



# جذور لبنان

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ISSUE 04





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# Word of the President



## THE CHALLENGE IS AHEAD...

In 40 years we have lost 40% of our forest cover and, unfortunately, the trend is still downward due to forest fires, urbanization and tree cutting: all the ministries, municipalities and NGOs' reforestation efforts don't come even close to replacing lost forest areas. As a consequence, the rapid desertification process is taking its toll.

The Ministry of Agriculture has devised the 40 million-tree reforestation program that should take us back to a 20% forest cover, but the program is hampered by numerous difficulties:

- with the currently used reforestation techniques, the cost per tree planted that survives for more than 3 years is between 12 and 15 dollars, i.e. the cost of the program exceeds 500 million dollars which is not within any reasonable budget that could be allocated,
- the largest areas that can be reforested are subject to extensive overgrazing and it has been known worldwide that competing head to head with grazing has never worked,
- as reforested areas are somehow protected, weeds grow extensively and create very serious fire hazards,
- last but not least, there is not yet a serious awareness of Lebanon's leadership as well as the public at large about the long term risks - both economical and environmental - that Lebanon faces with such a rapid desertification process. This is why, Jouzour Loubnan, in addition to reforestation and awareness activities, has

concentrated major efforts and resources in 2013 - and will continue to do so - in the following fields:

- developing new techniques aiming at reducing reforestation costs by planting seeds or seedlings without or with little irrigation,
- designing a cost effective individual protection for the trees allowing grazing in-between the trees and, incidentally, reducing forest fire hazards,
- creating a think tank to propose structural approaches to ensure the success of the 40 million-tree reforestation program,
- cooperating with international and local institutions and NGOs and with Saint Joseph University, faculty of science, in the above three fields.

Although we should have the first concrete results in the fall of 2014, this is a long-term program requiring continuous efforts and... financing. Jouzour Loubnan would like to thank you once again for your support.

**Raoul Nehme**  
President

معاً نزرع غابات الغد

TOGETHER WE PLANT  
TOMORROW'S FORESTS



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# Jouzour Loubnan's Mission

## OUR MISSION IS TO PARTICIPATE IN THE RESTORATION OF LEBANESE WOODLAND AND PROMOTE SUSTAINABLE FORESTATION MAINLY IN ARID REGIONS.

We have chosen to intervene mainly in arid mountainous regions as, on one hand, they are very often dismissed in exiting forestation programs and, on the other hand, the benefits of such forestation are tremendous.

The success of our forestation campaigns resides in our commitment to ensure the appropriate irrigation, guardianship and protection of the trees we plant. This success can be difficult to achieve, more so in arid regions due to extreme weather conditions, lack of surface water, poor soil quality and overgrazing. In order to overcome the issues at hand, we devised a special program taking into account, for each region, all technical and socio-economic aspects related to such complex environments.

As a result, Jouzour Loubnan has **three interconnected goals:**

### PLANT MAINLY IN ARID REGIONS



Increase the woodland area in Lebanon by planting indigenous species to restore degraded high mountain ecosystems and develop wildlife habitats.

### EMPOWER LOCAL COMMUNITIES



Empower the local community to protect, manage, promote and benefit from the projects.

### PROMOTE ENVIRONMENTAL AWARENESS



Promote environmental awareness of our natural resources amongst younger generations, locals and officials.



# Who are we?

We are a small group of volunteers and benevolent, coming from various professional and personal backgrounds



**Raoul Nehmé**  
President

**Profession:** General Manager, BLC Bank  
**Education:** Ecole Polytechnique de Paris & Ecole des Mines de Paris



**Magda Bou Dagher Kharrat**  
Vice President

**Profession:** Head of Life and Earth Department, St Joseph University, Faculty of science  
**Education:** PhD in plant molecular biology, Université Pierre et Marie Curie



**Hiba Aboulhosn**  
Communications & Media

**Profession:** Communications Consultant & Partner, keepitsimple - Communications Agency  
**Education:** Masters in visual communication, Edinburgh University



**Hani Hoyek**  
Accounting

**Profession:** Head of Strategic Development, BLC Bank  
**Education:** Grande Ecole de Commerce EM Lyon



**Charles El Hage**  
Member

**Profession:** Retired as Senior Vice-president with Booz & Company  
**Education:** Master of Science in Industrial Engineering & Bachelor Industrial Management, Purdue University, Indiana, USA



**Rami Kozhaya**  
Project Management

**Profession:** Support group coordinator, BLC Bank  
**Education:** MBA - Management of Financial institutions, USJ - Sorbonne - Paris Dauphine



**Farid Maalouf**  
Engineer Consultant

**Profession:** Execution Director, VEOLIA-Lebanon  
**Education:** Civil Engineer, ESIB



**Riad Mouawad**  
Graphic Design

**Profession:** Creative & Managing Director BlackInk :: Creative boutique agency  
**Education:** Visual communication, Notre Dame University

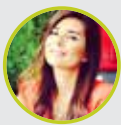


**Fadi Nassif**  
General Secretary



**Ghada Zeaiter**  
Treasurer

**Profession:** Executive assistant, BLC Bank



**Joelle Saab**  
Project Coordinator and Laboratory technical manager

**Education:** MS in Environmental Sciences & Management, USJ



**Tony Chahine**  
Site controller

**Education:** MS Agricultural Engineering, Lebanese University.



**Bouchra Douaihy**  
Project Management

**Profession:** University Instructor - Saint Joseph University and Lebanese University  
**Education:** PhD in Plant Ecology, St Joseph University / Muséum National d'Histoire Naturelle de Paris



**Frederic Khalil**  
Member

**Profession:** Managing Partner, BEAR  
**Education:** MBA, Université St Joseph & Paris Dauphine



# Jouzour Loubnan's Numbers



## **SINCE 2008**

### **WE PLANTED**

# **168.473**

### **TREES:**

- from 25 native species
- on more than 4 million square meters, i.e. 400 hectares,
- in 17 different regions in Lebanon,

### **WITH THE ASSISTANCE OF**

- over 4000 volunteers,
- the Lebanese Army and French, Spanish and Nepalese UNIFIL soldiers and officers.

### **WE EFFICIENTLY ORGANIZED**

- Over 40 awareness sessions
- For more than 650 students, scouts, etc.

### **WE ACTIVELY PARTICIPATED**

- in dozens of fairs and exhibitions,
- several workshops and seminars
- countless local TV and Radio programs

• **WE FOUNDED AND ARE SUCCESSFULLY OPERATING A LABORATORY FOR SEED GERMINATION AND CONSERVATION.**

• **WE'VE HAD NUMEROUS ARTICLES PUBLISHED IN SEVERAL NEWSPAPERS AND MAGAZINES.**

• **WE ORGANIZED 3 SUCCESSFUL GALA DINNERS**

• **WE INITIATED THE GREEN PROGRAM FOR REAL ESTATE**

• **WE LAUNCHED 3 SUCCESSFUL MASSIVE AWARENESS MEDIA CAMPAIGN ON**

- 4 local TV stations,
- on 5 radio stations
- and hundreds of billboards, unipoles, etc.

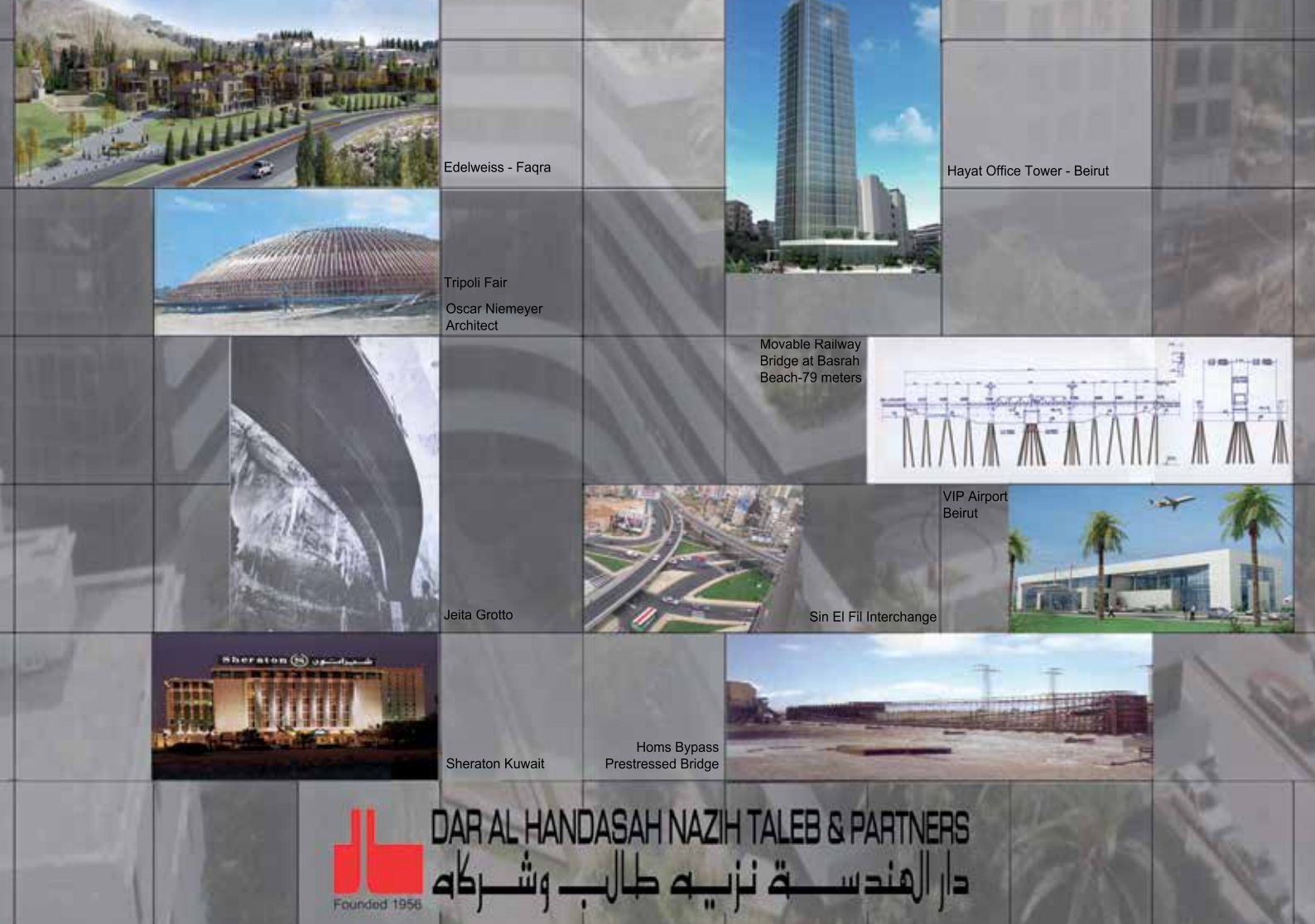
**ALL OF THIS WAS MADE POSSIBLE BY**

# **14 JOUZOUR LOUBNAN DEDICATED MEMBERS**

**AND MORE THAN**

# **100 DONORS**





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# Plantation Methodology



**IN ORDER TO INSURE THE LONG TERM TREE SURVIVAL WE HAVE DEFINED A COMPREHENSIVE PROGRAM BASED BOTH ON SCIENTIFIC GROUNDS, THANKS TO OUR PARTNERSHIP WITH SAINT JOSEPH UNIVERSITY, FACULTY OF SCIENCE AND, ON EMPIRIC APPROACHES, DUE TO THE LACK OF PRIOR EXPERIENCE IN THE REFORESTATION OF ARID, HIGH ELEVATION AND OVERGRAZED REGIONS:**

- We plant only on municipal lands based on a contractual commitment from the municipality to protect the forested area.
- We choose the species amongst the native trees in accordance with the studied ecosystem of the targeted region. In addition, we strive to enhance biodiversity through the choice of various native species including shrubs and small plants well adapted to the local environment and its constraints.
- In regions with overgrazing, we have either planted trees over two-meters tall or fence the area to be planted. In other regions, we plant mainly 15 to 30 cm tall trees.
- We purchase the trees from selected local nurseries and for some species like *Cedrus libani* and *Juniperus excelsa* we perform genetic analysis in order to guarantee their origin.
- We apply plantation protocols insuring optimal survival rate after plantation. Professional supervision is provided for each forestation campaign for as many years as needed.
- We install an irrigation system and insure regular watering and guardianship through local personnel for a period of 3 years. This increases the awareness amongst the local community. The watering frequency is decreased progressively every year.
- We control on a regular basis the status of the trees we have planted, the quality of the maintenance and the irrigation and guardianship services.

# Plantation Methodology

## IN 2013, IN ORDER TO OPTIMIZE OUR PLANTATION TECHNIQUES, WE HAVE BEEN TRYING FOUR NEW PLANTATION PROTOCOLS

1. Oak seed sowing
2. Individual fencing,
3. Plantation of bare root seedlings
4. Plantation without irrigation.

1



Sowing seeds without irrigation according to various protocols dividing the cost of reforestation in areas where there is no grazing by at least five times

2



Individual fencing protects seedlings from grazing keeping the rest of the land open for grazing which reduces fire hazard, allowing for hundred of square kilometers to be reforested

3



Using bare root seedlings reducing potentially the cost of reforestation by 1\$ per seedling

4



Planting seedlings without or with limited irrigation, dividing the cost of reforestation by two.

As a consequence we expect our overall survival rate to be reduced for the sake of long-term reforestation protocols optimization. The upcoming tests results will be published in our next issue and will show us which practice is optimal to the seedlings survival and is more cost efficient.

# Where We've Planted

**KFARDEBIAN**  
**94,726**

**HARF SHLIFA  
& BTEDII**  
**26,950**

**AYNATA**  
**16,924**

**EHMEJ**  
**9,300**

**CHABROUH**  
**6,914**

**EBEL EL SAQI**  
**6,465**

**EHDEN**  
**3,500**

**DAMOUR**  
**1500**

**ZAAROUR**  
**1,400**

**BTEDDINE**  
**500**

**TARCHICH**  
**418**

**AL AKOURA**  
**300**

**MAYSS EL JABAL**  
**300**

**MAJDAL SILM**  
**200**

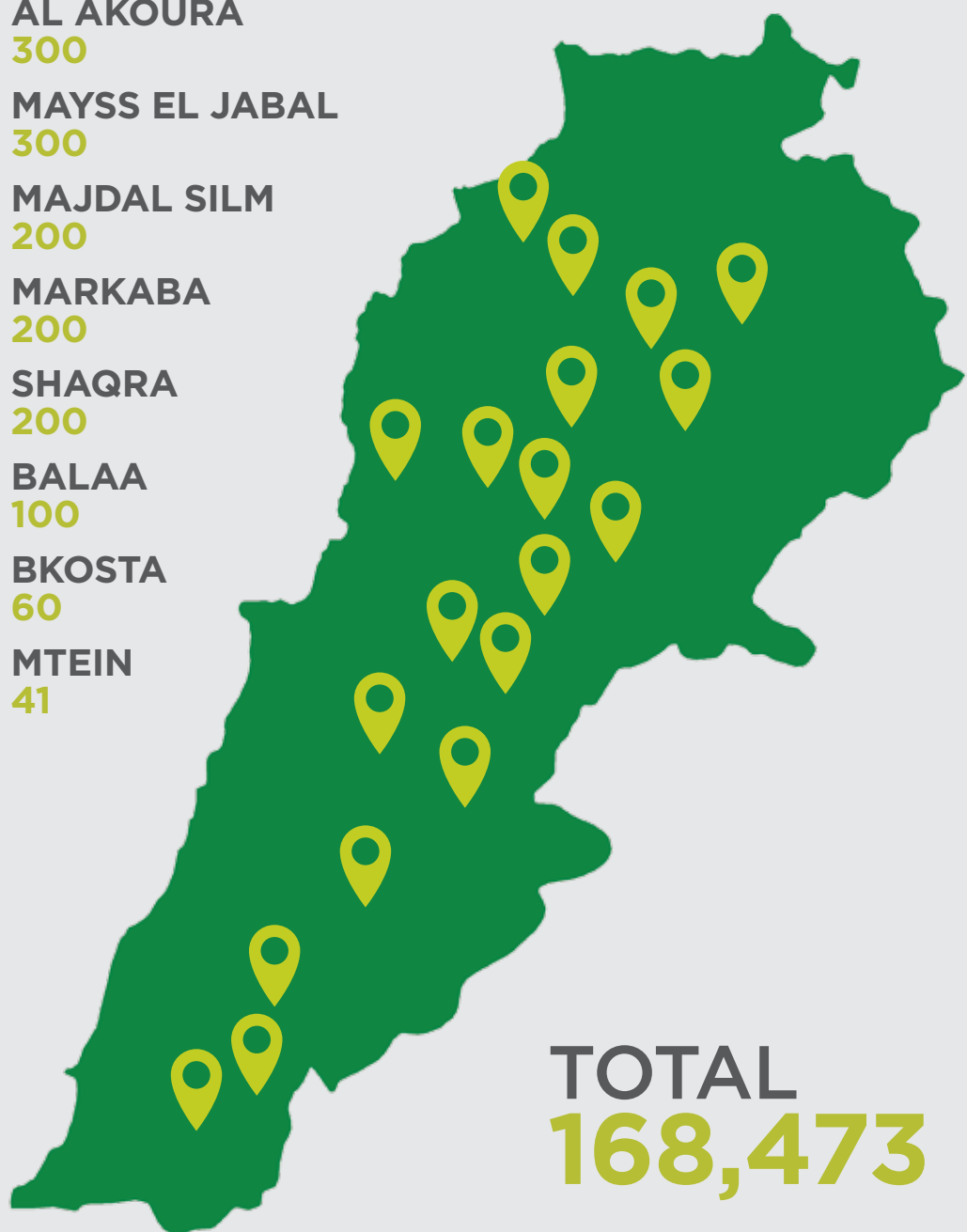
**MARKABA**  
**200**

**SHAQRA**  
**200**

**BALAA**  
**100**

**BKOSTA**  
**60**

**MTEIN**  
**41**



**TOTAL**  
**168,473**



# Jouzour Ehmej

## 2009 - ONGOING



### IN 2009

Jouzour Loubnan started a reforestation project in Ehmej, on the right side of the main road toward Laklouk, on a municipal land protected by the municipality from grazing. With the active collaboration of the Municipality of Ehmej and its President Mr. Nazih Abi Semaan, 125 juniper trees and 3.760 cedar trees were planted in 2010.

### IN 2012

Jouzour Loubnan & Les Scouts du Liban teamed up to plant 4,000 additional trees without irrigation. Coming from all regions across Lebanon, a group of 575 scouts, aged between 16 and 22, headed to the municipal lands of Ehmej to plant Lebanese Cedar, Oak and Juniper trees, with the support and under the supervision of Jouzour Loubnan's team. Unfortunately, this plantation protocol without irrigation was not successful as we experienced a survival rate of a mere 10%.

### IN 2013

Jouzour Loubnan's team invited friends for a public plantation campaign, adding 1,415 trees in order to test a new protocol with limited irrigation to the previous plantations, where the amount of trees planted on this site has now reached 9,300 out of which 4,891 trees were offered by Lebanon Reforestation Initiative (LRI) - a project funded by the United States Agency for International Development (USAID) and implemented by the United States Forest Service (USFS).

In addition 3,885 trees were purchased from Akiki's nursery in Kfardebian and from Fakhri's nursery in Deir El Ahmar. The results of this plantation protocol will be available next year. Finally, the Municipality of Ehmej rewarded everyone with breakfasts and lunches during all the plantation days.



**9,300**  
**TREES PLANTED**



# A New Forest in Jezzine



**REGION:**  
**TOUMET NIHA, JEZZINE**  
**AREA:**  
**500,000 m<sup>2</sup>**  
**TREES:**  
**32,000 NATIVE SEEDLINGS**  
**DATE:**  
**OCTOBER 2014- OCTOBER 2018**

This project will be executed in partnership with the Ministry of Agriculture within the framework of the 40 million tree program, under the EU Agriculture and Rural Development Program (ARDP) and is financed by the EU and Jouzour Loubnan.

Jouzour Loubnan was selected for this project Toumet Niha in Jezzine, one of the regions most affected by deforestation in Lebanon. It constitutes a high potential ground to accomplish a multi-purpose reforestation initiative in line with the 40 million trees program launched by the Lebanese Government in December 2012, and steered by the Ministry of Agriculture in order to plant 40 million forest trees in public lands within the next 20 years.



Within the scope of this project, Jouzour Loubnan plans


- 1.** to increase the woodland area in Toumet Niha and participate in the restoration of its degraded high mountain eco-system in close partnership with the Jezzine municipality by planting 32,000 trees of native species and 4,000 seeds on a municipal land of approximately 400 dunums,
- 2.** to empower Jezzine municipality, to protect, manage, promote and benefit from the project and train its personnel at performing efficiently reforestation activities, while increasing its role in regional forestation development, and
- 3.** to promote environmental awareness by sensitizing the youth, locals and influential stakeholders and decision-makers to save Lebanon's natural resources and its forests, and by raising knowledge and environmental awareness on the multi-purpose forest functions for protection, restoration, conservation and economic development on a local, regional and national level.

Jouzour Loubnan has already worked in close collaboration with the local authorities and municipalities of the Southern region of Lebanon, namely Ebl el Saqi and Ainata. These initiatives have been a great success and they have left a positive impression and deep sense of gratitude from the local community.





# Spreading Awareness



Our nation's future relies on a well-educated public to look after the environment that sustains us. In this context Jouzour Loubnan has been partnering with many institution/organization/school etc. in order to spread the environmental awareness through students, scouts, professionals, or every other concerned person.

Even though we are a young NGO with only 14 members we manage to organize awareness sessions with all the interested persons or groups, and to participate in most of the fairs and exhibitions we get invited to.

So far, we've had many interventions for Scout du Liban and Guide du Liban and other Lebanese scouts. We have also intervened in different schools like SSCC Ain Najm, Broumana high school, Sainte Famille Fanar, etc.

The biggest project was held during January and February 2014 where we organized environmental educational sessions for 9 different schools in Keserwan (College Apotres Jounieh, St Louise Ajaltoun, St Joseph Antoura, SSCC Kfarhabab, German school Jounieh, Jesus & Mary school

Rabieh, St Michel school Sahel Alma and Lycee Amchit) in the context of a project launched by the French institution "l'Institut français de Jounieh".

In addition to these sessions we had the opportunity to participate in several Fairs and exhibitions, some of them listed below:

- Baabdat municipality green event on September 9th 2013
- LAU NGO fair on April 13,2011 and April 22nd,2013
- ABC mall green week on July 5,6 and 7, 2013
- Azadea Foundation green booths at Le Mall Dbayeh, Le Mall Saïda, Beirut Souks, and Le Mall Sin El Fil during the month of December 2014
- Leo Beirut Gate energy day at AUST Beirut on March 26th, 2014

We will keep on spreading the environmental awareness especially amongst the younger generations aiming for greener minds and a greener Lebanon.





# How to Get Involved



## **YOU ARE YOUNG AND MOTIVATED OR HAVE YOUNG AND MOTIVATED SPIRIT**

you can participate in our plantation campaigns. We announce them regularly on our website [www.jouzourloubnan.org](http://www.jouzourloubnan.org) and on our Jouzour Loubnan group on Facebook.

## **YOU ARE A COMPANY'S MANAGER,**

you can organize a planting campaign for the employees of your company and their families. These corporate events have been extremely appreciated by the companies to date. Typically, you arrive on the prepared site in the morning and after a short training, the campaign starts under the supervision of Jouzour Loubnan team assisted by professionals. It lasts for 2 to 3 hours after which, tired but happy, you would gather around a corporate lunch. It is an exciting team building event, and an awareness experience for all participants about the importance of protecting and developing our woodland heritage.

## **YOU ARE IN THE REAL ESTATE DEVELOPMENT FIELD**

you can join our special program: "1 m<sup>2</sup> of newly created forest for each m<sup>2</sup> built" for a marginal cost of 2\$/m<sup>2</sup> that can be shared with the acquirer. This program allows you to promote your environmental awareness image and can be used in all of your marketing and sales strategies and promotional materials. A certificate will be provided for each of your clients and your project will be referenced in all of our publications, on our website and our social networks. You may have as well free advertising in our annual magazine.

## **YOU ARE SOCIALLY OR POLITICALLY ACTIVE, INVOLVED OR INFLUENTIAL,**

you may assist in the political awakening of the Lebanese Government and its commitment to implement a serious plan in the regulatory field in the application of the law, in the protection and development of our woodland heritage.

**WE CANNOT FORGET THAT THE FIGHT FOR FORESTATION IS A WORLDWIDE FIGHT, EACH OF US CAN PARTICIPATE USING RECYCLED OR CERTIFIED PAPER, I.E. PAPER PRODUCED FROM SUSTAINABLE FORESTS. YOU CAN ALSO CONTRIBUTE BY SIMPLY USING BOTH SIDES OF THE PAPERS AND RECYCLING THEM AFTERWORD. NOT ONLY WILL YOU PARTICIPATE IN THE PROTECTION OF THE WORLDWIDE WOODLAND HERITAGE PROTECTION, BUT, IN ADDITION, YOUR RETURN ON INVESTMENT WILL BE LESS THAN 3 YEARS.**





# How to Get Involved





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# Jouzour Loubnan Laboratory

## CONTEXT

The regeneration and management of woodlands in the Mediterranean needs particular attention: the role of plant cover is essential for mitigating desertification processes.

Forestation is often limited to a narrow number of species which are easy to grow in nurseries. This practice greatly reduces levels of biodiversity and it is even more worrisome with regards to shrubs and minor hardwood which are the greater part of the Mediterranean woody flora.

Beside cedars and juniper, many other trees of economic and/or of ecological interest are present in Lebanese mountains. Restoring these ecosystems requires the use of dozens of plant species to rebuild strong and resilient ecosystems. Recent international research results highlighted the positive effects of biodiversity.

Unfortunately, there are few nurseries producing Lebanese native species. Learning how to propagate these 'new' plants properly, including those deserving a wider use as drought-tolerant, can be a great challenge as well as a powerful tool to combat desertification and enhance biodiversity.

## ACTIVITIES

To date, 200 different Lebanese native species were harvested in the wild according to predefined scientific protocols respecting a minimal number of plants and a minimum distance between contributing plants. Seeds were then cleaned, measured, weighted, dried and stocked at 4°C:

- Germination protocols were defined for 25 different species.
- More than 200 seedlings, grown in our germination room belonging to Juniperus, Cedrus, Abies, Quercus, were transferred to a nursery in Kfardebian to be used in our future campaigns in this region.
- More than 150 other seedlings were transferred to APJM (Association pour la Protection de Jabal Moussa) nurseries in accordance with our partnership agreement.
- Bulbs and rhizomes for more than 10 endemic or endangered species have been collected and stocked for ex-situ conservation as well as for a future botanic garden collection.

Moreover, before each plantation campaign with Cedrus libani trees, genetic tests were performed in the molecular biology laboratory of the Faculty of Science at Saint Joseph University to verify their Lebanese origin.

**JOUZOUR LOUBNAN TOOK THE INITIATIVE OF CREATING THE LABORATORY FOR SEED GERMINATION AND CONSERVATION (LSCG) DEDICATED TO THIS PURPOSE.**





# Seed Bank - Lebanon Flora



The launch of the new online database of Lebanese flora, [www.lebanon-flora.org](http://www.lebanon-flora.org), was held on Monday 25 November 2013 at 5pm at the Innovation and Sport campus of the University of Saint-Joseph (USJ), Damascus road, Beirut. In the presence of the French ambassador to Lebanon Mr. Patrice PAOLI, representative of the Ministry of Agriculture, Presidents of municipalities and officials from the University of Saint Joseph (deans and Directors of various institutions).

The event began with speeches by the dean of the Faculty of Science at USJ, Professor Toufic RIZK, the chancellor of USJ, Professor Salim DACCACHE and the president of the National Council of Scientific Research (CNRS), Professor George TOHME.

The director of the Faculty of Science's Department of Life and Earth Sciences at USJ, Dr. Magda BOU DAGHER KHARRAT presented and discussed the Lebanon e-flora database, its operations and its scientific importance.

The Lebanon e-flora website is a large, free access database of detailed information on Lebanese plant species, including, but not limited to, their altitudinal distribution, flowering period, presence in national nature reserves as well as numerous photographs and descriptions for easy identification.

The Mediterranean region is one of the biodiversity «hotspots» of the world but this is threatened by climate change and human activities. Lebanon, due to its complex topography and hydrography,

is rich in biodiversity with over 4,600 plant species identified. The benefits of this project are immense for both conservation and awareness. Centralisation of data and information on the location of rare or endemic plant species will result in a better understanding of Lebanese flora and this is essential to biodiversity management and conservation. Thus, Dr. BOU DAGHER KHARRAT also presented the launch in parallel with another project, funded by the Critical Ecosystem Partnership Fund (CEPF), for the creation of micro-reserves on sites identified as important for Lebanese flora.

This project has resulted in close cooperation between Lebanese scientists. Indeed, its creation is the result of a huge effort involving the works of ancient and contemporary botanists, the participation of twenty local researchers from different Lebanese institutions (universities, CNRS, NGOs) and images shared by walkers all over Lebanon from the sea to the highest summits. The Lebanon e-flora database is dynamic and constantly improving, with increasing information available and the involvement of more people, scientists and amateur botanists. In 2013, L'observatoire Libano-Français de l'environnement O-Life has hosted Lebanon e-flora as one of its core projects as a national database for flora in Lebanon and a model to develop database for biodiversity in Lebanon.

Previously inaccessible information on botany in Lebanon will now be available to everyone, anywhere in the world. One goal is to educate as many citizens as possible on the diversity of local flora as well as its fragility, heritage and medicinal importance and, finally, to involve everyone in this adventure to protect environmental biodiversity in Lebanon.





# Lab Activities

## ACTIVITY 1- THE PROJECT ECOPLANTMED

### THE PROJECT ECOPLANTMED:



«ECOLOGICAL use of native PLANTS for environmental restoration and sustainable development in the MEDiterranean region» is a joint Mediterranean initiative based on the collaboration among seed banks, research institutes and institutions dealing with native plant conservation and management. Lead by the CIHEAM -

Mediterranean Agronomic Institute of Chania (Greece, Kriti), Ecoplantmed is a partnership between: University of Cagliari (Italy, Sardegna), Saint Joseph University (Lebanon), Generalitat Valenciana, (Spain, Comunidad Valenciana) and National Research Institute for Rural Engineering, Water and Forestry (Tunisia, Ariana).

The project aims to contribute to halting the loss of biodiversity and to promote a sustainable development model in the Mediterranean region by enhancing the conservation of native plants and promoting their use in habitat restoration and the plant production sector.

ECOPLANTMED is co-financed by the European Union through the ENPI CBC Mediterranean Sea Basin Program with Grant contract Identification number 77/8 of 16.01.2014. The project was selected under the 2nd call for standard projects and addresses Priority 2: Promotion of environmental sustainability at the basin level, and Measure 2.1: Prevention and reduction of risk factors for the environment and enhancement of natural common heritage.

The project ECOPLANTMED total budget is 1.050 million Euro and it is financed, for an amount of 0.945 million Euro (%90), by the European Union (ENPI CBC Mediterranean Sea Basin Program) through the European Neighborhood and Partnership Instrument.





# Lab Activities

## ACTIVITY 1- THE PROJECT ECOPLANTMED

### CONTEXT:

Besides being one of the world's most bio-diverse regions, the Mediterranean Basin is also considered amongst the four most significantly altered biodiversity hotspots of the planet.

Many valuable native plants are threatened with extinction due to the degradation of their habitats and related environmental risks, which mainly originate from human activities. This inestimable natural heritage should therefore be protected and enhanced through the improvement of local actors management capacity in order to implement preventive measures able to combine economic purposes with ecological restoration.

Combating the loss of biodiversity and promoting a sustainable development model in both sides of the Mediterranean is the challenge that ECOPLANTMED project intends to face.

Local administrators will be encouraged to respect the commitments deriving from international conventions (such as the Convention on Biological Diversity) thanks to a common environmentally model significantly contributing to a joined development of the Mediterranean eco-region.

### SPECIFIC OBJECTIVE

To promote the conservation, enhancement and sustainable use of native plants of the Mediterranean for ecological restoration of degraded habitats and for the development of new economic sectors by improving the management capacity of local actors

The project is composed from 6 different Work Packages (WP). The work package 6 is coordinated by the Laboratory of Seed Germination and Conservation (LSGC) - Faculty of Science Saint Joseph University. WP6 has as objective the development of a restoration methodology, based on the use of local genetic resources.

In Lebanon, the pilot actions will be conducted in Kfardebian in very close collaboration with

Jouzour Loubnan.

The project focuses on the identification of the optimal procedures to make the use of native plant species favorable for both habitat restoration actions and establishment of green areas.

For this purpose 2400 cedars and Juniperus plantlets and many other selected taxa seeds will be planted following different protocols. The pilot projects will represent a good test bench for the reproducibility and applicability of the obtained results and the developed procedures in similar cases.

The Laboratory for Seed Germination and Conservation (LSGC) will receive equipment and means to help develop germination protocols for native species.

In this same context, Gianluigi Bacchetta - scientific director of the Centre for Biodiversity Conservation at the Department of Environmental and Life Sciences, University of Cagliari- visited the Saint Joseph University Faculty of Sciences.

During his visit, Bacchetta made a couple of presentations about some studies concerning the conservation of species for example, but also he helped Jouzour Loubnan planning for the development and growth of the 'Seed Germination and Conservation Laboratory' in order to turn it into a larger facility as well as professional germoplasm bank.





# Lab Activities

## ACTIVITY 2- JUNIPER TREE PROPAGATION AND GERMINATION

In Lebanon, natural regeneration of *Juniperus excelsa* is hindered due to several factors, mainly grazing. Low germination of seeds lead nurseries to follow other more expensive propagation techniques: such as vegetative cuttings that were mentioned in our previous issue.

That study was held in Jouzour Loubnan laboratory and two other local nurseries and financed by the Lebanon Reforestation Initiative (LRI) but didn't lead to a high survival rate due to many factors.

Therefore, developing a germination protocol suitable for Lebanon's conditions was of high priority. With Turkey having the same *Juniperus excelsa* species on a genetic level and same climatic conditions, adapting a germination protocol developed in Egirdir nursery is a first step to increase reforestation efforts of this species in Lebanon.

Considering the importance of this species for reforestation, LRI financed a trip to Egirdir, Turkey for Mr. Elie Rahme (Bcharreh nursery), Mr. Farouk Salman (AFDC), Ms. Joelle Saab (Jouzour Loubnan), Ms. Karma Bouazza (LRI) and Mr. Raymond Farhat (LRI) in order to learn the Juniper germination protocol and apply it in Lebanon.

The study is still ongoing at Jouzour Loubnan laboratory and in two local nurseries; the results will be published in our next issue.





# Conservation of forest genetic resources

Forests and trees enhance and protect landscapes, ecosystems and production systems. They provide goods and services which are essential to the survival and well-being of all humanity. Forest genetic resources (FGR) are the heritable materials maintained within and among tree and other woody plant species that are of actual or potential economic, environmental, scientific or societal value. FGR are essential for the adaptation and evolutionary processes of forests and trees as well as for improving their productivity.

The complexity of the position and form of the Lebanese mountains played a key role in the evolution and the persistence of some Mediterranean tree species. Factors that currently lead to high precipitation in Mount Lebanon also operated during the glacial period, moderating the impact of regional aridity on tree populations. Today, however, the role of these refugia in the persistence of relict species could be limited by rapid climatic change and human-induced land degradation.

The population size of Lebanon increased from 2.6 million in 1980 to 4.3 million in 2010. It is expected that the population will keep on increasing to reach 5.323 million in 2045 (United Nations, World Population Prospects: The 2012 Revision). Along with population growth, the demand for energy and wood products for both industrial and domestic uses is expected to increase by 40 percent in the next 20 years (globally). The demand for other forest-related goods (food, medicine, fodder and other commodities) is also predicted to increase. A major consequence of population pressure is land-use change. Forest conversion to crop and pasture land, together with overexploitation, selective harvesting and high tree mortality due to extreme climatic events, in combination with regeneration failure, can result in local population extinction and the loss of FGR (The state of the world's forest genetic resources - FAO-Rome -2014). Conservation and sustainable management of FGR is therefore a must to ensure that present and future generations continue to benefit from forests and trees. Loss of plant species or species genetic erosion in forest ecosystems is mostly due to conversion of forest to other land use types, overexploitation and effects of climate.

The best way to conserve FGR is in situ conservation, in naturally regenerated and planted forests. FGR management actions are usually undertaken at forest ecosystem, species (interspecific) or genetic (intraspecific) levels.

An array of biotechnological tools is contributing to this knowledge. Genetic diversity studies was already undertaken for the main coniferous species in Lebanon : *Cedrus libani* (Bou Dagher et al. 2007); *Juniperus excelsa* (Douaihy et al., 2011) *Abies cilicica* (Awad et al. 2014). The genetic diversity of the populations is evaluated and recommendations are made in order to use the adequate genetic material. Taking into consideration such information when choosing genetic resources for reforestation is a key issue for restoration success. It is judicious to target traits suitable for adaptation to varying environmental conditions, including those associated with climate change.

A high genetic diversity serves as a way for populations to adapt to changing environments. In tree improvement programs, biotechnology tools such as enhanced vegetative propagation techniques and marker-assisted tree selection are making significant contributions. Genomics is also being used in forestry as a tool to enhance conservation, for example through the development of DNA banks. Biotechnology offers innovative means of controlling illegal forest harvesting, with DNA fingerprints (barcoding) now used in timber tracking and export and import of seeds and plantlets for reforestation.



# More Initiatives



## APJM



The Association for the Protection of Jabal Moussa (APJM), managing authority of the Jabal Moussa Biosphere Reserve, is presenting its native tree nursery program.

We are growing native tree seedlings on local scale - three households in three villages surrounding Jabal Moussa gain an extra income by renting their land to our association. With the initial funding by UNOPS, supplemented with equipment and technical know-how provided by the US forest service through the Lebanon Reforestation Initiative (LRI) we have become member of the first Lebanese nursery cooperative for native tree seedling production.

We are growing seedlings aiming at what we call the “target seedling” - supplying our crop with sufficient water and nutrients throughout the growing season, until the beginning of the hardening phase during which we decrease irrigation and nutrient supply. This allows us to stimulate the seedlings’ ability to survive in harsh

environments at plantation sites. By applying this method, we achieve a seedling quality that meets the standards set by the native tree nursery cooperative.

We are growing seedlings from our own seeds - sowing seeds that we collect ourselves from Jabal Moussa increases adaptation of planted trees to comparable sites throughout Lebanon. Funded by BLC Bank, a small laboratory for pre-treating seeds before sowing is currently under development and will help us improve seed quality in future. Our range of species, among which oaks, terebinth, wild almond and pear, ash and others, will be enlarged by such of more challenging nature and at the same time of a more critical status in terms of natural regeneration.

We are growing seedlings for a purpose - being committed to conservation, we want to contribute to efforts on national scale, and we do this through partners like Jouzour Loubnan and LRI. We are eager to increase our contribution in future by supplying projects like the forty-million-tree project to be carried out by the Lebanese Ministry of Agriculture.







# More Initiatives



## AEC

**arcenciel.aec**

arcenciel is a 28 year old non-profit organization working with and for the persons in difficulty, authorized on the 21st of November 1985 by the Lebanese Ministry of Interior and recognized of public utility on the 18th of November 1995. arcenciel overall mission is to participate to development. arcenciel is active through more than 13 centers throughout the Lebanese territory and through 8 programs: agriculture; employment; environment; health; mobility, social, tourism, and youth.

arcenciel's environment mission is the preservation and development of natural resources. This mission is achieved through two main fields of activity:

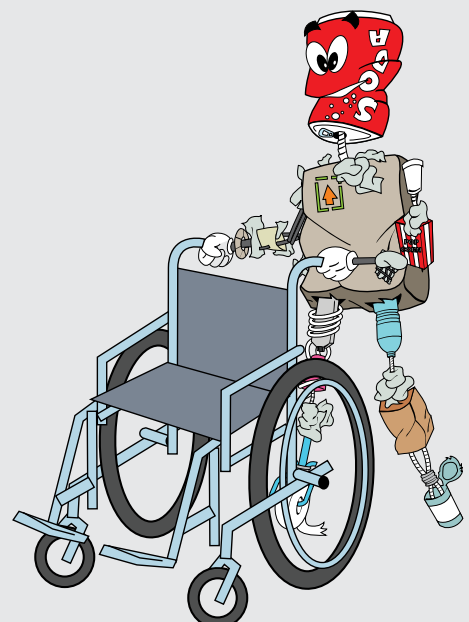
- Waste management
- Education and awareness of sustainable development

Since 2009, arcenciel is developing a solidarity-based network for recyclable waste management. Each ton of recyclable waste collected by the public and sold by arcenciel to

a recycling plant helps to finance social services and actions to persons in difficulty. Thanks to the public commitment, this project has led to very successful results, largely mobilizing and motivating the Lebanese population. Thus, 215 tons of waste were recycled and 30 social services were distributed in 2013!

By sorting and recycling your waste, you are participating in the three constituent parts of sustainable development:

- The environmental dimension: sorting out and recycling waste help in reducing pollution and preserving the environment.
- The social dimension: each ton of recyclable waste collected contributes to the achievement of a social action and helps in reducing the impact of waste on the people's health.
- The economical dimension: this solution ensures the creation of new job opportunities and helps promoting the local recycling factories.

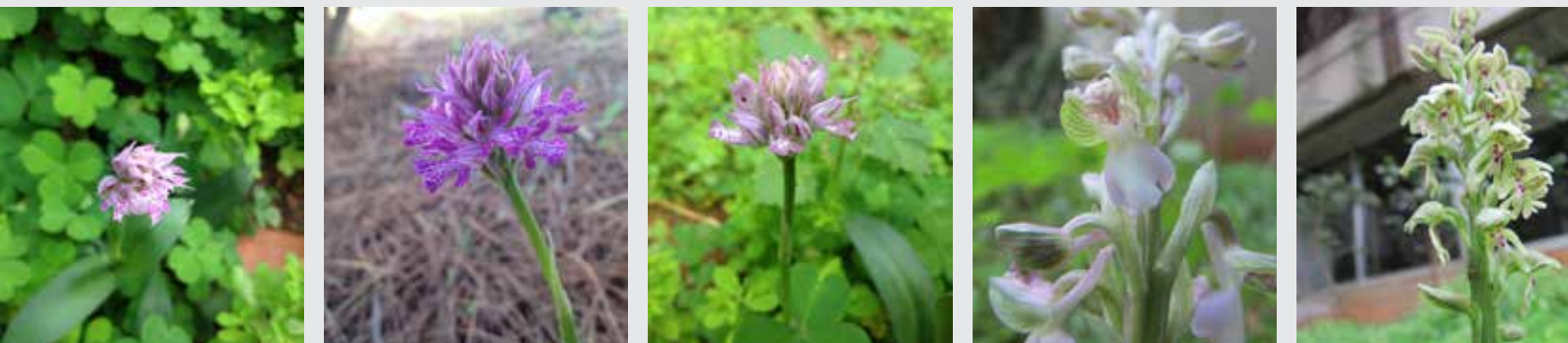




# More Initiatives



## OPÉRATION 7<sup>E</sup> JOUR



### A New Home...A New Life

Over a year ago, some small yet majestic orchids were threatened by an enormous urbanization project held on the Maten highway. Conscious of the danger surrounding these plants and under the aegis of the “Opération 7ème jour” of Saint Joseph University and in collaboration with Jouzour Loubnan, a campaign was organized by Mrs. Magda Bou Dagher Kharrat, Miss Rana El Zein and Mr. Jean Stephan with some USJ and Lebanese university students in order to save them. On a beautiful spring day the mission began and the volunteers were eager to give these orchids their best shot at survival, therefore they worked really hard and were able to gather up to 160 orchids.

A new location ecologically similar to their old habitat was chosen. It was no other than the Science and Technology campus of the Saint Joseph University where they will be finally safe and just to be more cautious some warning signs were placed next to each orchid so that students can avoid stepping on them.

That day was the beginning of new journey for these orchids which had to overcome a lot of difficulties that came with the transplantation process. There was nothing else the team could do but hope that it all worked out well.

As their flowering period approached the team was alerted and delighted to count more than 100 orchids so far and this transplantation was called a success to both the orchids and the team due to its circumstances and the challenges that faced them. It is noteworthy that some of the transplanted orchids had the opportunity to release their tiny seeds in the new campus and germinated as well this year.

Each and every volunteer made a choice that day, a choice to lead others by example and to save what's left of our green treasure in ambition that others will join the flow too.

- opportunities and helps promoting the local recycling factories.





# More Initiatives



## TERRE LIBAN

As far as waste management is concerned, three leading projects have formulated the corner stone of T.E.R.R.E.Liban namely: Papivore Malin, Nisr Campaign and Lebanese Ecitizen. The key goals of these projects include raising awareness, promoting ecological education, TOT building and introducing new ages of trainers amongst communities for better generations and societies.



### 1. PAPIVORE MALIN

In 1995, T.E.R.R.E.Liban launched Papivore Malin as a nationwide campaign aiming to raise awareness on waste paper sorting and recycling amongst young generation and reaching out the utmost number of people and communities. Our main activities covered schools in general. A truck was offered by UNICEF in 2008 to enforce the association accelerate the collection activities what enable us to collect about 600 tons paper waste from up to 500 enterprises- Universities, Schools, Banks, Hotels, etc.



public schools all over the Lebanese territories, an environmental recycling project. Launched in 2008, NISR Campaign was an ecological multipurpose project aiming at educating people on sorting at source- organic waste, waste paper and other recyclables. Operations and activities covered mainly awareness lectures, training of trainers, waste sorting and paper collection in elementary and intermediate cycles, with ecological award in return for participation and contribution where we could successfully attain more than 1100 public schools in Lebanon.



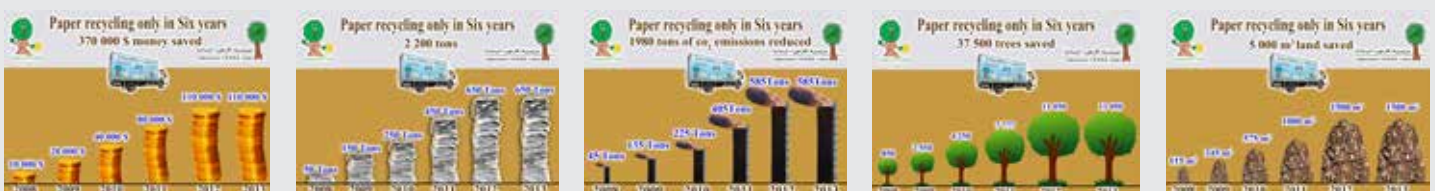
### 2. NISR CAMPAIGN



Armed with public support and official authorization- Governmental Decree nb 3206 / February 4, 2010, T.E.R.R.E.Liban has been planning, managing and implementing NISR in

### EXECUTED ACTIVITIES

- 1,139 schools have adopted the 3Rs principles: Reduce, Reuse and Recycle.
- 300,000 students were environmentally aware and engaged.
- Tons of paper trashes were recycled and thousands of trees saved.
- Organic wastes were turned into fertilizer in rural areas.
- Non-organic waste were sent or sold to the nearest recycling factories.





# More Initiatives



## UNDP

### Safeguarding and Restoring Lebanon's Woodland Resources Project (MOE - UNDP - GEF)



The Safeguarding and Restoring Lebanon's Woodland Resources (SRLWR) Project was launched in 2009 by the Lebanese Ministry of Environment (MOE) in coordination with UNDP and the co-financing of the Lebanese government and the Global Environment Facility (GEF).

One of the main objectives of the project is to investigate several innovative techniques which had not ever been applied and tested in Lebanon, aiming at the adoption of these successful and low cost methods in forthcoming large-scale reforestation activities at the national level.

Throughout its lifetime, the SRLWR project implemented three sets of trials in 7 different pilot sites on new technologies, aiming to reach successful, low cost & no-irrigation reforestation in Lebanon. Data gathered has been analyzed in coordination with Jouzour Loubnan and several forestry experts (international and local). Out of the total of 18 different treatments applied, 9 methods were proven successful and less expensive than the currently estimated cost of 7,000 USD/Ha for a planting density of 800 seedlings/Ha (as recommended by the MOE). In fact, the cost of the least expensive treatment tested by the project went down to 1,387 USD/Ha.

It is worth noting that this treatment involved direct sowing of seeds and acorns at specific timings and conditions with no irrigation at all. Data collected is currently being re-checked and analyzed by an international expert and final results and recommendations on the best practices suiting Lebanese conditions will be

published and disseminated by end 2014. Meanwhile, the project has already implemented several large scale reforestation activities based on best successful and low cost practices resulted from the project trials in 8 regions of the country to set a successful example for all partners who wish adopting these practices in carrying out their own reforestation campaigns.

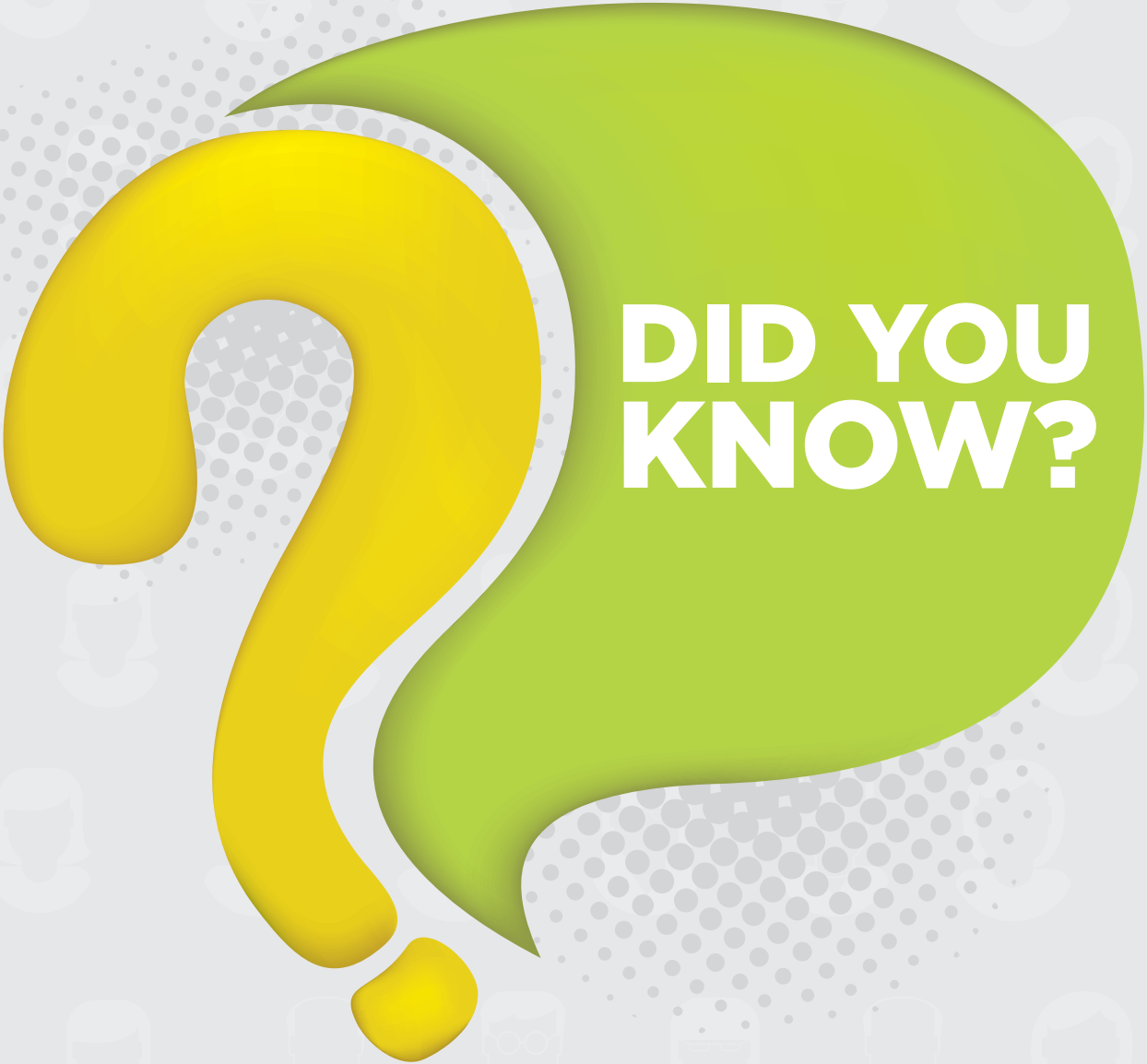
In parallel, the project provided technical assistance to the local forest tree seedling production nurseries, coordinating around 10



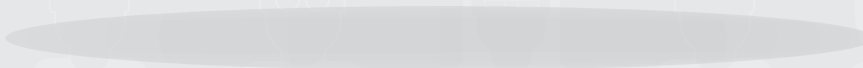
training modules undertaken by international experts and organizing several custom training sessions both in Lebanon and abroad, targeting specific important topics as requested by the local nurseries.

The project has also published illustrated technical brochures on the 10 most important native trees of Lebanon in Arabic & English languages.





**DID YOU  
KNOW?**





## DEEPEST ROOTS

A Wild Fig tree at Echo Caves, near Ohrigstad, Mpumalanga, South Africa has roots reaching 400 feet making it the deepest a tree's roots have penetrated.

## THE FASTEST GROWING TREE

In 1974, it was noted that an *Albizia falcata* in Sabah, Malaysia had grown 35 feet and 3 inches in 13 months: an approximate of 1.1 inches per day.

## THE GREATEST GIRTH

In the late 18th century a European Chestnut known as the Tree of the Hundred Horses on Mount Etna in Sicily, in Italy had a circumference of 190 feet. It has since separated into three parts.

## THE MOST DANGEROUS TREE

The Manchineel Tree of the Caribbean coast and the Florida Everglades is a species that secretes an exceptionally poisonous and acid sap. Upon contact to the skin, a break out of blisters would occur. In the occasions where there is contact to the eye, a person can be blinded, and a bite of its fruit causes blistering and severe pain. This tree has been feared ever since the Spanish explorers came to the Americas in the 16th century.

## THE MOST MASSIVE TREE

The "Lindsey Creek Tree", a Coast Redwood with a minimum trunk volume of 90,000 cubic feet and a minimum total mass of 3630 tons was the most massive known tree until it blew over in a storm in 1905. The most massive living tree is "General Sherman", a giant sequoia found in the Sequoia National Park in California. It is 275 feet tall with a girth of 102 feet and 8 inches.

## THE OLDEST TREE

Found in the Prairie Creek Redwoods State Park in California, the oldest tree recognized is a Redwood known as Eternal God. The tree is believed to be 12,000 years old, although it is argued as being only 7,000 years old, which still makes it the oldest.

## THE SLOWEST GROWING TREE

A White Cedar located in the Great Lakes area of Canada, has only grown to less than 4 inches tall during its 155 years.

## THE TALLEST TREE

In 1872, an Australian Eucalyptus at Watts River, Victoria in Australia was said to measure to 435 feet, but it is speculated that it probably measured to over 500 feet at some point in its life. The tallest living tree is a Coast Redwood known as the "Mendocino Tree" found in Montgomery State Reserve in California. This tree, which is over 1000 years old, is more than 367 feet and 6 inches tall and still growing

# Naturally Evolving

*The tree is a slow, enduring force straining to win the sky.*  
Antoine de Saint-Exupéry, The Wisdom of the Sands



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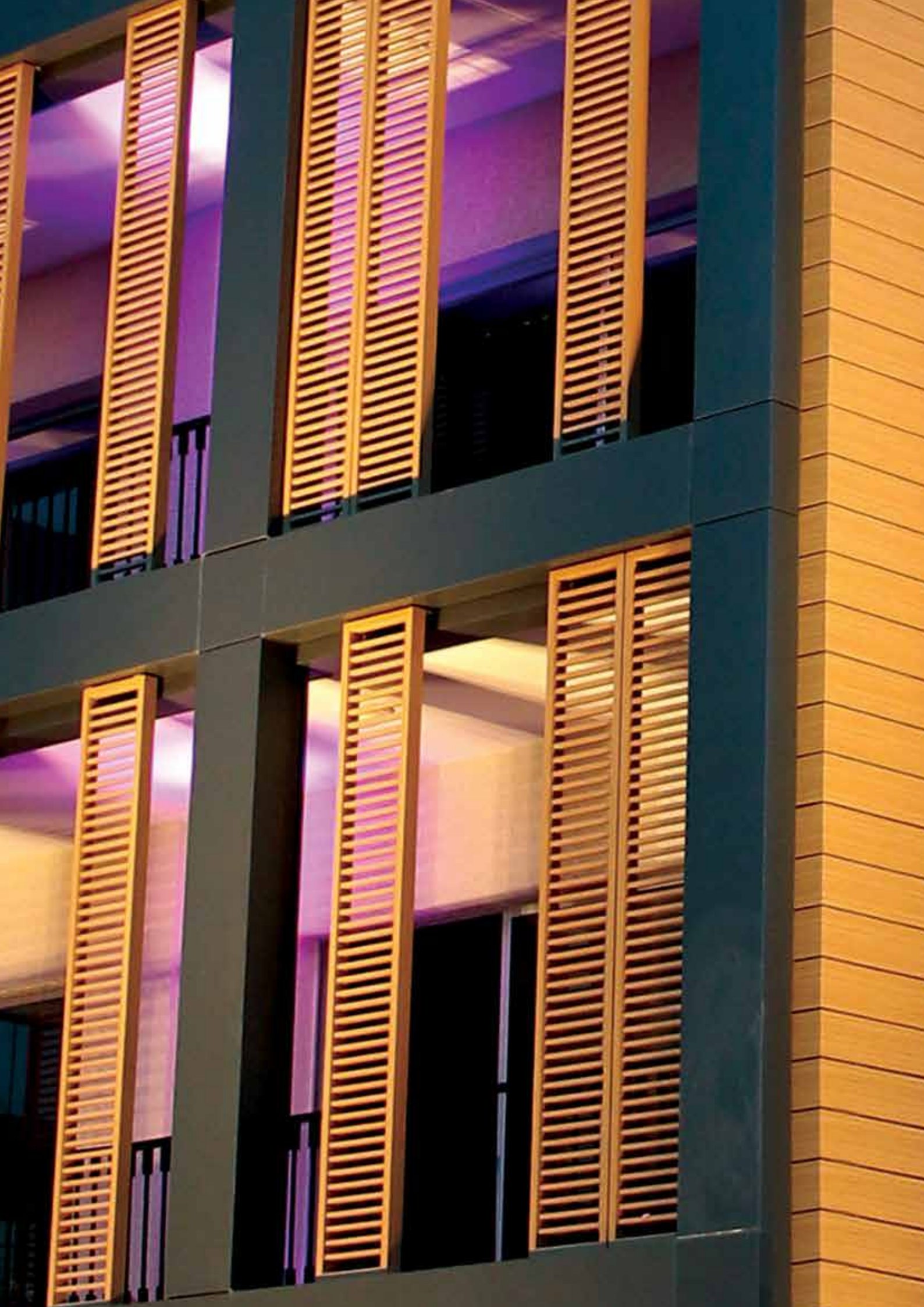
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## **CEDARS BOX : Adoption Kit**

Thanks to the “CEDARS BOX”, (a concept developed by Clement Tannouri), contributing to the preservation of the Cedar of Lebanon and the reforestation of the country’s largest natural heritage, is now Simpler than Ever. Indeed, “CEDARS BOX” gives you the opportunity to adopt a Cedar Tree, give it a Life and a Land on which it can grow so that in turn, it becomes a witness to our existence and history.

No need to have a green thumb or to climb mountains. In fact, it is the association “Jouzour Loubnan” that will plant the Cedar Tree that you will be adopting. And since the adoption is done online, all it requires is a simple click. “CEDARS BOX” is a generous gesture that is rich in meanings and importance and is within everyone’s reach.

For more info: [info@cedarsbox.com](mailto:info@cedarsbox.com)

## **CEDARS BOX : Ready to Plant**







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OF OUR LEBANESE HERITAGE  
*are rock-steady*



In 2013, Cimenterie Nationale was honored to participate in the renovation of Deir Al Natour, the iconic Enfeh monastery that was built by the Crusaders on Byzantine ruins over 900 years ago. The renovations were all carried out in keeping with the integrity of the original architectural style. It gave us great pleasure to breathe new life into Deir Al Natour as part of our ongoing CSR initiatives.

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