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High Atlas Foundation
For sustainable prosperity in Morocco

PLANTING TREES WITH THE HIGH ATLAS FOUNDATION

High Atlas Foundation

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Executive Summary

Morocco is among the world's most vulnerable regions to climate change facing a variety of social and environmental challenges, including deforestation, soil erosion, desertification and limited water availability due to overexploitation of natural resources. Most rural communities are especially exposed to systemic poverty.

Around 19% of the rural population live in extreme poor conditions and a lot more are affected by unemployment and a lack of education. The urban-rural gap in poverty is large and growing.

Planting trees with the High Atlas Foundation (HAF) addresses these issues. It helps to alleviate poverty, as farmers will generate more revenue by planting high-quality fruit trees.

Planting trees also mitigates the effects of climate change, prevents environmental degradation and contributes to maintaining biodiversity by planting endangered and organically growing native species.

The various social and environmental challenges the country is facing are very likely to increase due to climate change and environmental pollution. HAF is seeking to counter these negative developments by increasing its tree planting efforts on a massive scale.

Within the next two years HAF is planning to plant **1.2 million trees annually**, beginning as seeds in 11 nurseries in the country. This will impact the lives of **100,000 to 120,000 people**. To deliver this impact HAF needs an additional funding of **$445,000.**

HAF has secured land agreements to construct ten additional nurseries. In a 3-year duration those nurseries can grow **11 million** trees impacting the lives of **400,000 persons**. In order to deliver this program HAF needs an additional funding of **$2 million**.

The trees are raised in partnership with local communities in nurseries all around the county and are then regionally distributed to farming families, schools, and civil society organizations.

How can you partner with us?

- Contribute to our current nursery expenses to reach our goal of planting 1.2 million trees annually through 2022
- Fund one of our planned nurseries partly or fully
- Fund a certain number of trees annually at $ 0.60 per tree
- Grant a certain amount of money annually that will be invested in tree planting projects

Organizational Background

The High Atlas Foundation (HAF) is a Moroccan association and a U.S. 501(c)(3) not-for-profit organization founded in 2000 by former Peace Corps Volunteers committed to furthering grassroots sustainable development. HAF supports disadvantaged communities to implement human development initiatives in organic agriculture, youth and women's empowerment, education, and health. Since 2011, HAF has Consultancy Status at the United Nations Economic and Social Council.

Some HAF activities promote establishment and conservation of forest remnants by planting trees that, in addition to providing climatic services, can contribute to economic development. HAF has planted 3.5 million fruit trees (2 million since 2014), in 23 provinces in Morocco.

Currently, HAF has 11 tree nurseries partnering with communities in seven provinces. HAF is planting 1.22 million fruit seeds of eight different tree varieties during the 2020 season. The saplings are raised between one and two years and then distributed to the beneficiaries. One nursery is located in a university, one in a school, and two in children protection centers. Two nurseries are managed by women's cooperatives. See a list of all nurseries in Appendix A.

We distribute trees to farmers that are the sole beneficiaries of the revenue they generate. We also plant trees with schools, promoting health and beautification of educational surroundings, and conduct workshops with children of all ages to raise environmental consciousness.

HAF receives land lent in-kind by public and civil agencies including the High Commission of Waters of Forests and the Fight Against Desertification (HCWFFAD), the Ministry of Youth and Sports, schools and universities, as well as the Moroccan Jewish community and various cooperatives, associations, and provincial authorities across the country.

Why Plant Trees in Morocco?

Seventy-five percent of the people who experience poverty in Morocco are in rural areas. Many farmers use crops and agricultural techniques that allow them to generate only a minimum profit. According to the country's Ministry of Agriculture, barley and corn cover 70% of agricultural land and yet generate only 10-15% of agricultural revenue.

Unemployment and a lack of education make many families dependent on their members migrating to the cities. Surveys and conversations with rural communities often highlight the same problems: insufficient economic opportunity; inadequate water or sanitation infrastructure; high dropout-rate from school, particularly of young girls; and environmental degradation.

Many of these socio-environmental problems will only worsen as climate change begins to tighten its grip on the country. Increasing rates of aridity will affect rural communities most severely. The county has experienced significant forest loss leading to soil erosion and falling water tables, causing stress for farmers across the country and endangering local plant and animal species. Those severe problems must be tackled to preserve Morocco's environment.

Planting trees is a solution that contributes to alleviating poverty and environmental challenges in the most seriously affected areas. Planting trees helps to conserve biodiversity. Morocco is home to many native fruit tree species that are now threatened, including 14 endangered varieties of endemic Moroccan figs, as well as varieties of apple, carob, pear, and date. There are 13 varieties of fruit trees that grow organically in Morocco, as well as dozens of endemic subspecies. HAF is committed to foster the cultivation of endangered and organically growing species and currently plans to plant 18 different fruit and forest tree species (see Appendix B),

Cultivating seeds to saplings in our own nurseries is approximately 20 percent of the cost of buying already grown saplings from existing private nurseries. This allows considerable expansion of agroforestry plantations in Morocco and the building of a model project that develops an agroforestry value chain, from nurseries to plantations.

Goals & Objectives

Long-term Goals and Vision

In order to provide the country with the trees needed to solve its most pressing economic and environmental issues, HAF is seeking to expand its work on a massive scale. We want to promote a vision to plant one billion trees in Morocco by 2030 and be a major contributor and implementer resource of this project.

A major goal is to utilize the current partnership with HCWFFAD to plant trees on government land and assist in restoring the nation's forests. This would enable us also to direct more benefits to the landless which are the most vulnerable among the rural poor.

Additionally, we work on registering, certifying and trading the carbon credits of our planted trees to re-invest the revenue in community development projects and new tree nurseries.

Short-term Goals

The first step of our efforts is to extend our collaborations with rural communities to provide more cooperatives, farming families, and schools every year with high-quality fruit trees. We have secured the land to construct 10 new nurseries that can grow 11 million seeds to saplings in a 3-year duration.

Presently, HAF has more parcels of land for tree nurseries than readily available finances to implement. With the capital needed to reach our goal of planting 50 million trees annually, potentially millions of rural people would benefit from improved living conditions, while, at the same time, the environmental integrity and rich biodiversity of the nation would be fortified.

In addition to the trees being planted in schools and in the private terraces and fields of framing families, they will also be planted on communal and public domain lands through new partnership agreements. This enables every household in targeted village communities to benefit from the trees, including those households who are without private land ownership.

Project Activities

By the end of 2024 HAF wants to accomplish the following steps:

- Create 10 new tree nurseries – including the steps of planning, meeting with local authorities and communities, construction of nursery infrastructure, seeding and maintenance
- Employ at least 60 persons in construction
- Employ at least 15 local nursery care takers as well as 40 seasonal helpers to grow and monitor the trees
- Grow 11 million seeds to saplings
- Identify beneficiaries for the trees through participatory planning with communities
- Distribute the trees to farming families, schools, universities, and associations
- Engage at least 10.000 youth (8-26) in capacity-building and environmental educational programs
- Increase capacity building – and develop agricultural business plans – for cooperatives in processing, commercialization, and marketing of their product
- Develop and support women's cooperatives in nursery management as well as processing, commercialization, and marketing of different products
- Fulfill the existing national contract with HCWFFAD to plant carob and other forest trees on government land to benefit local communities as well as prevent erosion and soil degradation
- Increase plantations on community land for the benefit of the landless; plant at least 10,000 ha of trees on communal land and 17,500 on private terraces and fields

Beneficiaries

Farmers and their families benefit directly from receiving trees which allow them to increase their agricultural revenue. Planting trees also contributes to a better education for their children as the higher income can be used to afford schooling materials or transportation costs.

Building tree nurseries creates jobs in remote, disadvantaged areas that lack employment opportunities. Building a nursery creates jobs in construction and maintenance. Additionally, every nursery employs 1-2 local nursery caretakers as well as up to four seasonal helpers.

We foster cooperative building particularly for rural women. By now HAF has successfully supported the development of approximately 50 women's cooperatives in food production, fruit tree agriculture, medicinal plants and nursery management. Through new nurseries we can create more of those job opportunities: 6 of the 11 nurseries will be managed by women's cooperatives.

We conduct continuous meetings with the communities using the participatory approach to support them in their prioritized projects. We assist farmers in developing a better market position through processing, commercialization, and marketing of their products. HAF and its partners from all sectors are committed to organic value adding production centered in the rural areas.

Budget Narrative

Rationale for Different Costs

The costs originate from the specific phases tree nurseries undergo. The initial phrase is costly, requiring significant infrastructure installation, the second phase involves the labor intensive process of grafting, and the third phase is distinguished by partnership with local farmers and education centers to effectively transplant the saplings in a timely fashion - as soon as possible after the start of the new year to allow the trees to capture the greatest amount of rain. In the fourth phase, land is revitalized with compost, fresh earth, tilling, and reseeding. Capacity building, which involves developing the skills of nursery caretakers and farmers to plant, irrigate, and upkeep, is carried out continuously during all four phases.

The costs associated with building and maintaining nurseries are at their peak in the initial year of creation. During this first year, infrastructural costs associated with installing irrigation systems account for the largest portion of the total expenditure, including building wells and basins, installing water pumps and pipes, and constructing terraces.

Benefitting communities provide labor in-kind for the transplanting of saplings from nurseries to surrounding agricultural fields and public-school yards. Further, to maintain the nurseries, HAF employs and supplies skilled caretakers, from the local benefitting communities, with livable wages and health insurance. Capacity building for these caretakers, best delivered in an experiential manner i.e. learning by doing, is conducted in real-world situations.

Following the transplanting of saplings, all nurseries are then reseeded. Damaged pipes are replaced and seasonal workers are hired to complete replanting by the middle of March. Therefore, second and subsequent year costs are dramatically lower than first year expenditures from the fixed installations. However, medium and long-term financial sustainability is made possible due from revenue generated from the sale of saplings - sold at one-third to one-half of market rates - to cover ongoing seeding and maintenance costs.

The High Atlas Foundation manages the costs associated with the installation of the tree nurseries, provides oversight, and develops timelines with the local community implementors

who are also beneficiaries. The beneficiaries themselves are vital toward the successful management of nursery initiatives.

The land upon which the nurseries are built is contributed in-kind by the public, private, and civil partners listed above. This, as well as growing trees from seeds instead of from saplings, is essential in keeping costs low, thus enabling HAF to obtain value within the local community settings where these nurseries are established.

Risk Management

Risk is in this project is managed in two primary ways. First, risk is shared. This is accomplished by the nursery land being lent in-kind, the materials for installation being provided by external partners and investors, and the labor being contributed in all phases by the benefitting local people. Therefore, if the project were to fail (in HAF's experience there has not been a single case where a nursery has remained unproductive) thankfully no one individual, partner, or entity endures the entire loss. The free lending of land and the provision of materials by HAF partners are indispensable for Moroccan farmers' transition from traditionally growing staples of barley and corn to far more livelihood-enhancing organic fruit tree agriculture.

Secondly, risks are mitigated because of the flexibility, adaptability, and resiliency of the project. The extent to which there is quality participatory decision-making between partnering groups determines whether an endeavor can adapt and endure. Fluctuations, be they social or environmental, are always a challenge. The one element that we can control is our ability to make appropriate decisions and adjust to evolving circumstances. In this case, the High Atlas Foundation's mission and core competencies are in facilitating participatory dialogue among community beneficiaries, inclusive of all, and public, private, and civil organizations. The key ingredient of successful interactive group dialogue is the generation of information by the parties, providing an essential basis for sustainable decisions to be made. Thus, by fostering a stable and resilient environment, risks are mitigated in HAF's nursery projects.

Maximizing Survival Rates and Productivity

To maximize survival rates, first, the High Atlas Foundation installs green houses and shaded areas in the nursery stage. This is a time proven method for ensuring seed survival and proper growth. Second, grafting, another significant contributor in bolstering trees' constitution and productivity, is put into practice. Third, most sapling varieties we plant are grown in individual sacks, promoting their vitality and ability to be planted at a wider time duration throughout the year. Finally, there is much value added in the marketplace for saplings grown in individual soil plots and sacks, as HAF does.

The High Atlas Foundation follows a self-sustaining model, wherein revenue generated by the sale of trees is reinvested for reseeding and maintaining nurseries for the years to come. In this effort though, HAF only sells its trees to local farmers at a symbolic price, usually between a third to a half of the going market rate. Moreover, trees are given to public schools without cost, and, if farmers do not have to the means to purchase the trees, even at the highly reduced rate, they will be provided to them without cost.

Monitoring & Evaluation

Currently, our team includes three staff members who are devoted full-time to the monitoring of our trees (In total the current staff are 30 people, most of whom work in the agroforestry-environmental sector). This encompasses oversight of each tree's survival rate, height, and diameter over time, in order to understand our community and environmental impact.

We insert this data, including the GPS points, into a registry and a Geographic Information System. This enables us and our partners to properly evaluate implementation strategies, identify fields of improvement and achieve enhanced tree survival rates and sustainability.

The survival rate of trees varies from region to region due to environmental conditions. Overall, the approximate survival rate of HAF's trees is 78%. Farming families are integral to the data gathering and monitoring system and the process of replanting where trees did not survive. This allows us to reduce costs and incorporate much greater areas into the overall system.

HAF provides its partners their entire registry containing the GPS coordinates of tree planting locations, including maps generated by GIS. We are constantly traveling to the planting locations and invite all partners and donors to join these visits to learn about our work.

HAF provides financial reports of its projects to its partners on a quarterly basis or at mutually agreed upon time intervals.

HAF properly manages contributions upholding the highest standards of grant management, reporting, and financial monitoring. We maintain financial records relating to all expenditures and have field logs of all project activities. We use the QuickBooks accounting system to track all grant and activity expenses. We file tax forms with the United States Internal Revenue Service and disseminate all information regarding project activities, fundraising, and financial allocations to projects with the Office of the Secretary General of the Government of Morocco.

Sustainability

Since 2000, HAF has reached 23 provinces in Morocco to implement sustainable development projects for vulnerable and marginalized populations. We work integrally with youth, women, community groups, and university, government, civil, and business partners, and apply the participatory action planning approach in all project phases.

HAF's tree planting projects focus predominantly and directly on four of the United Nation's sustainable development goals (SDGs): no poverty, zero hunger, decent work and economic growth; as well as reduced inequalities and partnership for the goals. The project will also serve four additional SDGs: climate action, life on land and industry innovation and infrastructure.

Since 2011, the High Atlas Foundation has had Consultative Status at the Economic and Social Council at the United Nations. This status affords HAF the opportunity to participate in policy development forums, primarily through our provision of oral and written policy statements, including regarding the deliberations that led to the development and ratification of the SDGs.

Our multidimensional agricultural projects engage local communities, and partners with all sectors on socio-economic and environmental activities ranging from nurseries to consumption of organic certified products.

Annex

Appendix A: Current nursery Expenses Nov. 2019 – July 2020

This Table lists all expenses for our current nurseries until July 2022 and a prospective planting of 2.4 million trees in total.

Budget

Nursery Expenses from November 2019 - July 2022			
Description of Expenses:	Nov 19 - July 21 ($)	Aug 21 - July 22 ($)	Total ($)
Salaries			
13 nursery caretakers	88,358	64,152	152,510
Nursery workers / seasonal	38,793	50,842	89,635
Driver	16,632	9,504	26,136
Project manager (Said El Bennani)	27,027	15,444	42,471
Monitoring team (3 people)	62,370	35,640	98,010
Director of Projects Amina El Hajjami (30%)	11,713	6,693	18,406
TOTAL Salaries	244,893	182,275	427,168
Operating Expenses			
Manure, soil, and sand	11,344	19,759	31,103
Seeds	95,406	0	95,406
Electricity	520	3,300	3,820
TOTAL Operating Expenses	107,270	23,059	130,329
Transportation & Accommodation			
Transport of materials, cuttings, and seeds	2,970	2,970	5,940
Per diems	10,395	5,940	16,335
Accommodation	10,395	5,940	16,335
Distribution (truck)	9,900	4,950	14,850
Fuel / transport for visits to nurseries and for monitoring	12,474	7,128	19,602
TOTAL Transportation & Accommodation	46,134	26,928	73,062
G&A			
Administration: communication, securing authorizations, marketing, financial management, reporting, executive oversite, indirect costs	20,790	11,880	32,670
Training (Planting seeds, grafting, irrigating, general capacity building)	14,553	8,316	22,869
Maintenance (pump, irrigation system, equipment, plastic bags)	107,635	36,729	144,364
TOTAL G&A	142,978	56,925	199,903
Investments			
Vehicle - Mitsubishi L200 Spotero DC 4x4, pickup	34,650	0	34,650
Phones (x4), GPS (x3), laptop (x1), and camera (x1)	4,069	0	4,069
Budget for Imegdal nursery	87,383	0	87,383
TOTAL Investments	126,102	0	126,102
Total in $	667,377	289,187	956,564
Funded by partnerships			511,500
Remaining			445,064

Appendix B: Prospective Nurseries Expenses

HAF currently has partnership agreements with public and civil agencies to receive in-kind parcels of land for ten new fruit and forestry tree nurseries located in nine regions of Morocco.

In a 3-year duration and at a cost of $2 million, the 10 tree nurseries (below) can grow 11 million seeds to saplings that are then transplanted to farmers' fields and schools.

Province	Nursery Land Partner	Tree Varieties	Total Trees	Cost in $
1. Taroudant	Department of Waters & Forests (Taroudant)	Almond: Prunus amygdalus - Argan: Argania spinosa - Carob: Ceratonia siliqua L. - Cherry: Prunus avium - Cypress: Atlas and Arizona - Fig: Ficus carica - Olive: Olea europea - Pomegranate: Punica granatum or Safri - Walnut: Juglans régia	1.5 million	$300,000
2. Ourzazate (Ighrem n'Ougdal)	Moroccan Jewish Community	Almond, Carob, Cherry, Fig, Pomegranate, Walnut	1.3 million	$270,000
3. Azilal (Imzourhnane)	Department of Waters & Forests (Ben-Mellal)	Almond, Argan, Carob, Cypress, Cherry, Fig, Green Oak: Quercus ilex, Olive, Pomegranate, Walnut	1 million	$200,000
4. Al Haouz – (Ijoukak)	Department of Waters & Forests (Marrakech-Safi)	Almond, Argan, Carob, Cedar: Cedrus atlanica, Cyprus: Cupressus atlantica, Cherry, Fig, Grape: Vitis vinifera L., Olive, Pomegranate, Quince: Cydonia oblonga, Walnut	1.5 million	$250,000
5. Fes	University Sidi Mohammed Ben Abdellah	Almond, Carob, Cherry, Fig, Olive	900,000	$200,000
6. Ifrane (Azrou)	Ain Leuh Public School	Carob, Cherry, Walnut	900,000	$200,000
7. Ifrane	Al Akhawayn University	Almond, Carob, Cherry, Walnut	1,500,000	$300,000
8. Boujdour	Nasr School	Argan, Carob, Fig, Olive, Pomegranate	700,000	$180,000
9. Bouarfa -El Hamda	Province of Figuig, Oujda	Almond, Carob, Fig, Lemon, Pomegranate	1 million	$200,000
10. Ouezzane – Fig nursery	Department of Waters & Forests (Tetouane)	Almond, Argan, Carob, Cherry, Fig, Lemon, Olive, Pomegranate, Walnut	1 million	$200,000
11. Ouezzane – *Fig and carob forest*	Ouezzane (Tetouane)	Acacia (gummifera, raddiana, albida and Faidherbia), Carob, Eucalyptus (torquata, gonphocephala, sideoxylon, viminalis), Fig, Olive	320,000 trees	$1.6 million

Costs per tree

Appendix C shows the exemplary calculation for a tree transplanted from one of our nurseries with an average cost of $ 0.6. This cost covers the whole growing process from planting the seed in a nursery until transplanting it to the land of the beneficiaries including monitoring of the trees twice in a five-year period.

Appendix C: Current Nurseries and tree capacities for 2020

Planning for planting seeds and cuttings in HAF nurseries in 2020	
Nurseries	**Number of seeds and cuttings**
Ouaouizaght - Olive Mountain Cooperative (Ouaouizaght, Azilal)	150,000
Akrich - Jewish Community (Al Haouz province, Tamslouht commune)	35,000
Tadmamt - Water and Forest (Al Haouz province, Asni commune)	200,000
Sidi Mohamed Ben Abdellah University (Fes)	140,000
Salam Primery School (Ifrane)	100,000
Children Protection Center (Fes)	160,000
Children Protection Center (Oujda)	110,000
Toubkal - Agerzrane Women's Coop (Taroudant province, Toubkal commune)	27,000
Imerdel - Jewish community (Ourzazate province, Agouim municipality)	100,000
Ouirgan - Tassa Ouirgan Association (Al Haouz province) In kind partnership	40,000
Imegdal - Cooperative of Walnut & Almond Production (Al Haouz province, Ijoukak municipality)	160,000
Total	**1,222,000**

Appendix D: HAF's Tree Species

The tree varieties that HAF is committed to planting with cross-sectoral partners in Morocco are:

- Almond: *Prunus amygdalus*
- Argan: *Argania spinosa*
- Avocado: *Persea Americana*
- Carob: *Ceratonia siliqua L.*
- Cedar: *Cedrus atlanica*
- Cherry: *Prunus avium*
- Cyprus: *Cupressus atlantica*
- Date: *Phoenix dactylifera*
- Eucalyptus: *Torquata, gonphocephala, sideoxylon, camaldulensis, viminalis and auttes*
- Fig: *Ficus carica*
- Grape: *Vitis vinifera L.*
- Jujube: *Ziziphus jujube*
- Lemon: *Citrus limon*
- Olive: *Olea europea*
- Pines: *Pinus halepensis, canariensis et pinaster*
- Pomegranate: *Punica granatum* or *Safri*
- Prickly pear: *Ficus indica*
- Quince: *Cydonia oblonga*
- Walnut: *Juglans régia*

Appendix E: Cost per tree as exemplary in the Akrich Nursery

Tree cost (in MAD) at Akrich Nursery					
		Explanation			
Trees planted	30,000	-	-	-	-
Survival rate	80%	-	-	-	-
Trees transferred	24,000	-	-	-	-
		-	-	-	-
Soil	1,050	Truck loads of soil	7	Cost per truck load	150
Natural fertilzer	2,100	Truck loads of fertilizer	3	Cost per truck load	700
Cutting or Seed	6,000	Price paid per cutting	0.2	Number of cuttings	30,000
Labor - caretaker	48,600	monthly salary	4,050	Months worked	12
Labor - supplemental	4,500	daily salary	100	Days worked	45
Plastic bags	750	Number of bags used @ 50 trees per bag	600	Cost per bag	1
Plastic ground cover	600	Plastic rolls needed	1.5	Cost per roll	400
Electricity	4,730	Annual cost	4,730		
Maintenance of pump	33,300	Annual cost	33,300		
Total annual cost	101,630				
Cost per tree planted	3.39				
Cost per tree transferred	4.23				

Additional costs:
Monitoring: 35 % (1.5 MAD)
Administration & Management: 5 % (0.2 MAD)
Total cost per tree transferred: 5.93 MAD = 0.6 $

Not yet included
Nursery to customer transportation
Water basin amortization