabilized dirt track winds through the palm grove over 5 km, for walks or runs under the palm trees. The path is located in the northeastern part, near the Abiad sector.



Educational circuit

Educational circuit designed by the Foundation are based on a simple principle: learning by playing. Built as miniature game trails featuring different educational modules, they offer children a fun way to learn about the environment every step of the way.

The one in Marrakech comprises five modules: one on wells, another on palm tree cultivation, one on khetaras, marvels of Arab hydraulics, one on composting and one on the biodiversity of the Palm Grove. The educational trail was installed at Arsat Moulay Abdesalam, in the city center, to make it accessible to as many children as possible. Another way to bring the Palm Grove closer to the city.



Young Reporters for Environment

Educational circuit

The Young Reporters for the Environment competition raises awareness of the environment among high school and college students by asking them to produce written, photo and video reports on a new topic every year. They investigate, analyze and offer solutions to an environmental issue.

The Marrakech-Safi region is among Morocco's most awarded regions in this regard, with 28 winning reports in the national competition and as many as four in the highly competitive international competition.

For the 2019 edition, which focused on sustainable agriculture, and the 2021 edition, which focused on biodiversity, Marrakech YREs toured the Palm Grove agroecology program farms and witnessed the effectiveness of this approach to preserving biodiversity.



At Ghabat Chbab, a large olive grove in the heart of Marrakech, city dwellers and tourists are made aware of the environment.

Sustainable tourism and visitor awareness

The Foundation contributed through its awareness work to the creation of a network of hospitality industry players committed to the environment: environmental management, technical equipment and resource management, environmental education and awareness, staff involvement, customer awareness, etc. Some 40 tourist accommodation establishments in Marrakech joined this initiative to help reduce tourism impacts on our climate. The Foundation brought together and managed this network using a digital platform, on which good practices, advice and technical tips for saving water and energy, managing waste and preserving biodiversity are shared. Adoption of these environmental practices has enabled tourist establishments to reduce energy bills by 10% to 20% and increase the proportion of renewable energy in their consumption mix to 50%. The entire staff of these establishments, from top executives to employees, as well as tourists and the whole tourism industry were impacted by this awareness-raising effort.

A Squad

A squad of twelve horsemen from the auxiliary forces was formed in 2014 to secure the Palm Grove and raise awareness among the population. It is housed at the heart of the Palm Grove and patrols on a regular basis, noting violations and raising awareness among local residents.





Partners

Local Partners

- Wilaya of Marrakech-Safi
- Urban Commune of Marrakech
- National Promotion
- Observatory of the Marrakech Palm Grove
- National Institute of Agronomic Research of Marrakech
- Autonomous water and electricity board of Marrakech
- Al Omrane Group Marrakech - Safi
- Norsys Foundation

Local Contributors

- Office Regional Office for Agricultural Development of El Haouz
- Tensift Water Basin Agency
- Urban Agency
- Regional Directorate of Water and Forests
- Observatory of the Environment and Sustainable Development
- Regional Academy of Education and Training

National Partners

- Ministry of Energy Transition and Sustainable Development
- General Directorate of Territorial Communities
- National Agency for Water and Forests
- Moroccan Agency for Energy Efficiency
- OCP Group
- OCP Foundation
- Crédit Agricole Group
- CDG Foundation
- Al Mada Foundation
- National Electricity and Drinking Water Board
- Morocco Highways
- Moroccan Agricultural Mutual Insurance Company
- Copper Pharma
- Med Z (CDG subsidiary) (filiale CDG)

International Partners

- Fourtou Foundation
- Agnelli Foundation
- Suez Environment
- Municipality of Elche
- Agrisud International

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