



Joun Development Projects Series

**Proposal to Construct a Fire
Station in the Jurisdiction of
Each Union of Municipalities in
Lebanon: The Town of Joun**

2025 - 2030

Strategy for Safeguarding Lebanon's Forests, protecting communities, and
mitigating the impact of wildfires: The Role of Local Governments

Developed by: Antoine J. Burkush, PhD

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Lebanon's Forests,
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Abstract

General Proposal to Construct a Fire Station in the
Jurisdiction of Each Union of Municipalities in Lebanon

Prepared by: Antoine J. Burkush, PhD

Contents

Acknowledgments	5
الشكر والتقدير	6
Preface	8
EXECUTIVE SUMMARY	11
PART ONE	12
INTRODUCTION	13
Governorates and Districts of Lebanon	13
About Al Chouf District:.....	14
Profile of Iqlim Al Kharroub in The Chouf District:	14
Fires of the Lebanese Mediterranean Ecosystem:.....	14
النيران تواصل التهام أحراج بإقليم الخروب في لبنان	15
لجنة البيئة: 99 % من الحرائق مفتعلة.....	15
اقرأ أيضاً	16
الحرائق تلتهم مساحات واسعة من أحراج لبنان وتقترب من المنازل	16
مأساة بيئية لبنانية... حريق يلتهم أكبر غابة صنوبر في الشرق الأوسط	16
NEXT: Maps of Lebanon: The Areas with risk of fires: Note the Joun, and Iqlim Al Kharroub area	17
Lebanon's forests: Dousing fire risks through stronger forest management.....	26
The Developmental Role of Municipalities' Unions in Northern Iqlim Al Kharroub.....	29
إقليم الخروب تغيب عنه الدولة والدور الاتماني لاتحاد بلدياته (الديار 28 أيلول).....	29
الحجار : وضعنا برنامج عمل حول واقع ومُستقبل الاقليم للسنوات المقبلة	29
The Role of the Lebanese Civil Defense: An Overburdened Department.....	33
Directorate General of the Lebanese Civil Defense	33
Scope of Responsibilities:	33
Civil Defense: Limitations of Firefighting Resources and Capabilities	36
Establishment of The Civil Defense Higher Committee	36
Recap and Closing Remarks.....	38
What are the general consequences of inadequate Resources and fire stations?	39
What additional measures can prevent future wildfires in Lebanon?	40
Safeguarding Lebanon's forests through fire prevention.....	41

Towards COP27:.....	42
Status of Lebanon’s Forest and Woodland Resources	45
The Need for Fire Stations.....	57
PART TWO.....	58
General Proposal to Construct a Fire Station in the Jurisdictions of Each Union of Municipalities in Lebanon.....	59
Fire Station Design: Recommendations for New Fire Stations in Lebanon:.....	59
Green Construction.....	59
Know the Town Community.....	59
Financial Obstacles.....	60
Four Planning Strategies.....	60
The 5 Essential Elements of the 21st Century Fire Station	60
The Fire Station Built for the Future: Energy-Efficient Designs	61
Co-Locations	61
Outdoor Recreational Areas.....	62
Rentable Public Spaces	62
Private Sleeping Quarters	62
Budget.....	62
Cost components of a typical Fire Station	64
Site Analysis Options Examples	65
Conclusion	67
BUSINESS PLAN FOR A FIRE DEPARTMENT IN JOUN.....	67
Executive Summary.....	67
Business Objectives	68
Services Offered	68
Market Analysis	68
Marketing Strategy.....	69
Operational Plan	70
Financial Plan	70
Funding Requirements.....	72
Implementation Timeline.....	72
Conclusion	73
BIBLIOGRAPHY	74

Governorates and Districts of Lebanon	74
References ^ "List of the Lebanese muhafazahs". Localiban. 17 May 2017. Retrieved 17 April 2021.	74
List of municipalities in The Chouf District	74
Article in Asharq Al Awsat Newspaper	74
النيران تواصل التهام أحراج بإقليم الخروب في لبنان	74
لجنة البيئة: 99 % من الحرائق مفتعلة.....	74
نُشر: 30-12:59 سبتمبر 2023 م - 16 ربيع الأول 1445 هـ	74
Maps of Lebanon: The Areas with risk of fires	74
The World Bank: Lebanon's forests: Dousing fire risks through stronger forest management	74
Safeguarding Lebanon's forests through fire prevention: Lebanon celebrates success in forest fire prevention with a 90% reduction in two years, but the country faces a new threat: deliberate fires burning southern regions. By EFIMED - June 19, 2024.....	75
Building a New Station: A Primer for Small Fire Departments	75
END OF THE DOCUMENT	75

Acknowledgments

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Special thanks to all whose contributions were instrumental in refining our vision.

To the local leaders and stakeholders who championed this project, your support has been a vital source of encouragement. Your leadership and understanding of Joun's unique challenges and opportunities have given depth to these proposals, grounding them in both our town's history and its potential for growth.

Finally, I would like to thank everyone who worked behind the scenes—whether gathering data, conducting research, or organizing meetings—your efforts have been crucial in bringing this work to life.

Together, we have created a roadmap for Joun's future that honors our heritage and inspires a brighter tomorrow. I am truly grateful to each of you for your contributions, enthusiasm, and dedication to this endeavor.

With sincere appreciation,

Dr Antoine J. Burkush, PhD

الشكر والتقدير

هذه المجموعة من المقترحات هي نتيجة رؤية مشتركة ورحلة تعاونية ، تسترشد بمدخلات وتفاني ورؤى عدد لا يحصى من الأفراد الذين يحملون جون قريبا من قلوبهم. لم يكن ذلك ممكنا بدون الدعم والمساهمات الثابتة من أعضاء المجتمع والخبراء وأصحاب المصلحة والقادة المحليين ، الذين قدم كل منهم وجهات نظره الفريدة إلى الطاولة.

أولا وقبل كل شيء، أعرب عن خالص امتناني لسكان جون، الذين كانت أصواتهم وأفكارهم وتطلعاتهم أساس هذا العمل. لقد كان استعدادك لمشاركة أفكارك وأحلامك لمدينتنا لا يقدر بثمن في تشكيل المقترحات التي تعكس حقا روح مجتمعنا وأهدافه. كانت مشاركتك في المناقشات والاستطلاعات والتجمعات المجتمعية شهادة على التزامك بمستقبل جون.

شكر خاص للذين كانت مساهماتهم مفيدة في صقل رؤيتنا.

إلى القادة المحليين وأصحاب المصلحة الذين دافعوا عن هذا المشروع ، كان دعمكم مصدرا حيويا للتشجيع. لقد أعطت قيادتكم وفهمك لتحديات وفرص جون الفريدة عمقا لهذه المقترحات ، مما جعلها راسخة في كل من تاريخ مدينتنا وإمكاناتها للنمو.

أخيرا ، أود أن أشكر كل من عمل وراء الكواليس - سواء في جمع البيانات أو إجراء البحوث أو تنظيم الاجتماعات - كانت جهودك حاسمة في إحياء هذا العمل.

معا ، أنشأنا خارطة طريق لمستقبل جون تكرم تراثنا وتلهم غدا أكثر إشراقا. أنا ممتن حقا لكل واحد منكم على مساهماتكم وحماسكم وتفانيكم في هذا المسعى.

مع خالص التقدير،

د. انطوان جان البرخش



مشاريع
مبادرات شخصية
"من أجل الصالح العام"

Joun Development Projects

"Pro Bono Publico"

Dr Antoine J. Burkush, PhD

رؤية واحدة، هوية واحدة، مجتمع واحد

Preface

In a world where rapid change is the new normal, the importance of strategic, sustainable, and community-centered development is paramount. Joun, with its rich cultural heritage, natural beauty, and resilient community, stands at a crossroads—one that presents both challenges and extraordinary opportunities. As we look toward Joun's future, it is essential that our plans honor the town's heritage, respond to today's needs, and set a course for future generations to thrive.

This series of proposals is the result of a deeply collaborative effort to envision Joun's path forward. Each plan reflects input from residents, local stakeholders, and community leaders, resulting in a shared vision that is both ambitious and respectful of our town's unique identity. These proposals encompass a comprehensive range of initiatives, from infrastructure and economic development to cultural preservation and environmental stewardship, with each component tailored to address Joun's specific strengths, challenges, and aspirations.

Our proposals emphasize a commitment to public infrastructure improvements, economic empowerment, environmental sustainability, and cultural continuity. From plans to enhance recreational facilities and community services to initiatives for sustainable tourism and green energy, each proposal aims to make Joun a model of progressive yet grounded development. The ultimate goal is to create a vibrant, inclusive, and resilient community—one that embodies the values, dreams, and talents of its people.

I extend my heartfelt gratitude to everyone who has contributed to this vision. Your dedication, ideas, and insight have been invaluable, illuminating the pathway to a future that aligns with Joun's core values while embracing growth and innovation. These proposals are an invitation to all residents of Joun to imagine, participate, and help build a community that harmonizes tradition with the possibilities of tomorrow.

As you review this collection, I encourage you to see not just plans, but a vision for what Joun can become. Let us move forward together, translating these ideas into action, and creating a brighter, thriving, and unified future for Joun.

With deep respect and optimism,

Dr Antoine J. Burkush, PhD

مقدمة

في عالم حيث التغيير السريع هو الوضع الطبيعي الجديد ، فإن أهمية التنمية الاستراتيجية والمستدامة التي تركز على المجتمع أمر بالغ الأهمية. تقف جون ، بتراتها الثقافي الغني وجمالها الطبيعي ومجتمعها المرن ، على مفترق طرق - مفترق طرق يمثل تحديات وفرصا غير عادية. بينما نتطلع إلى مستقبل جون ، من الضروري أن تكرم خططنا تراث المدينة ، وتستجيب لاحتياجات اليوم ، وتضع مسارا للأجيال القادمة لتزدهر.

هذه السلسلة من المقترحات هي نتيجة جهد تعاوني عميق لتصور مسار جون إلى الأمام. تعكس كل خطة مدخلات من السكان وأصحاب المصلحة المحليين وقادة المجتمع ، مما يؤدي إلى رؤية مشتركة طموحة وتحترم الهوية الفريدة لمدينتنا. تشمل هذه المقترحات مجموعة شاملة من المبادرات ، من البنية التحتية والتنمية الاقتصادية إلى الحفاظ على الثقافة والإشراف البيئي ، مع تصميم كل مكون لمعالجة نقاط القوة والتحديات والتطلعات المحددة لجون.

تؤكد مقترحاتنا على الالتزام بتحسين البنية التحتية العامة ، والتمكين الاقتصادي ، والاستدامة البيئية ، والاستمرارية الثقافية. من خطط تعزيز المرافق الترفيهية والخدمات المجتمعية إلى مبادرات السياحة المستدامة والطاقة الخضراء ، يهدف كل اقتراح إلى جعل جون نموذجا للتنمية التقدمية والمرتكزة. الهدف النهائي هو إنشاء مجتمع نابض بالحياة وشامل ومرن - مجتمع يجسد قيم وأحلام ومواهب شعبه.

وأعرب عن خالص امتناني لكل من ساهم في هذه الرؤية. لقد كان تفانيك وأفكارك ورؤيتك لا تقدر بثمن ، مما يضيء الطريق إلى مستقبل يتماشى مع القيم الأساسية لجون مع احتضان النمو والابتكار. هذه المقترحات هي دعوة لجميع سكان جون للتخيل والمشاركة والمساعدة في بناء مجتمع ينسق التقاليد مع إمكانيات الغد.

أثناء مراجعتك لهذه المجموعة ، أشجعك على رؤية ليس فقط الخطط ، ولكن رؤية لما يمكن أن يصبح عليه جون. دعونا نمضي قدما معا، ونترجم هذه الأفكار إلى أفعال، ونخلق مستقبلا أكثر إشراقا وازدهارا وموحدا لجون.

مع الاحترام العميق والتفاؤل،

د. انطوان جان البرخش

**General Proposal to Construct a Fire Station in
the Jurisdiction of Each Union of Municipalities
in Lebanon**

EXECUTIVE SUMMARY

The proposal to construct a new fire station in the town of Joun (or its vicinity), one of Mount Lebanon's municipalities is based on the growing population and the need for more efficient and quieter neighborhoods. The fire stations are often located away from these new population centers due to the unaffordability of prime real estate and the "not in my backyard" attitude of residents. The proposal recommends green construction and energy-saving technologies to reduce the community's carbon footprint and operating costs.

The proposal also acknowledges that Lebanon's current economic situation may not be financially feasible for a new fire station. To maximize the budget, four planning strategies are suggested: collaborating with other municipalities or departments, town community groups, creating a training facility within the station, and collaborating with neighboring fire departments. The proposal also highlights the five essential elements of a modern-day fire station: apparatus bays, sleeping quarters, residential areas, recreational facilities, and training facilities.

Sustainable design strategies are increasingly being used in building fire stations, aiming to reduce energy consumption and costs. These include incorporating green roofs, energy-efficient windows and water fixtures, solar power, and energy-efficient lighting. Combining fire and police stations into co-locations can also help reduce construction costs. Outdoor recreational areas can be provided, and rentable public spaces can boost community engagement. Private sleeping quarters can promote better sleep habits and mental health, making firefighters better at their jobs.

Estimating the cost of building a fire station involves several factors, including location, size, design, and specific requirements. Cost components include land acquisition, construction costs, utilities, firefighting equipment, apparatus bay, living quarters, safety measures, architectural and engineering fees, furnishings and fixtures, landscaping and parking, and contingency.

In summary, the proposal concludes that fire stations must be equipped and organized to promote quick response times while also meeting the daily needs of the firefighters. From renovations to new structures, there are many ways to improve the efficiency and effectiveness of fire stations. By incorporating sustainable design strategies, combining fire and police resources, and providing private sleeping quarters, fire stations can create a more sustainable and efficient environment for their firefighters and the community.

PART ONE

INTRODUCTION

Governorates and Districts of Lebanon

The nine governorates of Lebanon are subdivided into 25 districts (Aqdy, singular – qadaa). Beirut Governorate is not subdivided into districts, and Akkar Governorate comprises a single district. [1]

The districts are further divided into municipalities.



- | | |
|--|--|
| <p>1. Akkar Governorate (Halba)</p> <ul style="list-style-type: none"> • Akkar (Halba) | <ul style="list-style-type: none"> • Baabda (Baabda) |
| <p>2. Baalbek-Hermel Governorate (Baalbek)</p> <ul style="list-style-type: none"> • Baalbek (Baalbek) • Hermel (Hermel) | <ul style="list-style-type: none"> • Chouf (Beiteddine) • Matn/Metn (Jdeideh) |
| <p>3. Beirut Governorate (Beirut)</p> | <p>7. Nabatieh Governorate (Nabatieh)</p> <ul style="list-style-type: none"> • Bint Jbeil (Bint Jbeil) • Hasbaya (Hasbaya) • Marjeyoun (Marjeyoun) • Nabatieh (Nabatieh) |
| <p>4. Beqaa Governorate (Zahlé)</p> <ul style="list-style-type: none"> • Rashaya (Rashaya) • Western Beqaa (Joub Jannine - winter / Saghbine - summer) • Zahlé (Zahlé) | <p>8. North Governorate (Tripoli)</p> <ul style="list-style-type: none"> • Batroun (Batroun) • Bsharri (Bsharri) • Koura (Amioun) • Miniyeh-Danniyeh District (Miniyeh) • Tripoli (Tripoli) • Zgharta (Zgharta) |
| <p>5. Keserwan-Jbeil Governorate (Jounieh)</p> <ul style="list-style-type: none"> • Byblos (Byblos) • Keserwan (Jounieh) | <p>9. South Governorate (Sidon)</p> <ul style="list-style-type: none"> • Sidon (Sidon) • Jezzine (Jezzine) • Tyre (Tyre) |
| <p>6. Mount Lebanon Governorate (Baabda)</p> <ul style="list-style-type: none"> • Aley (Aley) | |

About Al Chouf District:

The 26 districts of Lebanon are subdivided into municipalities.

Ain Kani	Dalhoun	Kfarniss
Ain Wzein	Damour	Khraybeh
Ain Zhalta	Daraya	Knayse
Ainbal	Debbieh	Maasser Beiteddine
Amatour	Deir Dourit	Maasser el Chouf
Ammik	Deir el Kamar	Majdel Meouch
Anout	Deir Kouche	Mazboud
Atrine	Dmit	Mazraat el Chouf
Baakline	Fouara	Mazraat el Daher
Baasir	Gharife	Mechref
Baatharan	Haret Jandal	Mghayrie
Barja	Hasrout	Mokhtara
Barouk – Freydiss	Jadra	Mristeh
Bater	Jahlieh	Naameh
Batloun	Jbeih	Niha Chouf
Bchetfine	Jdeidet el Chouf	Rmayle
Beiteddine	Jiyeh	Seblin
Berjein & Mreyjat	Joun	Semkanieh
Bireh	Kahlounie	Serjbeil
Botme	Ketermaya	Wadi Sit
Bsaba El Chouf	Kfarfakoud	Warhanieh
Chehim	Kfarhim	Werdanieh
Daher el Mghara	Kfarkatra	Zaarourieh
	Kfarnabrakh	

Profile of Iqlim Al Kharroub in The Chouf District:

- 167 sq. km
- Pop 140,000

Fires of the Lebanese Mediterranean Ecosystem:

Fire is a recurrent disturbance in Mediterranean ecosystems. Data assemblage from forest fire services can provide useful information for understanding climate controls on daily fire hazard or long term trends. Located at the driest range of the Mediterranean bio climate, and with contrasting socio-political systems compared to the European area, the southern Mediterranean ecosystems are subjected to more extreme climate and social events.

This could potentially lead to unique fire regimes and trends worth being characterized for prevention plans and ecosystem management. However, the region is far less documented, due to **missing or inhomogeneous fire records, leaving local authorities with no management strategies when large fires happen**. We filled this knowledge gap for Lebanon by combining high spatial resolution Landsat data with high temporal resolution VIIRS (S-NPP and NOAA-20) and MODIS (MCD14ML) hotspots to characterize the seasonal and inter-annual fire regime over the 2001–2020 period.

Numerous small fires were hardly detected by global remote sensing. We estimated that **2044 ha burn annually**, representing 0.58% of the wildland cover, with no significant trend over the period, but with non-climate-related fires detected during the year experiencing socio-political troubles. The spatial and temporal resolution of this dataset identified a particular prolonged fire season up to November, and an unusual bimodal fire season peaking in July and November.

We related these features to the prolonged autumnal soil drought and high August air humidity in the region. This updated fire regime in Lebanon illustrates the benefits of this combined approach for **data-scarce regions** and provides new insights on the variability of fire weather types in the Mediterranean basin.

النيران تواصل التهام أحراج بإقليم الخروب في لبنان

لجنة البيئة: 99 % من الحرائق مفتعلة

لينا صالح: بيروت

نُشر: 12:59-30 سبتمبر 2023 م - 16 ربيع الأول 1445 هـ

لليوم الثاني على التوالي، لا تزال النيران مشتعلة في الأحراج الفاصلة بين بلدي بعاصير والديبية في منطقة إقليم الخروب (قضاء الشوف) بجبل لبنان، وذلك رغم الجهود الكبيرة، التي بذلتها عناصر الدفاع المدني وطوافتان للجيش طوال نهار أمس، «حسبما أكدت «الوكالة الوطنية للإعلام

وتم إخماد مساحات كبيرة من الحريق، اليوم (السبت)، إلا أن صعوبة المنطقة ووعورتها، وعدم وجود طرق توصل إلى مواقع الحريق، حالت من السيطرة على النيران، في ظل تسارع حركة الرياح، التي ساهمت في توسع رقعتها، وهي ما زالت مشتعلة في الأودية التي من الصعب الوصول إليها، رغم الاستنفار الكامل للدفاع المدني وجاهزيته وحضوره على الأرض لتنفيذ المهمات

وفي حديث للشرق الاوسط يوضح رئيس لجنة البيئة النيابية، النائب غياث يزبك أن «امكانات الدفاع المدني نظرا للظروف الاقتصادية الصعبة ونظرا لكون ألياته نفسها متهالكة ولم يتم تحديثها منذ 25 سنة، يواجه صعوبة في معالجة الحرائق حتى «لو كانت بسيطة، وبالتالي الامر يكون اصعب في معالجة الحرائق الكبيرة والمفتعلة

كما يتمنى «وصول موجة الشتاء، المتوقعة في لبنان يوم الأحد، في وقت أقرب، لمساعدة فرق الدفاع المدني بتطهير الأرض «وإطفاء الحرائق

النيران تلتهم المساحات الخضراء في إقليم الخروب (وسائل إعلام محلية)

وكان المدير الإقليمي للدفاع المدني في جبل لبنان الجنوبي، الموجود بالقرب من مواقع الحريق في الدبية، حسام دحروج، منذ الصباح الباكر، قد أكد أنه يتواصل مع المديرية العامة للدفاع المدني، طلباً للمساعدة عبر الاستعانة بمراكز أخرى للسيطرة على الحريق، الذي بات يهدد المنطقة وأهلها، لافتاً إلى أن النيران المشتعلة في أودية بعاصير والدبية لا يمكن الوصول إليها وإخمادها إلا عبر طوافات الجيش.

ويسجل لبنان سنوياً موجة حرائق في مختلف الغابات المنتشرة في عدد من البلدات، وتقدر خسائر المساحات الزراعية بألوف الهكتارات، وسط تضاعف الخشية من استحالة مواجهتها.

اقرأ أيضاً

الحرائق تلتهم مساحات واسعة من أحراج لبنان وتقترب من المنازل

مأساة بيئية لبنانية... حريق يلتهم أكبر غابة صنوبر في الشرق الأوسط

وفي أكتوبر (تشرين الأول) 2019، التهمت حرائق ضخمة مساحات حرجية واسعة، وحاصرت مدنيين في منازلهم وسط عجز السلطات التي تلقت دعماً من دول عدة لإخمادها، ما عدّه اللبنانيون حينذاك دليلاً إضافياً على إهمال وعدم كفاءة السلطات.

وآثارت تلك الحرائق غضباً واسعاً حتى إنها شكلت أحد الأسباب خلف الاحتجاجات الشعبية غير المسبوقة التي شهدتها لبنان في 17 أكتوبر 2019، والمعروفة بـ«ثورة تشرين» ضد الطبقة السياسية.

وعام 2022، عاش لبنان مأساة بيئية أخرى، بعدما اندلع حريق في غابات بطرماز - الضنية (شمال لبنان)، وهي أكبر غابة صنوبر بري في الشرق الأوسط.

ويؤكد يزبك أن «99.99 في المائة من الحرائق في لبنان إما مفتعلة، أو عن إهمال متعمد وعدم اكتراث بالبيئة من قبل اللبنانيين».

وعادة ما تكثر الحرائق في لبنان في شهري سبتمبر (أيلول) وأكتوبر، وغالباً ما تكون مفتعلة في هذا الموسم للحصول على الحطب وبيعه مقابل مبالغ مرتفعة. وفي هذا الإطار، يشرح يزبك أن العشب اليابس يصبح أشبه بالوقود، مع انتهاء فصل الصيف، أي شرارة تتسبب باشتعاله.

وإذ يشير إلى أن نسبة الحرائق المفتعلة جرمياً للحصول على الحطب هي الأساس الأكبر لاشتعال الحرائق، يقول: «طن الحطب يباع بحوالي 250 دولاراً، وما يحصل أن أصحاب الأملاك يتواطأون مع الحطابين الذين يتعهدون الأجر، والذين يمارسون نوعاً من التوحش في العملية، فالبعض يقصون الأشجار في قطعة الأرض المرخص لها، ويتوسعون إلى الأراضي المجاورة من أجل الحصول على أموال أكثر».

ويضيف: «أما المناطق التي لا توجد فيها رخصة فيشعلون النار فيها للحصول على الحطب. والعملية جرمية بامتياز بحجة الحاجة إلى المال».

لكن يربك يلفت إلى أن الحرائق انخفضت بنسبة 80 أو 90 في المائة هذا العام مقارنة مع السنوات السابقة بفضل الوعي لدى الناس الذي ساهمت فيه لجنة البيئة ووزارة البيئة والإعلام

أضف إلى ذلك، يشير يربك، إلى أنه في ظل الأزمة البشرية والتقنية التي يعاني منها الدفاع المدني، وجد في كل المناطق والأطراف والضيع نوع من فرق التبليغ الأولى عن الحرائق، كما تقوم بعض المناطق بمراقبة المساحات الحرجية فيها عبر طائرات الدرونز لإجراء مسح للتدخل السريع

ويضيف: «هذه الخطوات ساهمت في تقليل حدوث الحرائق في لبنان، واستطعنا المحافظة على بساطنا الأخضر وثروتنا الحرجية بسبب وعي الناس».

NEXT: Maps of Lebanon: The Areas with risk of fires: Note the Joun, and Iqlim Al Kharroub area

Figure 5. Geological map of Lebanon (Dubertret, 1955)

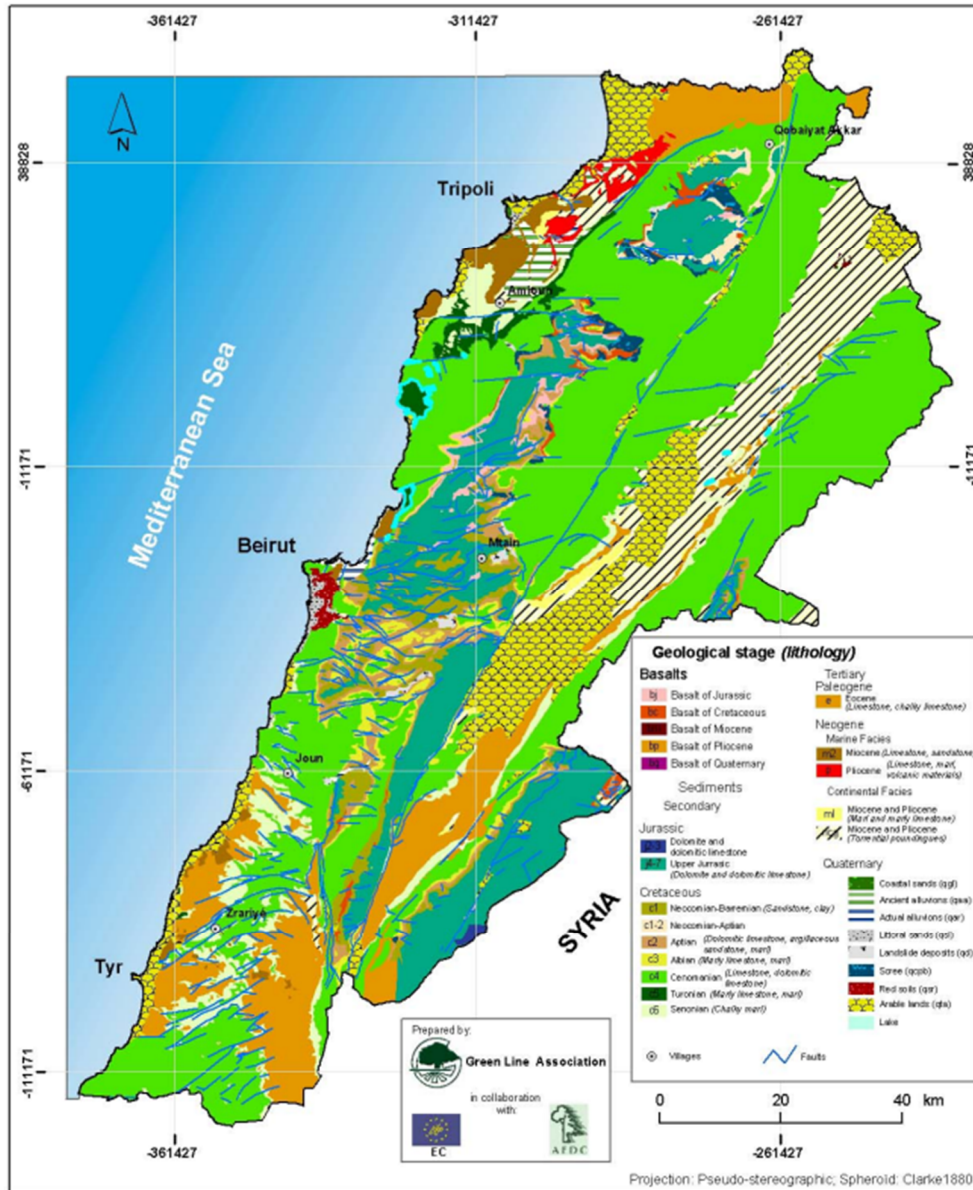


Figure 40. Slope gradient index fire map of Lebanon

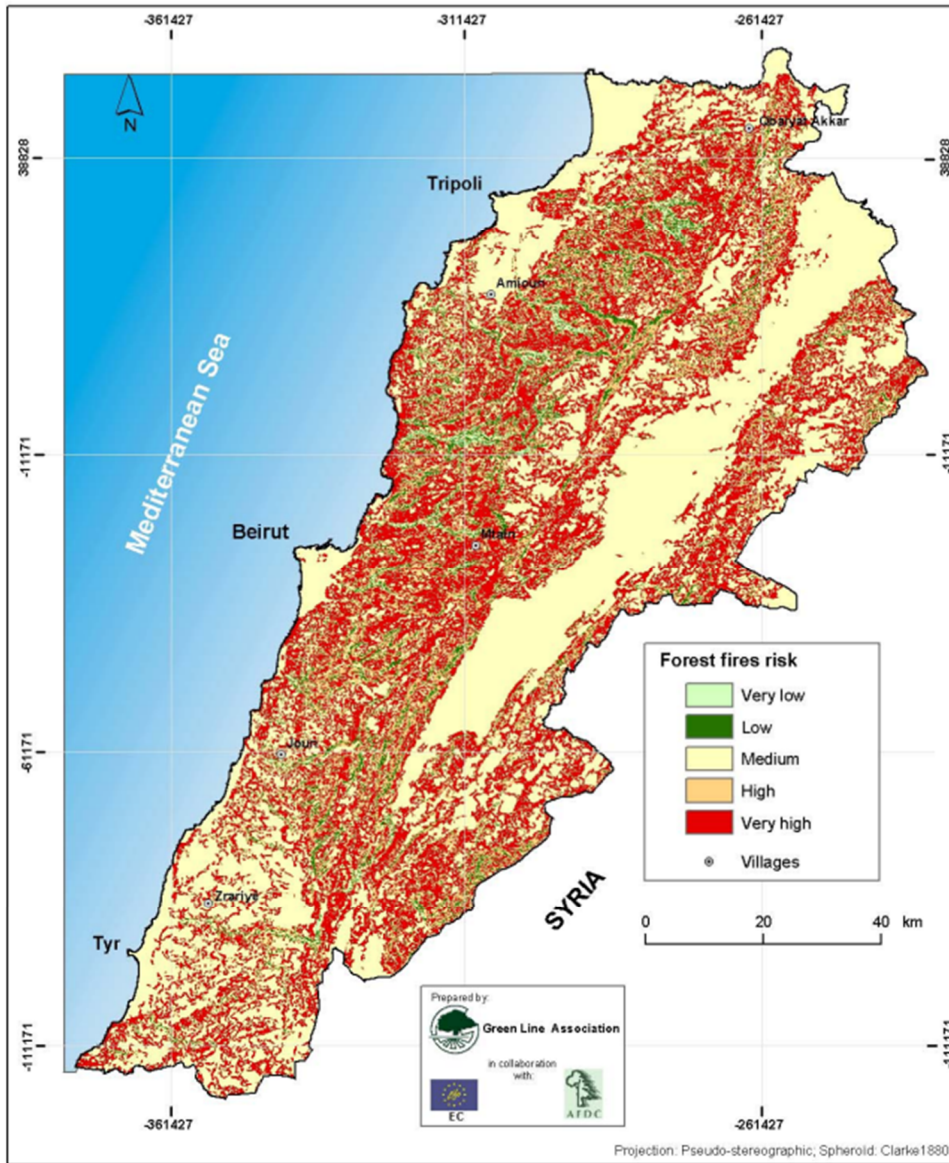


Figure 42. Evapotranspiration index fire map of Lebanon

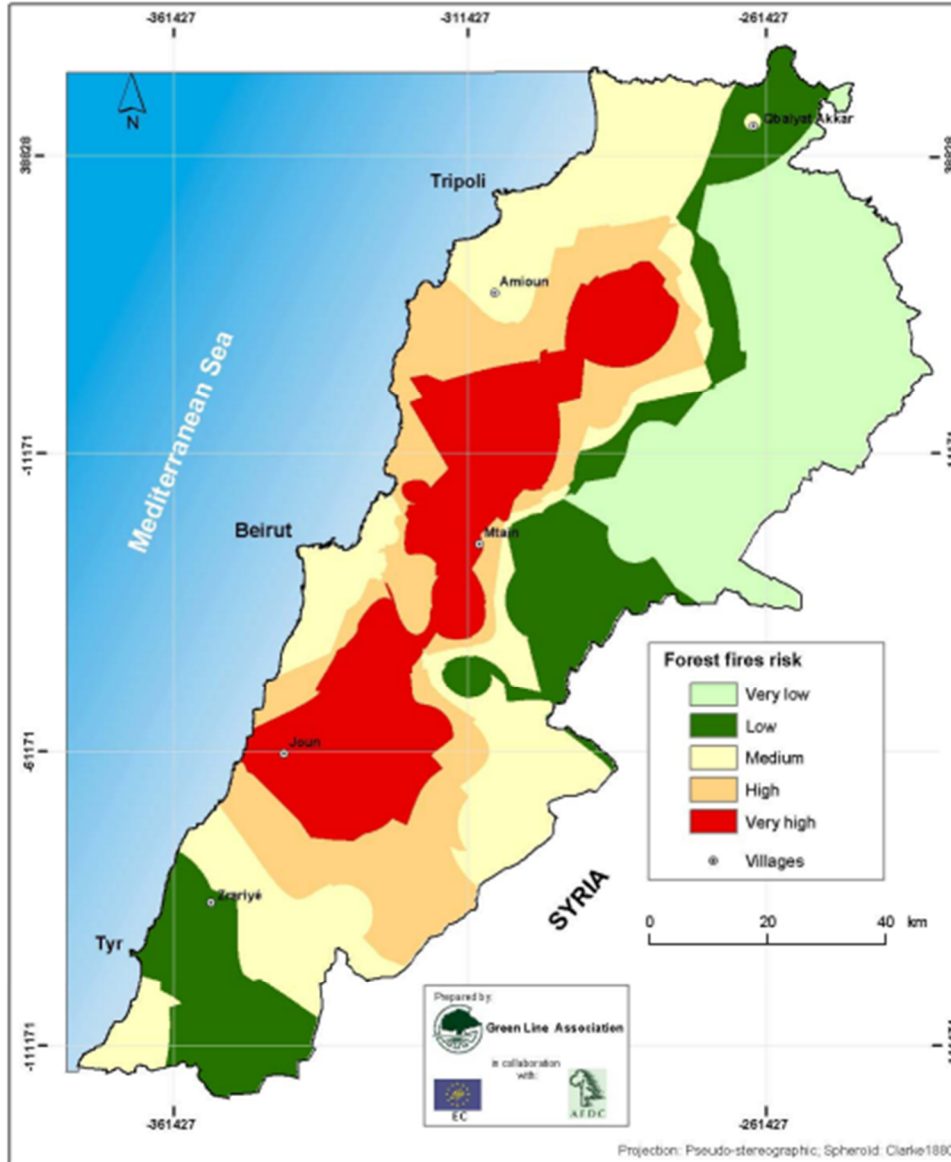


Figure 33. Map showing the mean time to control forest fires (2003)

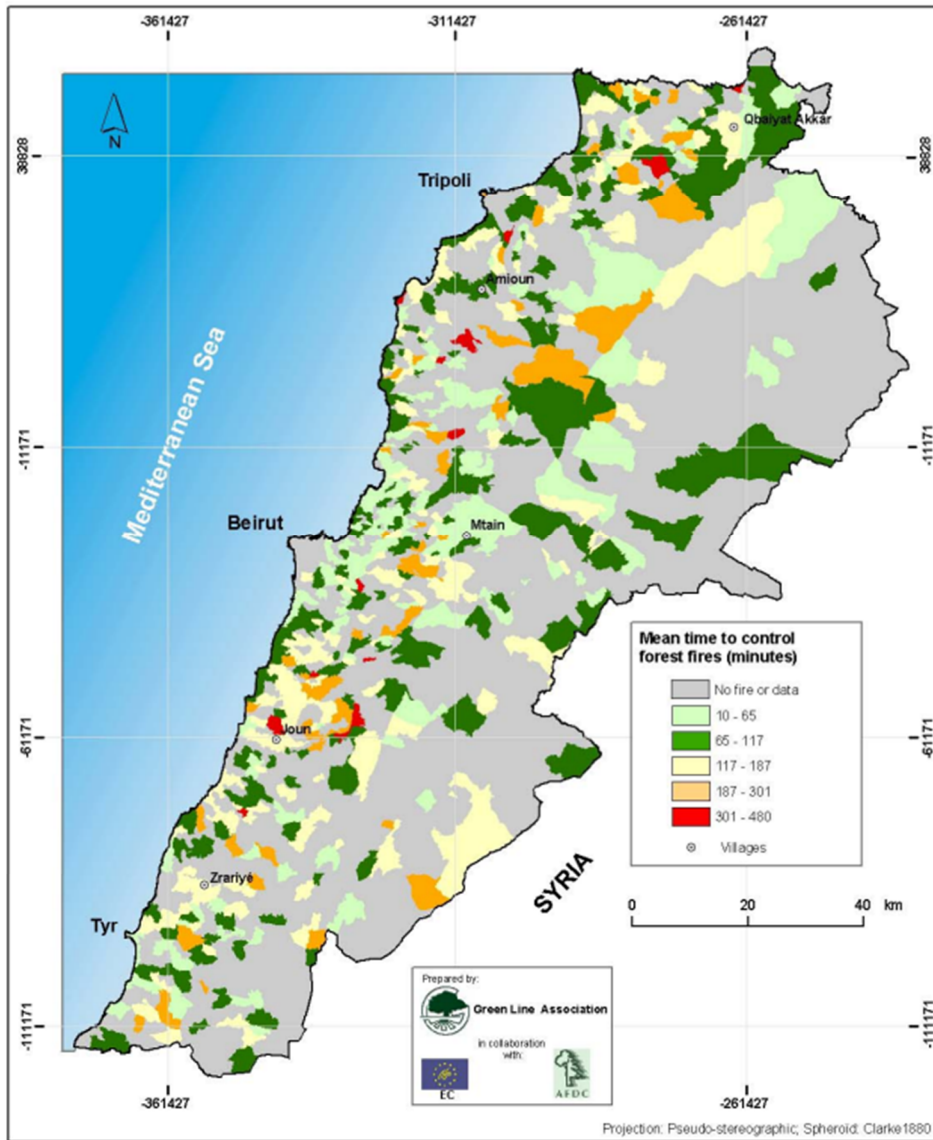


Figure 39. Land cover/use index fire map of Lebanon

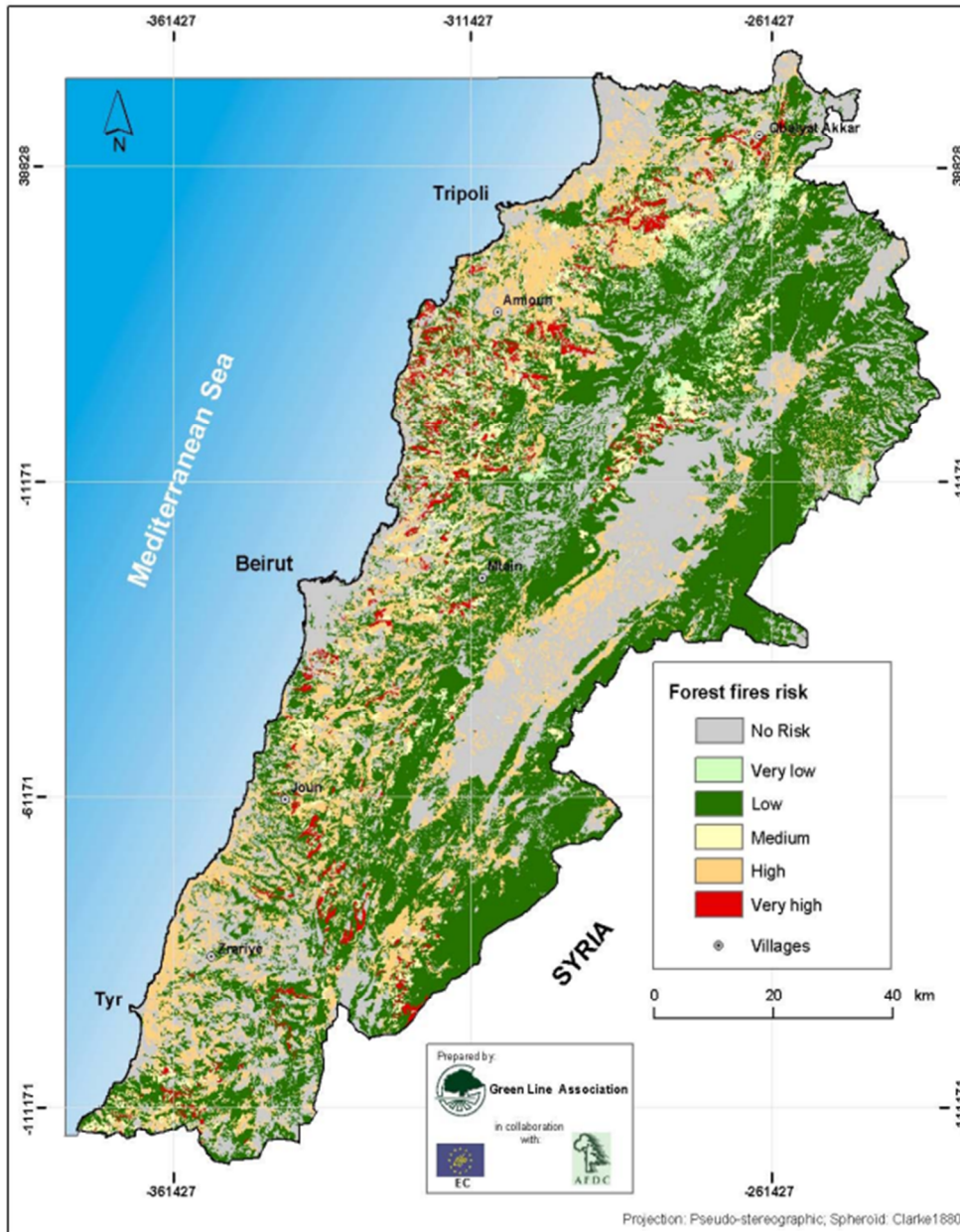


Figure 38. NDVI index fire map of Lebanon generated from Landsat TM satellite images

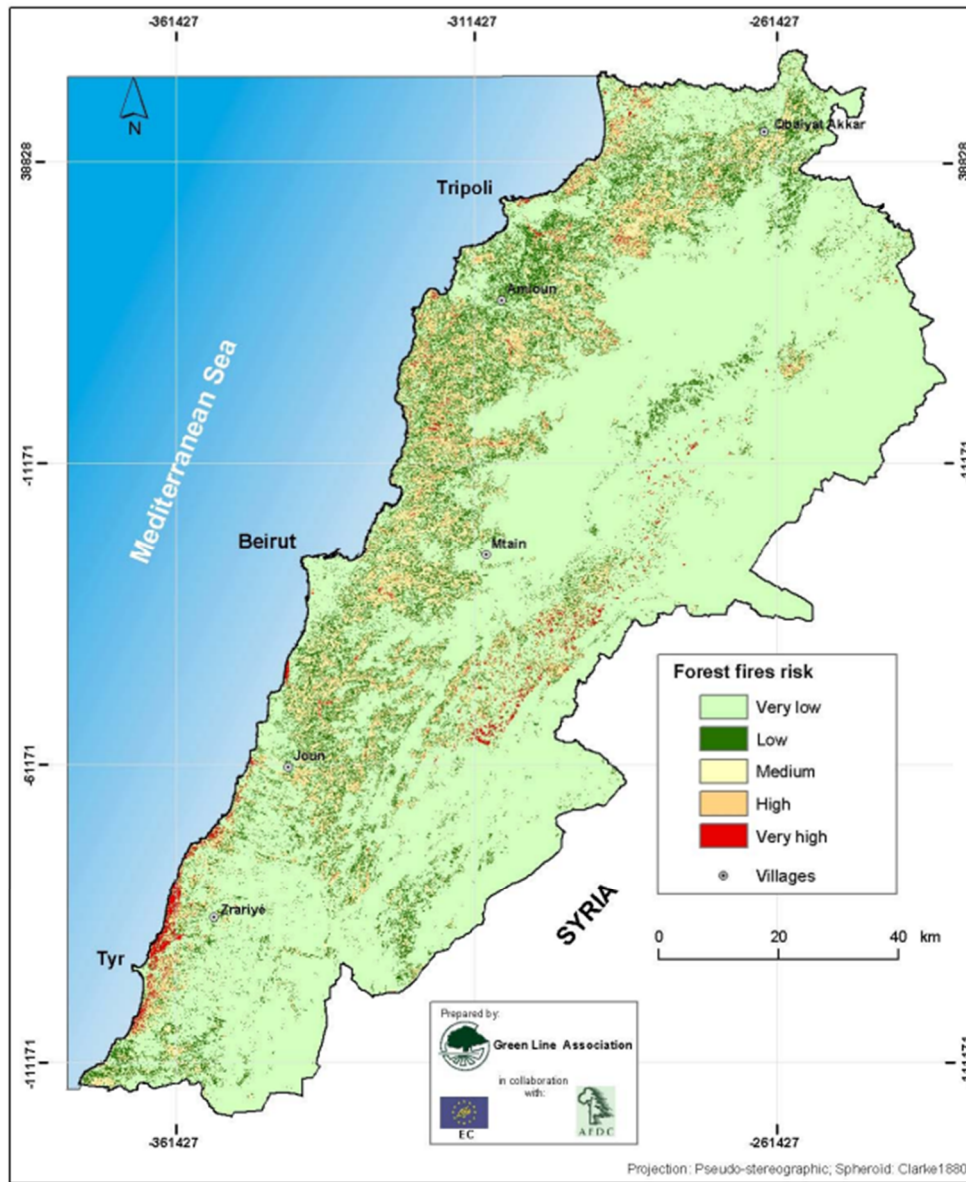


Figure 28. Forest fire occurrence map in accordance with cadastral zones distribution for 2003

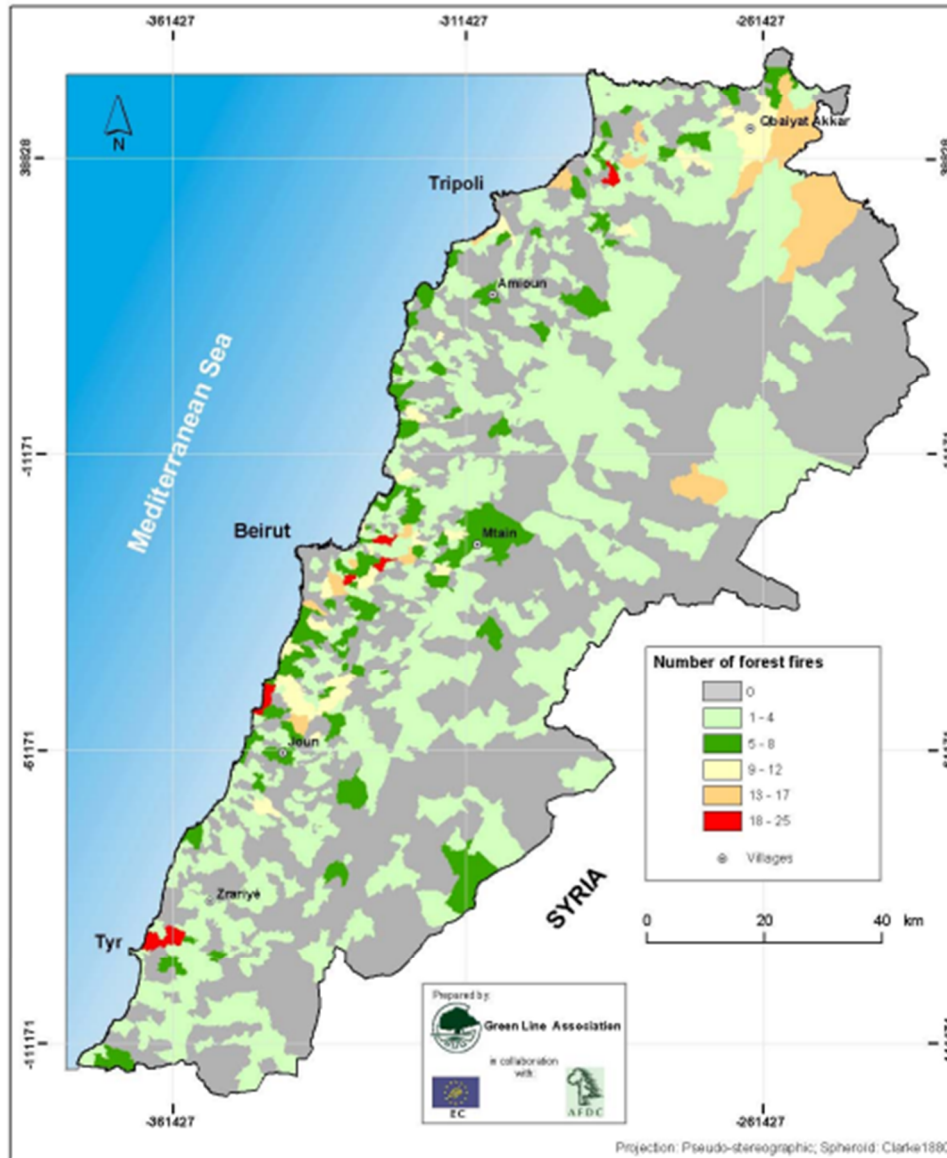


Figure 26. Forest fire occurrence map in accordance with cadastral zones distribution for the period extending between 1983 and 2001

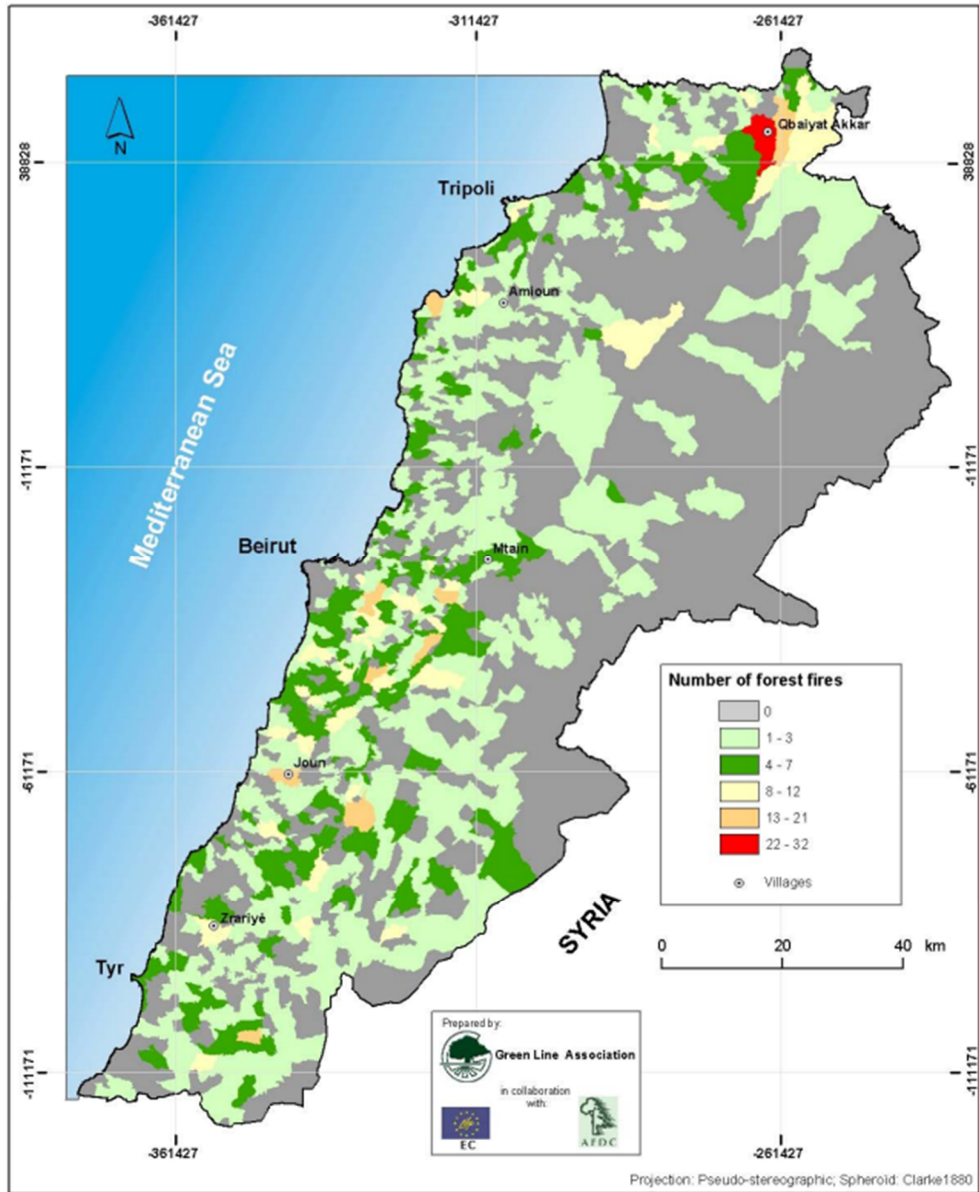
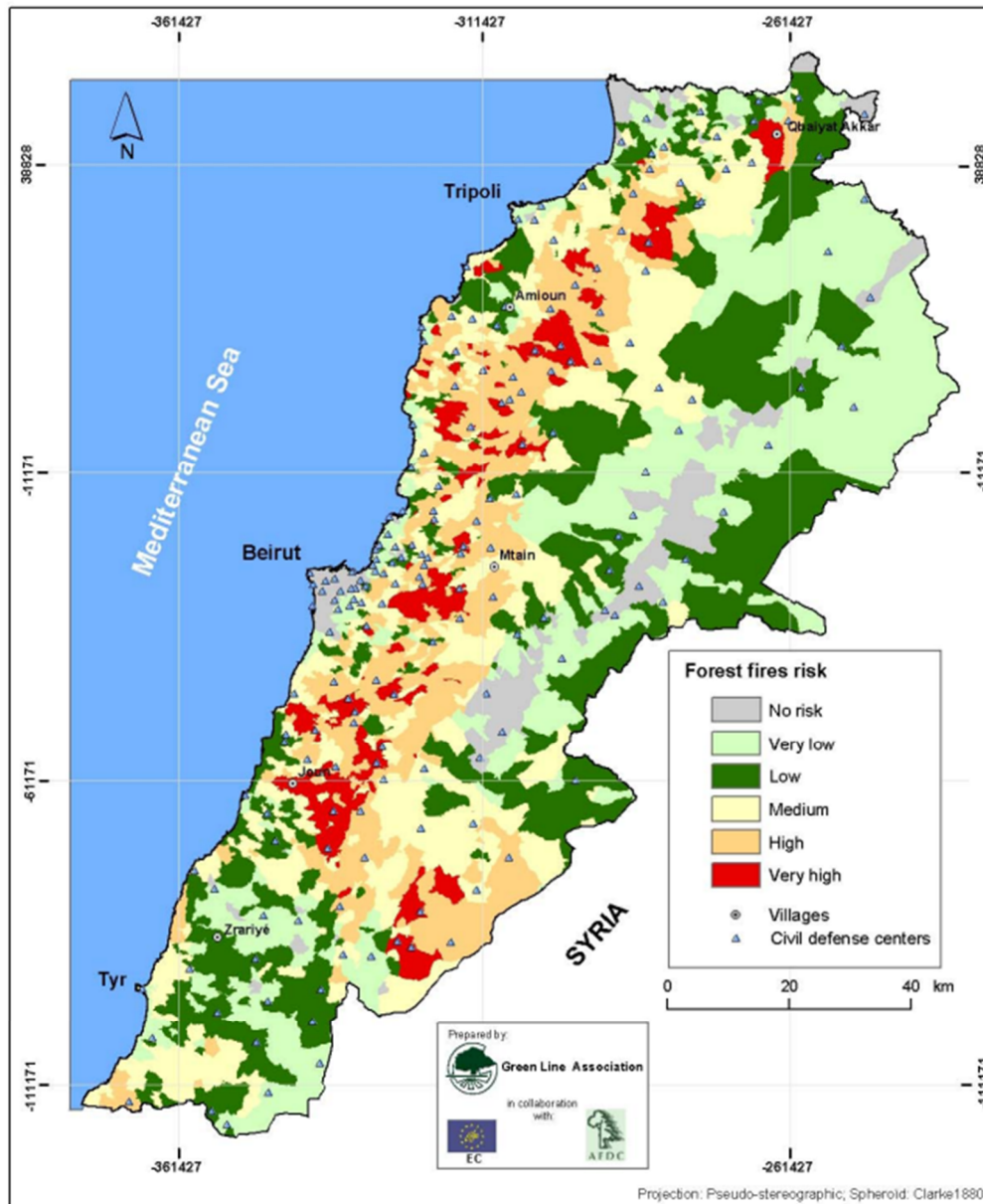


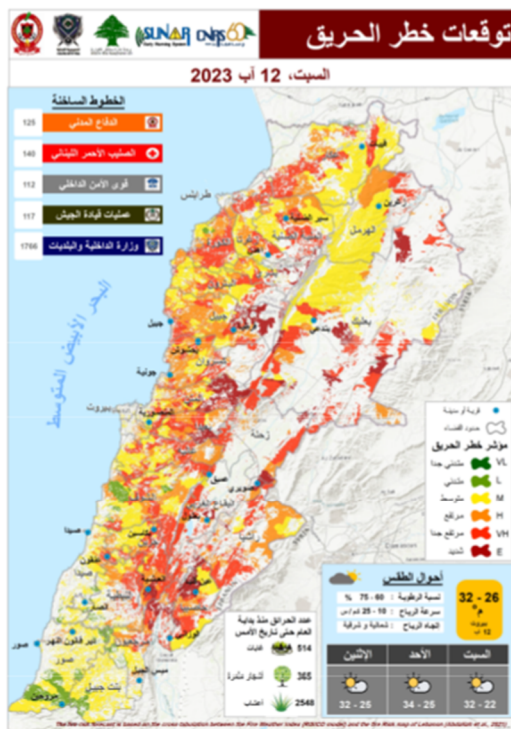
Figure 74. National fire risk map of Lebanon



Lebanon's forests: Dousing fire risks through stronger forest management

Summer of 2023 was marked by an early start to the wildfire season in Lebanon as intense forest fires ravaged several parts of the country, with fires erupting including in the Akkar and North governorates on a near-daily basis.

Government and community-based organizations responded quickly, joining forces to combat the flames, and often managing to limit the damage and avoid casualties despite the odds being stacked against them. “We do this with limited funds gathered from friends who share our love for this land,” says Khaled Taleb of the Akkar Trail Association, one of the community firefighting groups. “We have protected thousands of hectares using two locally equipped vehicles. With more support, we could avoid further tragedy and losses.”



Khaled is speaking about the need for equipment and human resources to fight fires as and when they flare up. However, these measures will only serve to combat the flames in the moment. **The reality is that fire is a long-term problem in Lebanon: every year, the country loses 1,500 ha of forested areas.** In order to sustainably manage its forests landscapes, Lebanon needs to take swift and decisive action to mitigate wildfire risks, which are amplified by climate change because higher temperatures dry out vegetation and create conditions conducive to the start and spread of wildfires. With July 4 being the hottest day on average on the planet since records began, it is clear that global climate change can no longer be regarded as tomorrow's concern. Lebanon needs to act now.

Lebanon's [139,000 ha of forests](#) provide a range of direct and indirect ecosystem services to local communities—and indeed the nation as a whole. Putting a figure to these services is a nuanced exercise, but World Bank research conducted as part of a technical assistance project funded by [PROGREEN](#) found that Lebanon loses an estimated [US\\$296 per hectare in total economic value](#) every time there is a forest fire. PROGREEN is a multi-donor trust fund administered by the World Bank.

Sustainable forest management has the potential to safeguard the substantial economic value locked in the country's forests by reducing the ever-present risk of wildfires. At the same time, sustainable forest management has the potential to unlock economic opportunities for Lebanon's most vulnerable communities. In a country like Lebanon where [13% of the land is covered in trees](#)—forests can represent a safety hazard or a potential source of sustainable livelihoods.

These findings and others are published in the recently released [“Lebanon Forest Note: Reducing Wildfire Risk through Sustainable Forest Management.”](#) The note sets out five concrete, actionable recommendations for creating inclusive economic opportunities while reducing the risk of wildfires:

- Improve governance and local capacity for sustainable forest management. This includes clarifying the roles and responsibilities of various ministries with respect to managing and coordinating fire risk management strategies; enabling communities to expand on their firefighting successes at a larger scale; and incentivizing private landowners to more sustainably manage the forests on their land.
- Improve access to data and information on forest fires, potentially by developing a shared Integrated Forest Fire Information Management System and running an outreach program to raise awareness about forest fires.
- Add value to wood products (for example, by turning wood into furniture) and non-wood products (such as pine nuts, honey, and carob), which would require a further feasibility analysis and, if the early indications are positive, strengthening the legal and regulatory framework for the sustainable harvesting and production of wood and non-wood products.
- Support sustainable nature-based tourism, a non-extractive industry that can be leveraged to raise fire-risk awareness and promote responsible behavior among tourists. Improved infrastructure for nature-based ecotourism would also be beneficial to firefighting organizations to access remote areas.
- Restore forest ecosystems to reduce fragmentation and related fire risks. Degraded forests and edge habitats of fragmented forests typically contain higher fuel loads, which increases the likelihood of these areas catching fire.

Some of the recommendations have already been integrated into development aid efforts, and there are signs that this work will be carried forward. Recently, the Global Environment Facility approved a US\$3.8 million grant for an upcoming project titled

“Community-based Wildfire Risk Management in Lebanon’s Vulnerable Landscapes”.

This project will use a community-based approach to support Lebanon on forest fire risk management.

The Developmental Role of Municipalities’ Unions in Northern Iqlim Al Kharroub

إقليم الخروب تغيب عنه الدولة والدور الاتماني لاتحاد بلدياته (الديار 28 أيلول)

الحجار : وضعنا برنامج عمل حول واقع ومُستقبل الاقليم للسنوات المقبلة

سبتمبر 28, 2022

إقليم الخروب منطقة تاريخية واجتماعية ثقافية تقع في الجزء الغربي من قضاء الشوف . تُعرّف أراضيها تقليدياً بأنها المنطقة الواقعة بين نهر الأولي في الجنوب ونهر الدامور في الشمال. وتمتد من ساحل البحر الأبيض المتوسط شرقاً حتى جبال الشوف. تبلغ مساحتها التقريبية 167 كيلومتراً مربعاً

في الإقليم اتحادان للبلديات اتحاد بلديات إقليم الخروب الجنوبي و اتحاد بلديات إقليم الخروب الشمالي

يتألف اتحاد بلديات إقليم الخروب الشمالي من 17 بلدية وهي: البرجين، الجية، الرميلة، المغيرية، الوردانية، برجا، بعاصير، جدرا، داريا، دلهون، سبلين، شحيم، عانوت، كترمايا مزبود، علمان البرغوتية، وضهر المغارة. ويقدر عدد سكان هذه القرى بحوالي: 160,000 نسمة وسيبلغ سنة 2025 ما يقارب 200,000 نسمة وتبلغ مساحة هذا الإتحاد العقارية حوالي 100 كلم مربع، وهو من الإتحادات الكبرى في لبنان

لتسليط الضوء على حاجات ومشاكل هذه المنطقة و اوضاع البلديات فيها كان للديار هذا الحديث مع رئيس اتحاد بلديات إقليم الخروب الشمالي المهندس زياد خليل الحجار

ما هي المشاكل التي يعاني منها إقليم الخروب وما هي اهم حاجات ومطالب المنطقة وهل هناك تقصير من الدولة ؟

يقول الحجار : إنطلاقاً من محاور التخطيط الأساسية كما وردت في قانون البلديات الصادر في 1977/6/30، ونظراً لتعاطي رئيس الإتحاد بالدراسات الهندسية والتخطيط، وضع رئيس الإتحاد برنامج عمل مع التساؤل حول كيف نريد الإقليم هل هو امتداد عمراني لبيروت وصيدا، أم أنه منطقة ذات توجه (vocation) أن يكون، وما هي رؤيتنا لمستقبل الإقليم، سياحي أو صناعي، أو هو موجه نحو منطقة جذب للإستثمارات، إن وضع هذه الرؤيا ومناقشتها مع الهيئات الإجتماعية والجمعيات والمنظمات الأهلية والمواطنين هي ضرورة لرسم صورة عن واقع الإقليم ومستقبله للسنوات القادمة

واوضح أن البرنامج يتضمن نظرة مستقبلية في كافة المجالات ومنها الإدارة وتنمية الموارد، الثقافة وإحياء تراث البلدات وتوثيق تاريخ المنطقة، وآليات المشاركة والتواصل مع الأهالي، بالإضافة إلى الخدمات العامة والبنى التحتية، والإهتمام بالنسيج العمراني والبيئة. وقد اهتم البرنامج بالسياحة (نظراً لوجود الكثير من المعالم السياحية والاثريّة) والترفيه والرياضة، وبالأخص بإمكانية عمل الإتحاد بالتنشيط الاقتصادي لخلق فرص عمل في المنطقة

ووفق الحجار في ظل غياب الدولة عن القيام بمسؤولياتها لسنوات طويلة في الإقليم، والتي ازدادت في السنوات الثلاث الماضية، تبقى المسؤولية الملقاة على عاتق اتحاد بلديات إقليم الخروب الشمالي كبيرة جداً، وتحتاج الى الكثير من الدراسات والميزانيات، لاحتواء اوضاع منطقة الإقليم من مختلف الجوانب الحياتية والانمائية، وسبل تفعيل ودعم عمل اتحاد بلديات الإقليم، لتحقيق التنمية المنشودة للمنطقة، بما يساعد على النهوض بها، ومعالجة المشكلات التي تعاني منها، والسعي لإطلاق مشاريع ومرافق تسهم في تنمية الإقليم اقتصادياً وخدماتياً، وتوفر فرص عمل وتعزز العمل المشترك والعيش الكريم لابنائهم.

وعن مشاكل الإقليم قال: يعاني إقليم الخروب كالعديد من المناطق من مشاكل عديدة، تتعلق بالمجالات التالية: المشاكل الحياتية اليومية للمواطن: من الإزدحام في الشوارع وحركة السير ومواقف السيارات والشاحنات والباصات، والطرق والساحات العامة وتخطيط الطرق الجديدة وتنفيذها، كما ما زال يعاني من مشاكل تصريف مياه الأمطار، والتلوث البيئي الناتج عن معمل الكهرباء في الجية وبعض المعامل الأخرى ومن شبكات الصرف الصحي بما في ذلك محطة التكرير في الجية، ومن مشاكل النفايات الصلبة

وشدد على ان المطلوب في الإقليم هو الكثير، ونستطيع القول المطلوب هو كل شيء وفي كافة المجالات، ومن البدء علينا الإشارة إلى أنه في هذا المجال، تتشابك الصلاحيات بين الإتحاد والبلديات والدولة بما في ذلك كافة الوزارات والمؤسسات العامة، بالإضافة إلى المؤسسات الأهلية، وصولاً إلى المواطن

وقال لدينا رؤية عن الواقع البلدي نسعى مع الزملاء في الإتحاد على وضع مخططات توجيهية لبلديات الإتحاد ومناطقه تمتد على عدة مجالس بلدية تعكس إحتياجات المنطقة وهي هائلة وسط الإهمال الذي عانى وما زال يعاني منه الإقليم

ما هي التحديات والمشاكل التي تعاني منها البلديات في الإقليم هل هناك مشاكل مالية سيما وان البلديات ما زالت تعتمد السعر الرسمي للدولار؟

يجيب الحجار في البدء هناك الصعوبات المتعلقة بالوضع المالي، فموازنة الإتحاد تأتي من البلديات انطلاقاً من قطع حساب هذه البلديات بالإضافة إلى حصة الإتحاد من الصندوق المستقل، ومع هذه الظروف الصعبة التي تمر بها البلديات فإن عائدات الإتحاد من البلديات انخفضت بشكل شبه نهائي مع مراعاتنا لأوضاع البلديات. بالإضافة إلى الروتين الإداري في البلديات وفي الجهات المعنية المسؤولة، كما أن حصة الإتحاد من الصندوق لم يتم دفعها منذ سنوات مما أثر على حجم الأشغال التي كنا ننفذها سابقاً

أما بالنسبة للبلديات فمشاكلها أكبر حيث أن الجباية انخفضت بشكل ملحوظ وهي أصلاً أصبحت متدنية حيث أنها تجبى على سعر الدولار الرسمي السابق، وباختصار فإن هذه التحديات تخف تلقائياً في حال اعتماد اللامركزية الإدارية الموسعة وفق الدستور. وقد أضيفت مؤخراً إلى مشاكل الإتحاد والبلديات مشكلة تطبيق قانون الشراء العام خاصة بالبلديات الصغرى.

اضاف إن الوضع الإقتصادي الذي يمر به الوطن وضع الإتحاد في موقع حرج، فتندرت الخدمات التي كان يتم تقديمها وتوقفت الأشغال كصيانة الطرقات وغيرها بسبب ارتفاع سعر صرف الدولار، كما توقفت المشاريع العامة الإتحادية بسبب ذلك.

ما هي المشاريع التي تقوم بها البلديات في هذه الظروف الصعبة؟

عمل الإتحاد لا يقتصر فقط على تنفيذ مشاريع مشتركة بين البلديات أو مشاريع لا تستطيع البلديات أن تنفذها بمفردها وفق قانون البلديات، بل يشمل كافة المجالات من الإدارة الحديثة والثقافة والإرشاد والبنى التحتية مع إتقانة إلى العمران والسيج العمراني والتربية والبيئة والرياضة والتنشيط الاقتصادي أي خلق فرص عمل لأبناء الإقليم.

وأشار إلى ان الإقليم أصبح وحدة سكنية متكاملة بعد اتصال غالبية القرى ببعضها البعض، وأصبح من الضروري وضع مخطط توجيهي للمنطقة كوحدة متكاملة. فالمخطط التوجيهي للمنطقة ككل يساعد في رؤية شاملة للإقليم ويصبح بالإمكان إنشاء مناطق صناعية بالمعنى الحديث للكلمة، ومحميات زراعية لزيادة المساحات الخضراء أو المحافظة على ما تبقى منها، بهدف المحافظة على البيئة.

لافتاً إلى إن فكرة المناطق الصناعية بالمعنى الحديث، مع تأمين البنى التحتية، من مياه شفة وصرف صحي ونظام كهرباء خاص بها، ومعمل معالجة النفايات، وغيرها من الخدمات كالإعتماد على الانارة بواسطة الطاقة الشمسية هي من أولوياتنا بالمشاركة مع القطاع الخاص، وهي تساعد على خلق فرص عمل للشباب، مؤكداً ان هذا الأمر ليس مستحيلاً، فهناك مصادر تمويل كثيرة، وكل المصانع الموجودة في المنطقة مستعدة للإنتقال إلى المناطق الصناعية في حال تنفيذ المخطط التوجيهي.

وقال : من هنا عملت منذ استلامي لرئاسة الإتحاد في تموز 2016 على وضع برنامج عمل هو انعكاس لخطة تنموية متكاملة سبق ان نشرتها في كتابي «التنمية المحلية في اقليم الخروب بين الواقع والامكانات» الذي تم عرضه في مؤتمر عقده في جامعة بيروت العربية في الدبية. إلا أن هذه الخطة تتطلب تحويل الإتحاد الى مؤسسة تنموية أو إلى ما أسميه «مجلس إنماء وتخطيط لإقليم الخروب» وهذا هدف نعمل جاهداً لتحقيقه من خلال بناء الشراكات مع الوزارات والمؤسسات العامة المعنية بالتنمية، والجامعات والمنظمات الدولية ومع كافة مكونات المجتمع وفي طليعتهم النخب والهيئات الاقتصادية ورجال الاعمال والقطاع الخاص، وهؤلاء هم الشركاء الحقيقيون لنا في عملية التنمية.

أما بالنسبة الى المطالب فهي كثيرة أختصرها بما يلي:

تسهيل الروتين الإداري –

تطبيق اللامركزية الإدارية الموسعة وفق الدستور مع العديد من التعديلات –

دفع مستحقات البلديات والإتحاد في أوقاتها ليتمكن الإتحاد والبلديات من وضع موازناتهم بشكل واقعي –

تعديل قانون الشراء العام بما يتلاءم مع أوضاع البلديات الإدارية والصغرى منها بالأخص، وبما لا يتناقض أيضاً مع –
قانون البلديات

وعن الوضع الحالي للإتحاد قال: لدينا أحلام كثيرة في الإتحاد: منذ البداية الإتحاد بتصوري هو الذي يضع رؤيا مستقبلية للإقليم، ويضع تصوراً كيف نريد للإقليم أن يكون بعد سنوات وما هو مستقبل الإقليم أي مستقبلنا

وختم بالقول : لا بد من الإشارة إلى أنه، وللأسف، كان تأثير الوضع الإقتصادي وارتفاع سعر صرف الدولار واستمرار انتشار وباء كورونا على الإتحاد بمشاريعه المستقبلية كبيراً فلم نستطع متابعة العمل لإبراز المعالم السياحية في الإقليم بعد أن تم تصوير أكثر من 60/ ساعة بواسطة «درون» للمعالم السياحية والطبيعية (مؤتمر كان مقرراً مع جامعة بيروت العربية الدبية) كما توقف مشروع المخطط التوجيهي لإقليم الخروب وتم الإتفاق المبدئي مع جامعة بيروت العربية الدبية وتواصلنا مع الجامعة اللبنانية لتنفيذه، كما توقف مشروع وضع خطة «لفرص وإمكانيات الإستثمار في إقليم الخروب (مع مؤسسة إيدال)، كما توقفت مشاريع دراسات الطرق والطرق الدائرية للبلدات الكبرى والعديد من المشاريع في مجالات البنى التحتية والحدائق العامة وغيرها الكثير.

The Role of the Lebanese Civil Defense: An Overburdened Department

Directorate General of the Lebanese Civil Defense

The **Lebanese Civil Defense** or **General Directorate of the Lebanese Civil Defense** is a public emergency medical service of Lebanon that carries out patient transportation, search and rescue activities and **fire-fighting** response.^{[1][2]}

It is funded and administered by the Ministry of Interior and Municipalities (Lebanon). The directorate works in conjunction with the Lebanese Red Cross along with other pre-hospital service organizations in the country.^{[1][3]} The current Director General of the Lebanese Civil Defense is General Raymond Khattar.^[4]

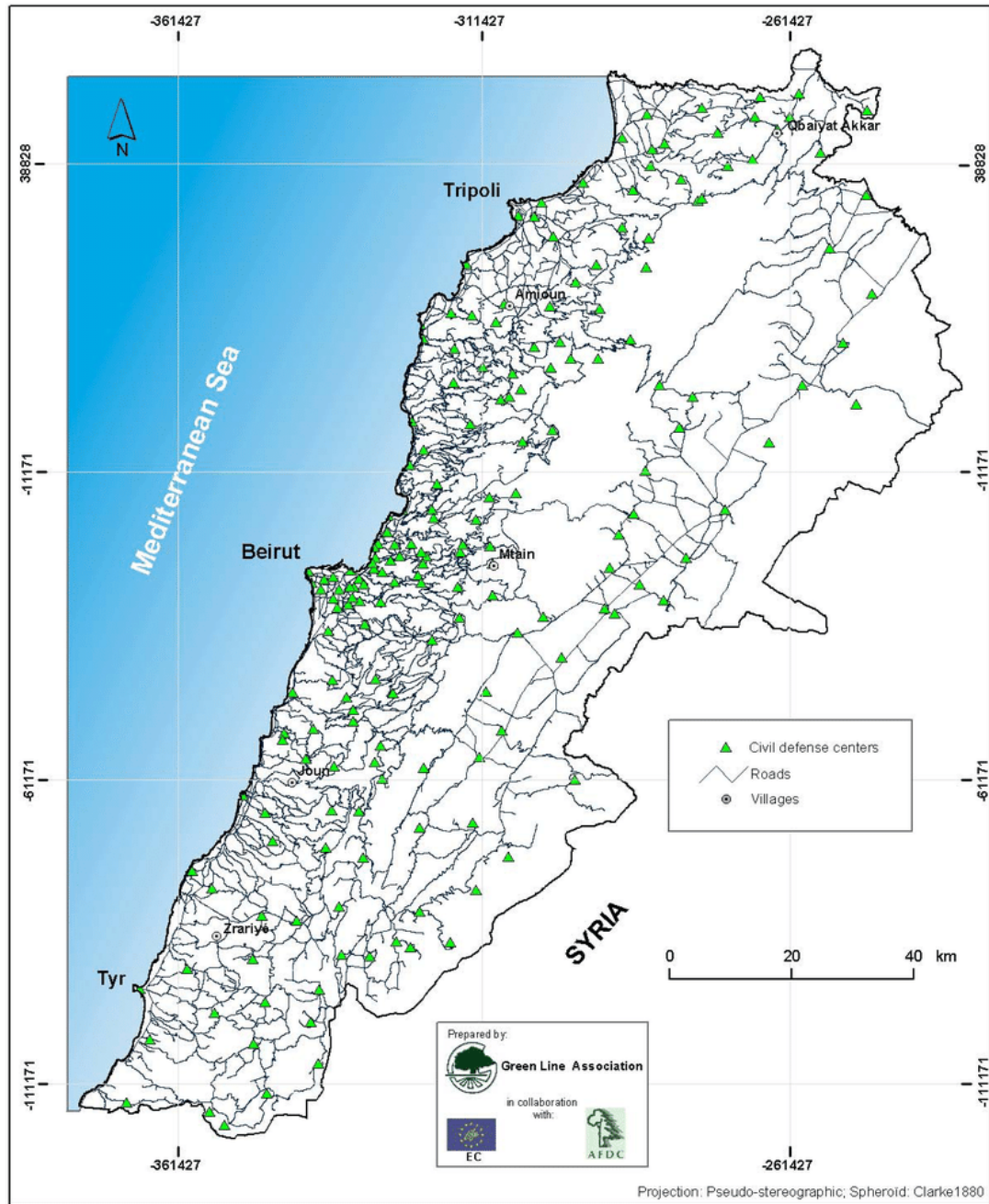
The Civil Defense was established in 1945 and in 1994 it became a General Directorate. Its members undertake the following tasks: firefighting, first aid, awareness and guidance.

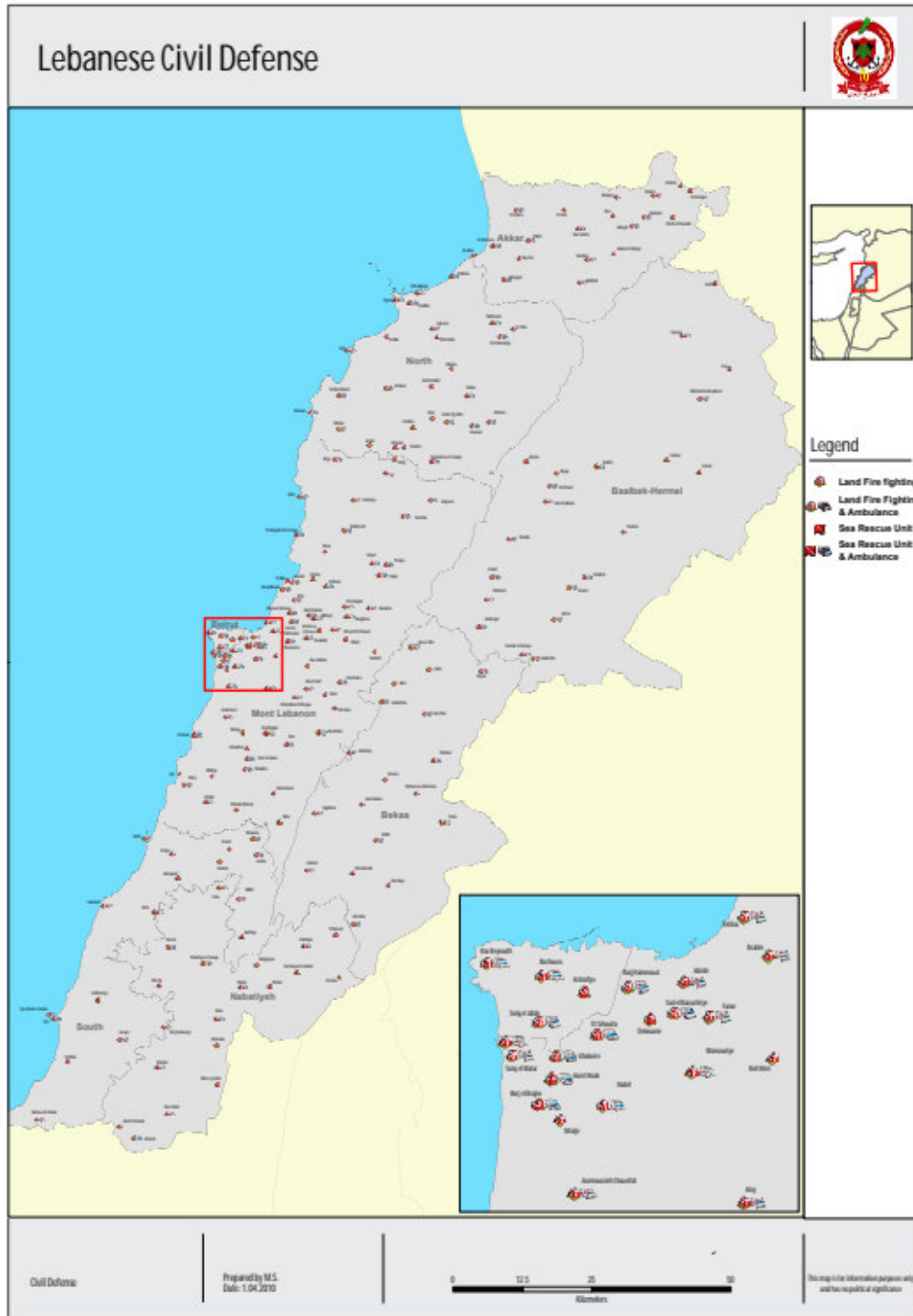
In 2001, the regional maritime rescue unit was established in the main center of Jounieh Port and it includes five units distributed from north to south, providing services related to rescue, first aid and maritime fire-fighting, in addition to raising awareness among school students, clubs and associations on the dangers of the sea, rivers and irrigation ponds. Thirty-eight martyrs were killed while performing their duties since the establishment of the Civil Defense until the present day.

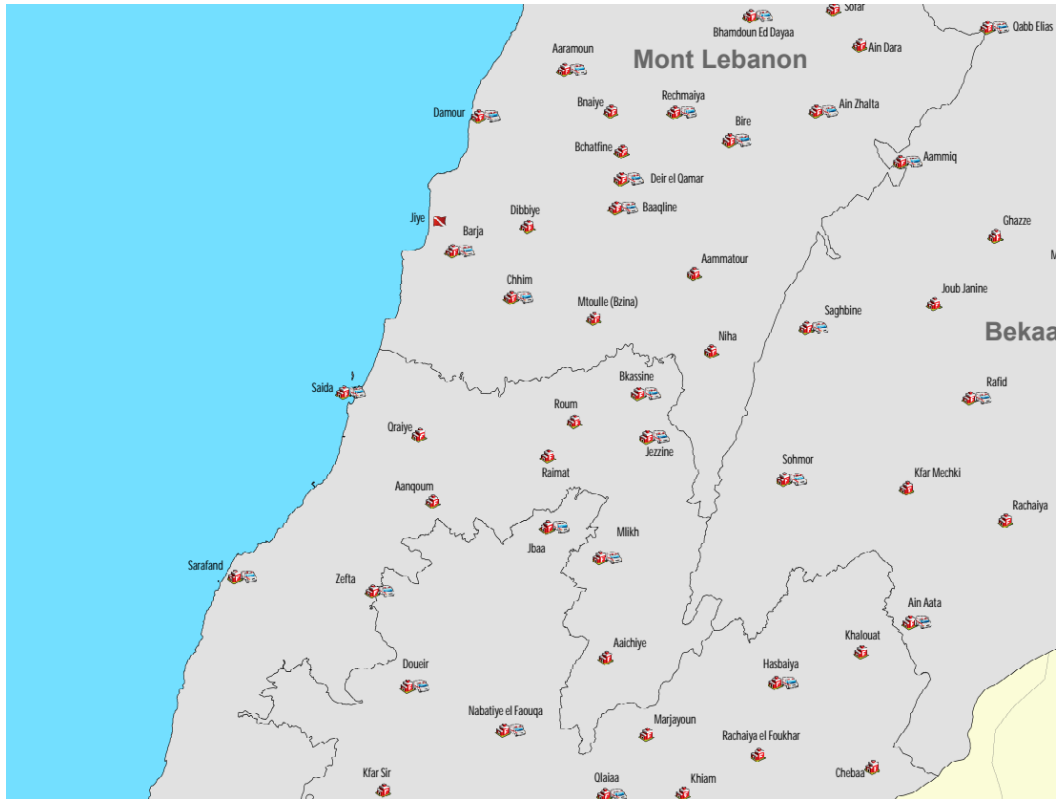
Scope of Responsibilities:

تغطي مهام الدفاع المدني الأراضي اللبنانية كافة، ويمكن تحديدها على الشكل الآتي

- تأمين الحماية المدنية للأشخاص والممتلكات والبيئة وتدارك الخسائر فيها
- تجنب الأخطار التي تهدد السلامة العامة ومواجهتها والحد من نتائجها، وذلك في حالات الكوارث والنكبات الطبيعية والظروف الطارئة الناجمة عن الأعمال الحربية، وفي حالة خطر الحرب بمختلف أشكالها. وله في سبيل تأمين ذلك، الحق في تأهيل الأفراد لممارسة الحماية الذاتية، ولضمان استمرار الحياة العامة بصورة طبيعية في الحالات المشار إليها عن طريق:
 - تكليف الأهلين بالموجبات التي تستدعيها مقتضيات الدفاع المدني
 - إعلام المواطنين وتوجيههم وإرشادهم وتدريبهم على أعمال الدفاع المدني، وإخضاعهم للتمارين الدورية اللازمة.
 - إجلاء السكان وإيواءهم وتوفير سبل معيشتهم بالتنسيق مع الإدارات والمؤسسات المختصة، وإخلاء الأماكن الخطرة والمعرضة للخطر.
 - هدم الأبنية المعرضة للانهدام.
 - تأهيل الأشخاص لتأدية المهام المطلوبة
 - السهر على تطبيق القوانين والأنظمة النافذة المتعلقة بكل أعمال الدفاع المدني
 - تنفيذ القرارات الرسمية وفقاً للأحكام القانونية والتنظيمية النافذة







Civil Defense: Limitations of Firefighting Resources and Capabilities

Establishment of The Civil Defense Higher Committee

The Civil Defense Higher Committee was established in 1939 under the French Mandate of Lebanon. It was headed by the Minister of the Interior and consisted of many members including a representative of the French Higher Commissioner, a representative of the Commander in Chief, the director and advisor of the Ministry of Finance, the director and advisor of the economic departments and the Chief of Police. On May 5, 1956, a law stipulating the formation of an authority tasked with handling civil defense in times of war and peace was issued. The authority was to fall under the Ministry of National Defense- Army Command.

Article 12 of the Legislative Decree No. 159 issued in 1959 stipulated the formation of the Directorate General of Civil Defense under the control of the highest military command.

The Directorate consisted of:

- A central directorate
- A head of department in each Mohafazah
- Civil defense schools
- Departments for equipment and shelter management

Civil Defense was re-organized by virtue of the Legislative Decree dated August 5, 1967 and became affiliated to the Ministry of Interior and Municipalities.

Functions

According to legal texts, the Lebanese Civil Defense is an essential constituent of national defense. It is responsible for:

- Creating plans and civil defense procedures aimed at redressing or preventing loss of life and property in times of war and natural disasters.
- Emergency evacuation from dangerous places or those under threat.
- Sheltering evacuees.

Structure

A Grade 1 Director General runs the Lebanese Civil Defense. Should his post become vacant the Director General may be replaced by an officer from the Lebanese Army or the Internal Security Forces holding one of the following three ranks: Major, Lieutenant Colonel or Colonel.

The Directorate General of Civil Defense consists of:

- A Central directorate including four units:
 - *An Administrative Unit*
 - *A Technical Unit*
 - *A Technology Unit*
 - *A Transport and Operations Unit*
- Civil Defense centers distributed across Lebanon. The sites of such centers are determined pursuant to a decision issued by the Minister of the Interior and Municipalities. Each center is headed by a Grade 3 employee or an officer from the Lebanese Army or the Internal Security Forces holding at least the rank of Lieutenant.

The Civil Defense personnel comprises some 1,806 employees working with approximately 2,200 volunteers and is accounted for as follows:

Civil Defense Personnel				
Unit	Grade 3	Grade 4	Grade 5	Total posts
Directorate General	-	7	4	11 (in addition to the Grade 1 Director General)
Administrative Unit	3	14	4	21
Technical Unit	5	17	4	26
Technology Unit	1	10	4	15
Transport and Operation Unit	3	22	7	32
100 Civil Defense Centers	100	1400	200	1700
Total	112	1470	223	1806

Source: Lebanese Civil Defense official website

Budget

Civil Defense is allocated an annual budget embedded within the budget of the Ministry of the Interior and Municipalities. It is also entitled to 5% of the municipalities' share from the Independent Municipal Fund. In the 2012 draft budget law, the Lebanese Civil Defense was assigned LBP 10 billion. Its share of the Independent Municipal Fund in 2011 stood at LBP 18.348 billion, which brings its total budget to LBP 28.348 billion.

Providing the Lebanese Civil Defense with the modern equipment and machinery necessary to improve its performance is an inevitable step if we are to promote the role of this body, in addition to expanding its manpower or at least filling the growing number of vacancies instead of relying on volunteers.

Recap and Closing Remarks

In 2019, Lebanon faced devastating forest fires that had a significant impact on the Chouf region and other areas. Here are the key details:

1. Lebanon Wildfires 2019:

- **Extent:** A series of **194 forest fires** spread over large areas of Lebanon's forests, affecting both forested regions and residential areas.
- **Affected Areas:**
 - **Chouf:** The Chouf district in Mount Lebanon was severely affected.
- **Impact on Residents:**
 - **Evacuations:** Residents were directed to evacuate their homes due to the risk of suffocation and threats to their lives.
 - **Casualties:** At least one civilian reportedly died in the Chouf area while volunteering to help firefighters extinguish a fire.

2. Possible Causes:

- **High Temperatures:** The fires were exacerbated by high temperatures, reaching 38 degrees Celsius, and dry winds that helped spread the flames in forests and green areas.
- 3. **Firefighting Efforts and International Response:**
 - **Lebanese Civil Defense:** The Lebanese civil defense and army planes made significant efforts to combat the fires, but resource limitations hindered their work.
 - **Displaced Volunteers:** Displaced Palestinians and Syrians also participated in extinguishing fires.
 - **International Assistance:**
 - **Cyprus:** Cyprus sent two planes to assist in firefighting operations.
 - **Jordan:** Two planes arrived from Jordan to participate in extinguishing fires.
 - **Turkey:** Turkey also sent planes to help put out the fires.
 - **Greece:** Greece contributed firefighting planes as well¹.

The 2019 Lebanon wildfires serve as a stark reminder of the importance of fire safety measures, adequate resources, and international cooperation in mitigating such disasters.

What are the general consequences of inadequate Resources and fire stations?

Inadequate fire stations can have significant consequences for public safety:

In summary, inadequate fire stations can lead to loss of life, property damage, legal consequences, and disruptions to communities. It is crucial for Lebanon to prioritize fire safety measures and invest in well-equipped fire stations to protect lives and property, and Lebanon's forests.

What additional measures can prevent future wildfires in Lebanon?

Preventing future wildfires in Lebanon requires a combination of proactive measures, community engagement, and sustainable forest management. Here are some key strategies:

1. National Emergency Plan for Forest Fire Prevention:

- In 2022, the Ministry of Environment launched the **National Emergency Plan** to improve forest fire management in Lebanon and minimize negative ecological, social, and economic impacts of wild/forest fires¹.
- The plan aims to coordinate national and local efforts, enhance readiness, reduce fire risk, and create awareness about fire risks.
- Key components include:
 - **Early Warning Systems:** Developing systems to monitor fire probability and detect fire events promptly.
 - **Ecological Resilience:** Increasing ecological and social resilience to fire by preventing harmful fires and unsustainable firefighting practices.
 - **Awareness:** Raising awareness among land users to rapidly detect and communicate fires at an early stage¹.

2. Fire Lab Platform and Fire Patrol App:

- The **Fire Lab platform** forecasts wildfire risk, highlighting vulnerable areas, while the **Fire Patrol mobile application** allows users to report fire incidents and receive danger alerts².
- These technological tools enhance preparedness and facilitate rapid response.

3. Sustainable Forest Management:

- **Climate Change Considerations:** Climate change amplifies wildfire risks due to higher temperatures and drier vegetation.
- **Swift Action:** Lebanon must take decisive action to mitigate wildfire risks.
- **Recommendations from the Lebanon Forest Note:**
 - **Risk Reduction:** Develop fire prevention measures and early warning systems.
 - **Pest and Disease Management:** Manage outbreaks to protect forests and resources.
 - **Inclusive Economic Opportunities:** Create economic opportunities while reducing wildfire risk³.

By implementing these measures, Lebanon can safeguard its forests, protect communities, and mitigate the impact of wildfires.

Safeguarding Lebanon's forests through fire prevention

Lebanon celebrates success in forest fire prevention with a 90% reduction in two years, but the country faces a new threat: deliberate fires burning southern regions.

A few years back, the Intergovernmental Panel on Climate Change (IPCC) warned that the risk of wildfires in the Mediterranean is expected to worsen due to longer heat waves and extreme drought episodes. In Lebanon, warmer and drier summers are already translating into longer fire seasons, with more frequent, intense, larger, and catastrophic wildfires. In fact, in summer 2023, the country witnessed unprecedented near-daily wildfires.

For the third consecutive year, the Lebanese Ministry of Environment and its partners launched the national campaign for forest fire prevention. This step comes in celebration of World Environment Day and as part of the country's strategy for forest fire prevention. This annual campaign aims to raise awareness about the importance of preventing forest fires through land management practices, responsible recreational activities, community preparedness, early detection, and coordination. The strategic vision of the ministry with the unmatched efforts of experts and volunteers have succeeded in significantly reducing forest fires by up to 90% in the past 2 years.

However, massive forested areas are being deliberately set on fire and scorched in southern Lebanon today. This environmental massacre has been ongoing since October 2023, as Israel continues to use white phosphorus munition and other immoral incendiary weapons to render the land uninhabitable, depriving the locals of basic ecosystem goods and services.

It is important to note that Lebanon's civil defense still suffers from shortages in equipment, personnel and funding. Firefighters are mostly volunteers who do not receive any remuneration for the life-saving services that they offer. As such, the absence of dedicated funds for addressing fire risks has been hampering collective action. This challenge led the ministry of environment to develop a framework for a National Forest Fire Emergency Fund (NFFEF). The objective of the NFFEF is to provide financial support to efficiently manage and combat wildfires in Lebanon.

Other efforts aiming to prevent and efficiently respond to forest fires in Lebanon include the [Fire Lab](#) platform that forecasts wildfire risk, highlighting the most vulnerable areas and the [Fire Patrol](#) mobile application allowing users to report fire incidents and receive fire danger alerts, among many others. Similarly, The World Bank is currently preparing a 3.5 million USD project to prevent forest fires and establish a fund to support local communities and forest responders in better managing their forests.

Such concerted efforts are essential to maintain the environmental, cultural and socioeconomic benefits of Lebanon's forests. These initiatives offer a glimpse of hope amid uncertain situations to safeguard the country's richest asset from long-term deterioration.

Towards COP27:

Arab Regional Forum on Climate Initiatives to Finance Climate Action and the SDGs Project Fact Sheet National Emergency Plan for Forest Fire Prevention, Awareness and Readiness LEBANON

Climate finance purpose

- Adaptation

Sector

- Agriculture

Geographic coverage

Sub-national

- Zone 1: Akkar-Hermel-Baalback, Zone 2: Minyeh-Dinniye, Zone 3: Koura, Zgharta-Bsharreh-Tripoli, Zone 4: Batroun, Zone 5: Jbeil-Kesrouan, Zone 6: Metn-Baabda, Zone 7: Aley-Shouf, Zone 8: Saida-Jezzine, Zone 9: West Bekaa-Zahleh-Rachaya-Hasbaya, Zone 10: Nabatiyeh-Marjeoun, Zone 11: Sour-Bint Jbeil

Description

In June and July 2022, heatwaves struck Europe and North Africa as temperatures climbed above 40 degrees Celsius and broke many long-standing records in some places. Heatwaves have become more frequent around the Mediterranean and Lebanon experienced catastrophic fires in 2019. In July 2021, un-precedent fires occurred in the Akkar region burning more than 1,500 Ha only in few hours. Also, heatwaves fuelled fires in high mountain lands affecting cedar, juniper and fire forests.

The Lebanese Government through the Ministry of Environment has started since 2021 an extensive campaign to increase preparedness against fires. In 2022, the Ministry of Environment launched the National Emergency

Plan for fire prevention, awareness and readiness to improve forest fire management in Lebanon and therefore minimize the negative ecological, social, and economic impacts of wild/forest fires. The purpose of this plan is to coordinate national and local efforts in readiness to address wildfires, reduce fire risk and create awareness about fire risks.

The aim of this project is to implement the National Emergency Plan in the 11 priority zones that were identified as most vulnerable to forest fires and climate change.

The implementation of the national emergency plan for fire prevention, awareness and readiness is in line with the NDC adaptation guiding principles (Substantially reduce the risk of climate and non-climate related disasters to protect lives, the economy and physical and natural assets) and falls under the following adaptation priorities presented by Lebanon's NDC 2021:

Adaptation priority 2. Promote the sustainable use of natural resources, restore degraded landscapes, and increase Lebanon's forest cover while meeting the ecological, social and economic needs of sustainable forest management

Adaptation priority 7. Reduce disaster risk and minimize damages by mitigating and adapting to climate related natural hazards and extreme weather

Beneficiaries

Municipalities in areas of high risk, Unions of municipalities in high-risk areas and local NGOs

Climate rationale

The Lebanese forestry sector is vulnerable and threatened by many problems: forest fragmentation, quarries, grazing practices, overexploitation of forests, poorly enforced legislation, and pests and disease. Yet, the biggest threat to the forestry sector in the past few years has been climate change, especially since the main causes of forest degradation according to the National Council of Scientific Research are forest fires, land erosions, storms, and heavy wind, with forest fires causing the highest cost of damages on Lebanese forests.

Terrestrial biodiversity is also highly threatened by climate change. Drier climate and increased human pressure are expected to cause significant impacts on terrestrial biodiversity, forest productivity, burnt area, freshwater ecosystems, and agro-systems.

Expected outcomes

- Improve interventions and safety in monitoring the probability of fire and detecting the event of fire
- Increase ecological and social resilience to fire, and preventing the occurrence of harmful fires and unsustainable fire-fighting regimes are undertaken

- Raise awareness and know-how of land users to help in rapidly detecting and communicating fires at a very early stage

Outcomes contribute to SDG 1, 8, 12, 13 and 15.

The proposed activities are in line with Lebanon's updated NDC (2021), and in line with the activities presented under adaptation priority 2:

- Adapt forest systems to climate change by halting land degradation, controlling erosion of topsoil, improving water quality and soil productivity;
- Establish sites with improved production capacity linking with the development of wood and non-wood forest product processing industry and with the people's needs in terms of goods and services and improved employment opportunities;
- Promote sustainable rangeland management;
- Reduce the risk of intense and frequent forest fires through the development of fire prevention measures and early warning systems;
- Manage pest and disease outbreaks to protect forests and forest resources.

Project implementation period

- 24 months

Total Project Cost

- Amount in National Currency:
- Amount in US\$ equivalent (per 1 August 2022 exchange rate): 1,500,000 USD

Financing requirement

- Amount in National Currency:
- Amount in US\$ equivalent (per 1 August 2022 exchange rate): 1,500,000 USD

Expected Tenor / Duration of financing: 48 months

Project Status: Pre-feasibility

Contractual Structure: Government ownership

Project proponents Ministry of Environment

Project Information Document (PID); Concept Stage | Date Prepared/Updated: 16-May-2023; ON A PROPOSED GRANT FROM THE GLOBAL ENVIRONMENT

FACILITY TRUST FUND IN THE AMOUNT OF US\$ 3,786,510 TO THE REPUBLIC OF LEBANON

The World Bank: Community-based Wildfire Risk Management in Lebanon's Vulnerable Landscapes

Status of Lebanon's Forest and Woodland Resources

- 1. According to data from the 2015 Global Forest Resources Assessment (FAO, 2016), forests cover 13.2% of Lebanon's land area and "Other Wooded Lands" (OWL) cover 10.2%.** Other lands with trees, including fruit trees, olive yards, highly degraded forest lands that do not fall under "Forests" or "OWL" cover 11% of the total land area. The forest area in Lebanon, is divided into three sub-classes: Coniferous (incl. Pine, Juniper, Cedar, Cypresses, and Fir) (32%), Broadleaved (incl. Oak and Ostrya) (57%) and Mixed Forest (11%) (UNDP, 2021). Lebanon is currently finalizing the updated FRA.
- 2. Lebanon is part of the Mediterranean Biodiversity Hotspot (CEPF, 2010).** The Mediterranean Basin biodiversity hotspot is the second largest hotspot in the world and the largest of the world's five Mediterranean-climate regions. It is the third richest hotspot in the world in terms of its plant diversity (Mittermeier et al. 2004). Approximately 30,000 plant species occur, and more than 13,000 species are found nowhere else, or endemic, to the hotspot; yet many more are being discovered every year (Plantlife International 2010, unpublished report). Lebanon has some 494 known species of amphibians, birds, mammals, and reptiles according to figures from the World Conservation Monitoring Centre. Of these, 0.6% are endemic, meaning they exist in no other country, and 3.2% are threatened. Lebanon is home to at least 3000 species of vascular plants. 0.3% of Lebanon is protected under IUCN categories I-V.
- 3. Lebanon's forests hold 2 million metric tons of carbon in living forest biomass. Between 2000 and 2018, Lebanon permanently lost an average of 158 ha of its forest cover per year.** Lebanon has not yet comprehensively assessed the drivers of deforestation and forest degradation, however, observed threats to forests include urban sprawl, agriculture activities, quarrying, and recreational activities. Over the past years, wildfires have played an increasing role in the destruction of Lebanon's forest ecosystems and woodland resources – the increase in size and strengths of wildfires is linked to the impacts of climate change (Mitri and Gebrael, 2022).

4. **The forest ownership in Lebanon is almost equally distributed between the private sector and the public sector, with smaller areas associated with religious communities, under several tenure systems Waqf, Macha¹a, Amiri and Mulk. Agricultural and residential lands are privately owned.** Rangeland is owned by the government, with use rights granted to local communities. Land tenure problems are a key factor in land degradation in Lebanon. Registration and transaction costs are enormous. Roles and responsibilities for managing the common lands are not clear leading to their over-exploitation for grazing, quarrying and agriculture. Land fragmentation due to inheritance laws paralyzes efficient land use. Absence of land use planning leads to prime agricultural land being lost to urban development while enormous costs are being put for land reclamation nearby. A comprehensive solution for land issues promoting security of access including resolving land disputes, removing barriers for efficient transactions, consolidation of fragmented land and proper land use planning need to be elaborated as an essential ingredient in the strategy for combating land degradation (FAO, 2012¹).

5. **The project will place a total area of 12,638 ha under improved sustainable forest landscape management practices and restore 10,000 ha of forests in degraded lands with focus on creating bio-corridors to link forest fragments.** The targeted landscapes (Akkar, Minieh-Dinniyeh, Aley-Shouf – incl. areas from Metn-Baabda) are categorized by the MoE as “fire hotspot” areas based on the use of the most updated fire risk mapping (i.e., distributed within a total of 11 administrative units across the country). This landscape makes part of the total size forests and other wooded land of 22,086 ha which are assessed with a risk for forest fires and very high exposure to land degradation as characterized by the LDN assessment. These areas are important not only from an environmental point of view but also contribute significantly to peoples’ livelihoods and economic activities.

6. The PDO will be measured by the following set of indicators:
- Forest area brought under improved management plans based on SFM principles (ha)
 - Unmanaged forest area under annual high fire risk and burnt (ha/year)
 - People in targeted forest and adjacent communities with increased monetary or non-monetary benefits from forests (#, disaggregated by gender)
 - Net GHG emissions (tons CO_{2e})

¹ Country Study on Status of Land Tenure, Planning and Management in Oriental Near East Countries. FAO, 2012.

- Share of project beneficiaries who report being satisfied with project interventions (livelihoods, forest management, other) (percent, disaggregated by gender and ethnicity)
- Forest area with enhanced biodiversity protection (ha)

7. The main project beneficiaries will be (i) at the national level: the Ministry of Environment, the Ministry of Agriculture, and the DRM Unit in the Prime Minister's Office, (ii) at the sub-national level: associations of municipalities, municipalities, local communities in the targeted fire hotspots; and (iii) non-governmental organizations and private sector entities working in the selected fire hotspots.

D. Concept Description

8. **The project will support the efforts of the Government of Lebanon to manage (i) forest fire risks and actual occurrences in a timelier and effective manner; and (i) integrating forest fire risk considerations into the sustainable management of forest landscapes.** This will be achieved by supporting policy changes, cross-sectoral collaboration at national and sub-national levels, gender-responsive capacity enhancement and knowledge sharing using and improving existing networks, including first responder networks, community-driven action groups, and social networks; and investments for forest landscape restoration as well as gender responsive evaluation and adaptive learning. The Theory-of-Change (ToC) can be found in Annex 2.

9. The project will also support the GoL with enhancing the capacity for and the implementation of the NFFES for Lebanon, the emerging National Forest Fire Emergency Fund (NFFEF) (an innovative funding mechanism that would be mobilized in high fire risk situations or responding to actual events) and the NFP. The project would therefore contribute to Lebanon's commitments to the UNFCCC, UNCBD and UNFCCC.

10. The proposed project would have two interlinked yet distinct technical components². The project would be designed to increase the forest area under sustainable community-based management while enhancing the responsiveness of forest guards and early responders to wildfire risks and actual fire occurrences; wildfires being one of forest land degradation. At the same time, the project would improve the enabling environment for supporting wildfire risk management investments, by addressing solutions to regulatory constraints and by providing

² A third component would be dedicated to monitoring, evaluation and knowledge management; and a fourth one to project management.

gender-responsive technical assistance to relevant stakeholder groups with a view to improve women and youth empowerment. Capacity building activities would be tailored to the roles and responsibilities of various stakeholder groups in collaboration with universities and non-governmental groups. A forest fire academy (or a continuous education course) would be created and hosted by a consortium of a university and selected NGOs with courses offered on a regular basis benefiting various stakeholders, including first community responders, in particularly the youth.

11. The project would be implemented in the context of Lebanon's (i) National Forest Plan (NFP) 2015-2025 which forms the main forestry policy instrument that is currently being used by the Ministry of Agriculture; and (ii) the updated National Forest Fire Management Strategy (NFFMS) (2023):

- The *NFP* details the government's interventions aimed at fostering sustainable management, coordination, and cooperation mechanisms among both the public and private sectors. The NFP's goals include 1) establishing restoration and rehabilitation plans in degraded lands to counteract soil erosion and desertification, 2) enhancing ecosystem resilience in forestland to mitigate the impact of climate change and other natural hazards, and 3) carbon sequestration. The document further discusses legal, operational and budgetary goals.
- The updated *NFFMS* aims at developing practical measures to reduce the risk of exposure to fires and reduce their social, environmental and economic impacts. In addition, the Strategy aims at preventing intense and destructive fires while avoiding unsustainable fire regimes.

Component 1 – Support for an enabling environment for wildfire management (GEF Grant 1.112 million)

12. Component 1 will enhance the enabling environment for wildfire management to avoid, reduce and reverse land degradation at the national, regional, & local levels. This will be achieved through:

- Building a coordination mechanism to enhance cooperation between MoE, MoA and the DRM Unit on an integrated wildfire risk management;
- Technical support of relevant MoE and MoA regional directorates in support of fire risk management at the regional/local level;
- Efficient and institutionalized communication system for surveillance, alert, early detection and early response to wildfires; strengthen relationship between local civil defense centers and first responder teams in hotspot areas;

- Gender responsive capacity development (incl. training for first responders and local civil defense centers; readiness and engaging in the voluntary carbon market and certification, forensic forest fire investigation, etc.);
- A forest fire academy in collaboration with universities and non-governmental groups to educate and train responders and particularly the youth on matters related to fire risk management and to promote/advance research/studies of relevance;
- Improved strategic and operational planning for sustainable forest and forest fire management;
- Analytical work on the socio-economic potential for wood production and value addition in Lebanon (i.e., pine) and value addition for non-wood products (i.e., medicinal plants, honey, mushrooms) and other economic activities with gender-responsive green jobs potential such as nature-based tourism, 3R (Replace, Reduce, Recycle) approach in forests waste management, & sustainable agriculture;
- Establishment of a national forest fire emergency fund as an institutionalized system;
- Awareness creation campaigns ahead of each fire season will be conducted using various methods and social media.

Component 2 – Investments in improved forest and fire management (GEF Grant \$2.007 million)

13. **Component 2 will provide investments to support forest fire management activities in the context of community-based forest management.** Managing forest and other natural resources in a sustainable manner will reduce fire risks and prevent land degradation. Under component 2 the project will (i) support fire prevention infrastructure and firefighting equipment and tools for first responders and relevant infrastructure, and (ii) support community-based forest management. This will be achieved through:

- Development of gender responsive operational forest fire management plans in “hotspot” zones applying a forest landscape approach;
- Support to first responder teams and local civil defense centers for surveillance, early detection and early intervention in hotspot areas, including fire prevention infrastructure and fighting equipment and tools for first responders and relevant infrastructure;
- Community-based forest management to reduce fire risk while promoting sustainable livelihoods and green jobs, including women and youth empowerment (including support for nature reserve committees and their teams to be trained and equipped to address fire risks in nature reserves);

- Forest and landscape restoration activities applying the LDN response hierarchy to avoid, reduce and reverse land degradation in selected hotspots post burning events (i.e. guidelines for post-fire restoration and rehabilitations, restoration/rehabilitation/stabilization activities, fire risk reduction measures).

Component 3 – Inclusive and Gender responsive, Monitoring and Evaluation (M&E); Knowledge Management and Learning (KM/L); Communications (GEF Grant \$0.177 million)

14. **Component 3 will focus on establishing a gender-responsive M&E system; implementing a KM/L plan and communications.** The M&E system will allow to not only monitor and evaluate the established project targets but also the project's contribution of the project to national targets and international commitments (LDN targets, biodiversity targets and climate NDC targets). Knowledge management and learning opportunities will be identified during project preparation, however, an initial communication has been already established with other Mediterranean countries which face similar threats to their forest ecosystems and landscapes. Linked to M&E and KM/L is the ability to communicate with relevant stakeholders on implementation progress, emerging findings, good practices and success stories. In general, knowledge management and learning as well as communication and outreach aims at disseminating information and emerging results of the project to the various stakeholders for further uptake and fundraising.

15. *M&E.* M&E and learning processes will include routine monitoring and reporting, including participatory monitoring and an independent evaluation of the project results. A dedicated monitoring system consistent with national LDN targets and Sustainable Development Goal (SDG) targets, particularly SDG 15.3 and its indicator 15.3.1 on LDN will be set up and which also allows for gender responsive evaluation and adaptive learning. It will involve all relevant stakeholders to regularly monitor project implementation outcomes, with a particular attention to gender. Relevant tools to monitor LDN will be used such as Tools4LDN integrating Trends.Earth, the WOCAT database and LandPKS will be considered.

16. *KM&L.* During project preparation, a comprehensive KM/L plan will be developed. Knowledge exchange opportunities with other Mediterranean countries experiencing similar threats to their forest landscapes will be explored and supported. A KM/L plan will be developed to reflect on methods to capture and assess existing information, identify appropriate tools and methods for knowledge exchange at the national and regional levels; identify potential knowledge outputs and how gained knowledge can be fed back into project implementation, ensuring gender equality.

More *specifically*, the project's aim is initiative transformative changes to the norms, cultural values and the roots of gender inequalities and discriminations especially through the integration of gender-related issues and opportunities in capacity building and knowledge management activities.

17. Relevant lessons and good practices from other countries and the implementation of projects of similar nature have been considered, including India and Kazakhstan. E.g. the *Strengthening Forest Fire Management in India* project (World Bank), lessons included to develop an institutional incentive to report forest fires and risks, the need for a common classification scheme and methodology for the assessment of economic costs related to fires and the need for planned forest rehabilitation and restoration efforts post-burning events. Lessons from the implementation of the *Kazakhstan Forest Protection and Reforestation Project* (World Bank) include the need for adequate and reliable funding; ensure a sufficient workforce by filling vacancies for front line staff; a trained workforce and institute standard management practices, balance prevention, and post-fire reporting.

18. In addition, close collaboration has been ensured with the PROGREEN Trust Fund Secretariat, which is the knowledge and learning hub for topics related to forest landscape management and forest protection, including the management of forest fire risks.

19. The comprehensive KM/L plan will also describe methods how to learn from relevant projects, programs, initiatives & evaluations (including those listed above), processes to capture, assess and document information, lessons, best practice and expertise generated during implementation, tools and methods for knowledge exchange, learning & collaboration, including knowledge platforms and websites, and how knowledge outputs to be produced and shared with stakeholders (at community, national and international levels).

20. Knowledge generation and learning will be important to achieve the contribute to overall project impact and sustainability as addressing forest fire risks and other threats related to it can only be achieved by engaging multiple stakeholders through a collaborative learning approach. E.g. lessons and good practices can be shared with other communities and municipalities so they can contribute to reducing fire risks in other fire hotspots. The project will also contribute to an enhanced understanding of the link between sustainable forest management and reducing forest fire risks. Lessons and good practices related to this understanding will be shared with other countries in the Mediterranean region faced with similar challenges (e.g. Algeria).

21. The project will also share its experiences on sustainable forest management and restoration contributing to LDN with the GEF, UNCCD and the WOCAT platform³ as well as with other Mediterranean countries participating in the “Agadir Commitment” along with the members of the “Forest and Landscape Restoration Mechanism (FLRM)”.

22. Communications. During project preparation, a plan for strategic communication and outreach will be developed consistent with the emerging M&E system and KM/L plan. It is important to be able to communicate with relevant stakeholders and groups (women and youth in particular) on implementation progress, emerging findings, good practices, and success stories. Apart from a project-specific website, various communication methods will be explored, including blogs, social media, action events during World Environment Day or Forest Day, news paper articles and volunteer opportunities to assist in forest fire risk management.

Component 4 – Project Management (GEF PMC \$0.166 million)

23. This component would finance the operation of a small Project Management Unit (PMU) at the Ministry of Environment which would closely coordinate with the project steering committee made up of representatives from MoE, MoA, the DRM Unit, the General Directorate of Civil Defense and participating municipalities.

24. The MoE will be responsible for the overall management and implementation of the project where a small project management unit (PMU) will be located and directly report to the Minister of Environment. However, the execution arrangements for various project activities will need to be discussed during project preparation, including the M&E arrangements. The PMU will ensure fiduciary management, procurement, ESF compliance and M&E, consistent with World Bank policies and procedures. The PMU will manage the project’s special accounts, prepare consolidated annual work programs and budgets, coordinate procurement and financial management reporting, and coordinate and consolidate periodic progress reports for project activities. The participation of all relevant stakeholders involved in the regular monitoring⁴ and validation of agreed outcomes and outputs, as per the results framework, will be ensured.

25. The role of the PMU and the steering committee would be to support and manage the project implementation by working closely with the responsible National, Governorate and Local Government institutions, including:

³ World Overview of Conservation Approaches and Technologies - WOCAT which is a global network on Sustainable Land Management promoting knowledge sharing and use to support adaptation, innovation and decision-making for SLM. See details at www.wocat.net.

⁴ including the LDN indicators and GEF8 Core indicators

- project governance and oversight through effective stakeholder engagement;
- budgeting;
- annual work planning;
- contract management;
- financial management;
- procurement of goods, works and services;
- technical assistance;
- environmental and social risks management; and
- conducting financial, environmental and social monitoring.

26. *GEF Alternative.* The proposed project builds on the baseline by providing opportunities to address forest fire risks from an enabling point of view and the implementation of actual measures in selected forest fire hotspots in Lebanon. The project will closely work with the MoA which is leading the implementation of the NFP by integrating forest fire risk consideration in operational planning for Lebanon forest landscapes and implementation measures.

27. *Innovation.* The project will have several innovative features related to the proposed business model (bottom-up approach due to the political situation), governance (developing an efficient and effective coordination mechanism among forest-relevant entities), financing (support of the design of a national forest fire emergency fund) and policy (to harmonize sector policies under the National Physical Master Plan of the Lebanese Territory (2005 – 2030)).

28. *Sustainability and potential for scaling up.* The project will work in selected forest fire hotspots to test an integrated approach to forest landscape management and managing forest fire risks. Based on lessons learned and experiences from implementing the approach, there is potential for further scale-up the project approach and outcomes in Lebanon to other forest fire hotspots but also in other countries which are facing similar challenges as Lebanon, mainly in the Mediterranean biodiversity hotspot.

29. *Environmental and Social Considerations.* There will be many environmental and social benefits from the project such as improved forest management with fire management considerations integrated, reduced area of annual forest fires; reduced greenhouse gas emissions, enhanced biodiversity protection through the creation of bio-corridors linking forest fragments and restored degraded forest lands, enhanced and safer access to forests and natural habitats, improved community health and safety due to improved forest fire management, improvement of livelihoods through

creation of job opportunities from forest-based activities like nature based tourism, enhanced enabling environment through establishment of a forest fire academy in collaboration with universities and non-governmental groups with focus on youth, capacity building activities with focus on gender, and establishment of a gender responsive monitoring and evaluation system. The project will also develop a strategic communication and outreach plan to communicate with relevant stakeholders and groups on implementation progress and with particular focus on women and youth.

30. Land use and forest management measures to address wildfire risks may include fire lines, set-back or defensible space in the residential and agricultural ignition zones, wider forest road widths, and the use of water infrastructures (e.g., community water ponds). The potential adverse environmental risks and impacts associated with these activities will include noise and vibration causing disturbances to wildlife and residents; generation of non-hazardous waste; OHS-related risks; public safety risks associated with movement of heavy-duty vehicles and roads closure; and impacts on biodiversity, especially threatened and endemic species within the implementation areas caused by clearing certain areas of forest land which may constitute habitat or biological corridors for threatened wildlife, or critical habitat for endemic floristic species. A biodiversity baseline study will be conducted to identify relevant biodiversity protection priorities, and to inform the planning and implementation of the proposed wildfire risk management (species diversity, threatened species, biological corridors, and critical habitat).

31. Some adverse social impacts may result due to ineffective communication and consultations to include all identified stakeholders and particularly the more vulnerable communities affected by the project and a weak grievance mechanism. The project may also be associated with some risks of sexual exploitation and abuse/sexual harassment (SEA/SH) due to female workers/beneficiaries working near male workers/beneficiaries (low). These social risks can be readily and effectively mitigated through continuous and inclusive consultations sessions, a robust grievance mechanism with multiple uptake channels that are widely and effectively disseminated, awareness raising sessions on prevention and control of SEA/SH, signing of codes of conduct, and strengthened project GM which is sensitive to SEA/SH complaints.

32. During the preparation stage, the project management unit which will be set up in the Ministry of Environment will prepare a Stakeholder Engagement Plan (SEP), Labor Management Procedures (LMP), the Environmental and Social Commitment Plan (ESCP) and an Environmental and Social Management Framework (ESMF). All instruments will be cleared and disclosed by the appraisal stage.

33. MoE has had previous experiences with managing World Bank projects and complying with the Banks safeguards policies. A recently approved GEF project “Reduction of Unintentional POPs through Waste Management in a Circular Economy (UPOPS) (P172770)” will be the first experience of MoE to work on a project under the ESF. More trainings on ESF will be organized for the PMU, MoE and other ministries involved during project preparation. Combined training sessions with the PMU staff for the UPOPS and the GATE projects will be organized. The World Bank task team will provide capacity building and training as needed throughout the project life cycle.

34. A Financial Management (FM) and procurement assessment will be conducted for MOE during project preparation. Key risks will be identified, and mitigating measures will be proposed to ensure that the Bank funds are used for intended purposes. MOE through the PMU will be the executing agency of the project and will have overall fiduciary responsibility.

Theory of Change

Problems/Issues	Component Activities	Outputs	Intermediate Outcome	PDO and PDO indicators
Challenges arising from the implementation of the National Forest Fire Emergency Plan, lack of integration of fire risk considerations in forest management plans, and weak coordination among government entities with a mandate related to forests	Support for an enabling environment for wildfire management	<ul style="list-style-type: none"> • Coordination mechanism to enhance cooperation between MoE, MoA and the DRM Unit on an integrated wildfire risk management in the context of sustainable forest landscape management; • Communication system for surveillance, alert, early detection and early response to wildfires; • Trained first responders and local civil defense centers; trained forest guards on forensic forest fire investigation; • Forest fire academy in collaboration with universities and non-governmental groups; • Agreed guidelines for developing operational forest management plans with forest fire management considerations integrated; • National forest fire emergency fund as an institutionalized system; the fund would also provide resources for fire prevention measures as part of forest management (e.g. reduction of dead biomass, fire lines) • Studies on readiness and engaging in the voluntary carbon market and certification; socio-economic potential for wood production and value addition in Lebanon (i.e., pine) and value addition for 	<ul style="list-style-type: none"> • Increased awareness and institutional capacity on of relevant MoE and MoA regional directorates in support of fire risk management at the regional/local level; • Efficient and institutionalized communication on wildfire risks, events and post-fire activities at national, district and municipal levels; • Strengthened relationship between local civil defense centers and first responder teams in hotspot areas. • Gender responsive capacity developed on various topics related to forest management and fire risk management • Increased awareness in communities ahead of each fire season with focus on fire hotspots. 	<p>The project development objective (PDO) is to reduce wildfire risks by improving sustainable forest landscape management in selected fire hotspots in Lebanon.</p> <p>PDO indicators:</p> <ul style="list-style-type: none"> ▪ Forest area brought under improved management plans based on SFM principles (ha) ▪ Unmanaged forest area under annual high fire risk and burnt (ha/year) ▪ People in targeted forest and adjacent communities with increased monetary or non-monetary benefits from forests (#, disaggregated by gender) ▪ Net GHG emissions (tons CO₂e) ▪ Share of project beneficiaries who report being satisfied with project interventions (livelihoods, forest management, other) (percent, disaggregated by gender and ethnic group)



Problems/Issues	Component Activities	Outputs	Intermediate Outcome	PDO and PDO indicators
Lack of strategic investments in forest fire prevention; efficient and timely response to forest fire events; and post-forest fire activities	Investments in improved forest and fire management	<p>non-wood products (i.e., medicinal plants, honey, mushrooms);</p> <ul style="list-style-type: none"> • Training program on sustainable forest and forest fire management for first responders and local communities in forest fire hotspots, including on drivers of forest degradation; • Forest guards, first responders and municipalities (civil defense centers) equipped with tools, materials and technology for surveillance, early detection and early intervention in hotspot areas; • Inclusive and gender responsive operational forest management plans in "hotspot" zones; • Community-based forest management to reduce fire risk (including support for nature reserve committees and their teams to be trained and equipped to address fire risks in nature reserves) and other related drivers (e.g. pests and diseases, tourist awareness campaigns); • Forest landscapes in selected hotspots restored post burning events (i.e. following guidelines for post-fire restoration and rehabilitations, restoration/rehabilitation/stabilization activities, fire risk reduction measures). 	<ul style="list-style-type: none"> • Increased capacity of forest guards, first responders and municipalities to manage forests sustainably and forest fires; • Communities and municipalities enabled to implement operational management plans that integrate fire risk considerations and promote sustainable harvesting levels for wood and non-wood products; • Reduced forest fire events • Communities with increased income from SFM and new job opportunities from forest-based activities; • Forest landscapes impacted by fire events rehabilitated using local climate-resilient species; • Fragmentation of forests reduced by building bio-corridors 	<ul style="list-style-type: none"> • Forest area with enhanced biodiversity protection (ha)



Problems/Issues	Component Activities	Outputs	Intermediate Outcome	PDO and PDO indicators
Lack of knowledge on good practices for integrating fire risk considerations into forest management planning and implementation	M&E and Knowledge Management	<ul style="list-style-type: none"> • Good practice notes e.g. on fire risk management (full cycle: prevention, addressing fire events, post-fire activities); the link between sustainable forest management and fire risk reduction • Knowledge exchange events e.g. on forensic fire investigation; • South-South visits to other Mediterranean countries with similar challenges (e.g. Algeria, Spain, Greece) • Community outreach program to raise awareness of fire risks and risk mitigation measures (incl. outreach to tourism operators and tourists) 	<ul style="list-style-type: none"> • Increased knowledge on various topics relevant to managing forest fires in the context of SFM (incl. role of sustaining or increasing biodiversity, i.e. species selection for enhanced resilience of forest ecosystems); • Increased collaboration with other countries facing similar challenges; • Increased access to international good practices on sustainable forest management and managing forest fires • Increased awareness on causes for forest fires and mitigation actions at community level 	

The Need for Fire Stations

The issue of inadequate number of fire stations is crucial for public safety in Lebanon. Here are some relevant points:

1. Lebanon's Fire Station Challenges:

- Lebanon faces challenges related to lack and /or outdated fire stations¹.
- The existing firehouses do not meet modern safety standards or adequately serve the community.

2. Proposed Solutions:

- Next is a general proposal to construct a fire stations in the jurisdictions of each Union of Municipalities in Lebanon. Lebanon.
- Costly but Necessary: While the project would be expensive, it is considered necessary for public safety and safeguarding Lebanon's dwindling forests.
- Improved Facilities: The new stations design should include more firefighter bunk rooms, a large community room, and enhanced training facilities.

3. Community Support and Funding:

- To address the lack of fire stations in the country, **support and funding are crucial.**
- Advocacy efforts, grant proposals, and collaboration with local and International authorities can help secure resources for new fire stations.

To note is that transparency, ethics, and efficient resource allocation are essential when implementing such projects.

PART TWO

General Proposal to Construct a Fire Station in the Jurisdictions of Each Union of Municipalities in Lebanon

Over the years, as the population grew in the Lebanese Governorates and more people and businesses moved out of large cities to suburban and rural areas.

Many of the present fire stations in Lebanon are located away from those new population centers for two main reasons.

First, prime real estate for new fire stations quickly became unaffordable for local governments.

Second, many residents adopted a “not in my backyard” attitude because they didn’t want the noise and traffic they associated with a fire station disrupting their quiet suburban neighborhoods.

Fire Station Design: Recommendations for New Fire Stations in Lebanon:

Green Construction

When designing and building a new fire station, going green is an area for strong consideration. Also maximize the use of energy-saving technologies.

These newer fire stations should provide a reduced carbon footprint in the community, greater operating efficiency and reduced operating costs.

Know the Town Community

When beginning the planning process for a new fire station, fire service leaders should ensure that they are informed about the community development planning process, which will provide a better understand of where a new fire station fits into overall planning, what type of station best meets the community’s needs and how to best integrate into planned development. It can also provide potential funding opportunities for construction.

Financial Obstacles

It is necessary to recognize that in the present economic situation in Lebanon Municipalities as well as communities would not be willing to pay for a new fire station.

The members of a town's community would be more likely to give their support if they truly understand three things.

- What are the details of the new Fire Station?
- Why the current situation is not delivering those services to the Town.
- How a new Fire Station in a municipality (or Union) will address these deficiencies in service delivery?

In short it is necessary to create an educated and supportive community.

Four Planning Strategies

Getting the most for the design and construction budget is an important goal.

Here are four strategies.

1. **Collaborate with other Municipalities or departments.**
2. **Collaborate with other Towns community groups.**
3. **Collaborate to create a training facility within a fire station.**
4. **Collaborate with a neighboring fire department.**

The 5 Essential Elements of the 21st Century Fire Station

There are five essential elements of the modern-day fire station:

- Apparatus bays
- Sleeping quarters
- Residential areas
- Recreational facilities
- Training facilities

Stations lacking in any of these areas should consider renovating their existing firehouse or building a new station.

The Fire Station Built for the Future: Energy-Efficient Designs

More and more architects and engineers are designing and building structures with sustainability in mind. Various sustainable design strategies and elements exist, many of which are easy to incorporate into a fire station.

Green Roof

A green roof is a flat roof that can serve as both a roof deck and a rooftop garden. Adding plants, shrubs, and other types of greenery to a roof minimizes the amount of sunlight that penetrates the roof. This keeps the building cooler, reduces energy costs, and minimizes energy usage.

Energy-Efficient Windows and Water Fixtures

With energy-efficient windows and low-flow water fixtures, fire stations can protect resources and reduce monthly energy costs. The size and placement of windows can increase ventilation and provide more natural lighting to further reduce costs.

Solar Power

Solar panels produce power and lessen reliance on gas, oil, and other fuel sources that can harm the environment. Switching from traditional heating and cooling systems to solar power is yet another way to save on utility costs.

Energy-Efficient Lighting

Something as simple as installing LED lighting can make a fire station more energy efficient. LED bulbs use 75% less energy and last 25 times longer than incandescent light bulbs.

Sustainable design in a fire station benefits the firefighters, the community, and the environment as a whole.

Co-Locations

Many communities choose to merge fire and local police stations into co-locations. Combining fire and police resources into one structure helps reduce construction costs.

If the structure is built with energy efficiency in mind, it will save them both ongoing utility costs as well.

Outdoor Recreational Areas

Besides indoor fitness facilities, fire stations can provide firefighters with outdoor recreational areas.

Outdoor recreational spaces should go on the house side of the fire station.

Rentable Public Spaces

Adding a fire hall that members of the community can rent for parties and events provides two key benefits:

1. It helps the department generate revenue from rental fees
2. It bolsters community engagement

Fire halls can also serve as meeting rooms and community centers. Welcoming community members into the fire station is also a way to get people engaged with public safety. This is especially important in communities where the fire department relies on volunteers.

Private Sleeping Quarters

Private sleeping quarters with a private bath promote better sleep habits. Private beds promote improved mental health and well-being, making firefighters better at what they do.

Budget

Budget is important in every project. It must be established early in the process and must be realistic. To successfully manage the budget, it must be monitored continuously throughout the decision-making process. When changes in construction occur, there may be an adjustment in the contract. If work is added, the contractor must be paid. If work is taken out, the owner gets a credit. It must be fair both ways. Managing the budget is key to a successful project. It starts at the outset and continues through every step up to and including final inspection and close out.

Designing and building a fire station is a very special and unique experience. It is an opportunity to build for the future and to build a better fire station. This requires teamwork to make it happen. The reward for a job well done is a sense of satisfaction and accomplishment.

Typical Space Description

- Reception/Waiting
- Vestibule
- Lobby/Waiting/Display
- Service Counters
- For City Hall & administration for Fire (Front Desk) one person, plan for two in the future, some open office
- Shared Amenities
- Break Room/Kitchenette
- Print/File/Copy/Office Supply Area
- Meeting Room - Small
- Meeting Room - Large
- Closed Session Room
- Staff Restroom Men
- Staff Restroom Women
- Mother's Room
- Fitness Room
- City Administration
- City Administrator
- Offices - large
- Offices - small
- Building Official
- Future Private Offices
- Plan for Future
- IT
- Future, Workbench
- Records Storage
- Records Vault
- 2-hour fire rated / combined with elections storage? / server protected within
- Elections Storage
- 2-hour fire rated / combined with records vault?
- Council Chambers
- Council Chambers (seat count: 35-50)
- Warming Kitchen
- Elections will take place in here, Community Room
- A/V Booth
- Storage
- Tables and chairs
- Closed Session Room
- Duplicates as a secondary conference room
- Training Room - Fire
- Training Room
- 50-100 people, BLS Training
- Warming Kitchen
- Shared with Council Chambers Warming Kitchen, if possible
- Table/Chair Storage
- Fire Hall
- Fire Chief Office
- Meetings within his office with foot traffic from pedestrians
- Open Office/Report Writing
- Private Offices
- Captains, Lieutenants, Squad
- Record Storage
- Day Room
- Dining table
- Bunk Rooms
- Individual 5, up to 8
- Communications/Radio Room
- Apparatus Bays + Extractors (Hot Zone)
- 20x80 - No circ. factor
- EMT Vehicle Storage
- Decontamination Shower/Restroom
- Hose Tower
- Medical Supplies (some supplied on rescue truck)
- Roof access
- Controlled access
- Turnout Gear Room w/ Call Monitor on Wall
- 35 Lockers
- Turnout Gear Storage
- Engineer Tools Room/Work Bench
- SCBA/General Laundry

- General Storage (training prop, etc.)
- Unisex Shower/Toilet
- Locker Room
- Off Locker Room
- Extractors
- 35 small lockers
- Pole
- Support Area
- Public Men's Restroom
- Public Women's Restroom
- Elevator / Elevator Equipment
- 10x10 Elev. + 10x10 (Equip.) + 2nd Fl. Elev.
- Stair
- Janitors Closet
- Mechanical/Elec. Room
- Building Maintenance Storage
- Generator
- Indoor
- Circulation Factor
- Not including App Bays

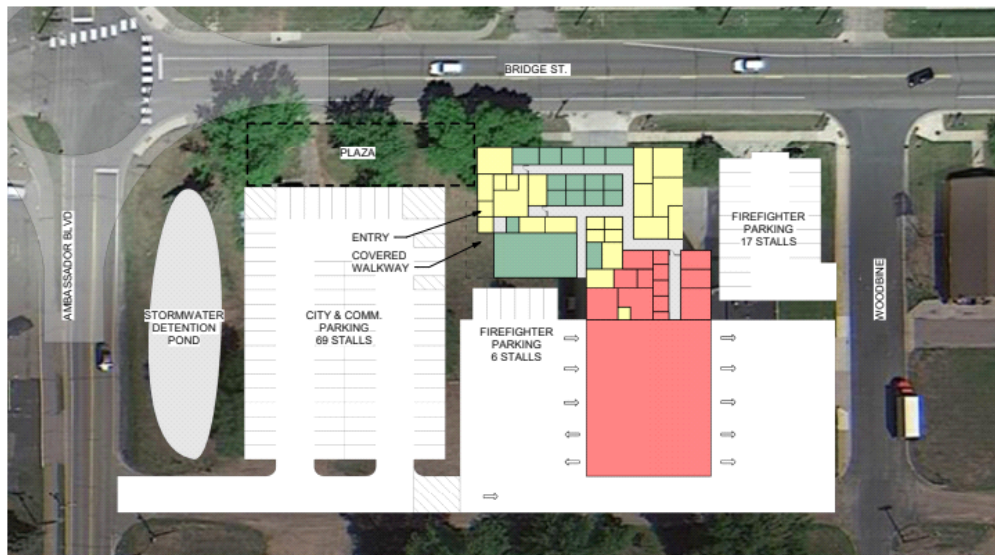
Cost components of a typical Fire Station

Estimating typical costs for building a fire station involves several factors, including location, size, design, and specific requirements. However, I can provide a general breakdown:

1. ***Land Acquisition***: The cost of purchasing or leasing land for the fire station.
2. ***Construction Costs***:
 - ***Building Structure***: Includes materials, labor, and construction management fees.
 - ***Utilities***: Plumbing, electrical, and HVAC systems.
 - ***Firefighting Equipment***: Fire engines, hoses, gear, and communication systems.
 - ***Apparatus Bay***: Construction of the garage area for fire trucks.
 - ***Living Quarters***: Sleeping quarters, kitchen, bathrooms, and administrative spaces.
 - ***Safety Measures***: Fire-resistant materials, alarms, and sprinkler systems.
3. ***Architectural and Engineering Fees***: Design, permits, and inspections.
4. ***Furnishings and Fixtures***: Furniture, appliances, and office equipment.
5. ***Landscaping and Parking***: Outdoor areas and parking spaces.
6. ***Contingency***: Allowance for unexpected costs.

Keep in mind that costs can vary significantly based on local market rates, labor availability, and specific project details. Consulting with architects, contractors, and fire department officials will provide more accurate estimates.

Site Analysis Options Examples





The first floor plan shows the proposed separation of departments with their shared spaces. Green represents City Hall spaces, Red represents Fire Station spaces, and Yellow represents shared amenities and support spaces. Multiple iterations were explored before the team settled on the above layout.



Conclusion

Fire stations must be equipped and organized to promote quick response times. But they also have to function and meet the daily needs of the firefighters that live and work within them.

From renovations to new structures, there are many ways that public safety officials can bring their fire stations up to date.

BUSINESS PLAN FOR A FIRE DEPARTMENT IN JOUN

Here's a detailed business plan for establishing a fire department in Joun, Lebanon. This comprehensive plan includes sections on the executive summary, objectives, services offered, market analysis, operational plan, financial projections, and funding requirements.

Business Plan for Joun Fire Department

Executive Summary

Business Name: Joun Fire Department

Location: Joun, Lebanon

Business Model: A municipal fire department providing comprehensive fire protection, emergency medical services, and community safety education.

Vision: To create a safe and resilient community through effective firefighting and emergency response services.

Mission: To protect lives, property, and the environment by delivering professional firefighting services, emergency medical response, and community education.

Business Objectives

1. Establish the Fire Department: Complete construction and operational setup within 12 months.
2. Community Engagement: Conduct at least 12 fire safety workshops and community outreach events in the first year.
3. Emergency Response: Achieve an average emergency response time of under 5 minutes.
4. Safety Inspections: Perform a minimum of 200 fire safety inspections annually.

Services Offered

1. Fire Suppression: Rapid response to residential, commercial, and industrial fires.
2. Emergency Medical Services (EMS): Basic life support and medical assistance during emergencies.
3. Fire Prevention and Education: Conduct fire safety inspections, enforce fire codes, and provide educational workshops.
4. Rescue Services: Technical rescue operations for accidents, confined spaces, and hazardous material incidents.
5. Community Outreach Programs: Initiatives focused on fire safety, emergency preparedness, and disaster response training.

Market Analysis

Industry Overview

Fire departments are essential for public safety, protecting communities from the dangers of fires and emergencies. They also contribute to disaster preparedness and community resilience.

Target Market

- Primary: Residents of Joun, including households, schools, businesses, and local institutions.
- Secondary: Nearby municipalities that may require mutual aid or assistance.

Competitive Analysis

Assess existing emergency services in Joun and surrounding areas to identify gaps in service delivery and ensure the new fire department complements existing services.

SWOT Analysis

- Strengths: Skilled personnel, community support, and comprehensive service offerings.
- Weaknesses: Initial funding requirements and staffing challenges.
- Opportunities: Potential partnerships with local organizations and government agencies.
- Threats: Budget constraints and competition for funding.

Marketing Strategy

1. Branding: Establish a professional brand focused on safety, reliability, and community service.
2. Community Outreach: Develop fire safety awareness campaigns in schools and local events.

3. Digital Presence: Create a website and utilize social media to disseminate safety information and department updates.

4. Local Media: Leverage newspapers, radio, and community boards for advertising and outreach.

Operational Plan

Facility Overview

- Location: Centrally located in Joun for optimal response times.
- Size: Approximately 4,000 square feet, including vehicle storage, administrative offices, and training facilities.

Staffing Plan

- Fire Chief: Responsible for overall management and operations.
- Firefighters: Trained personnel for emergency response and public education.
- Administrative Staff: Manage scheduling, budgeting, and community engagement.
- Volunteers: Community members assisting with outreach and emergency response.

Equipment and Technology

- Fire Apparatus: Fire engines, rescue vehicles, and ambulances.
- Protective Gear: Firefighter uniforms, helmets, and medical equipment.
- Communication Systems: Radios and dispatch systems for efficient coordination.

Financial Plan

Startup Costs

Item	Cost (USD)
Land Acquisition	\$150,000
Construction and Renovation	\$800,000
Fire Apparatus and Equipment	\$400,000
Communication Systems	\$50,000
Initial Training Programs	\$25,000
Marketing and Community Engagement	\$15,000
Contingency Fund	\$60,000
Total Startup Costs	\$1,500,000

Annual Operating Expenses

Expense	Cost (USD)
Salaries and Benefits	\$350,000
Utilities and Maintenance	\$40,000
Training and Professional Development	\$30,000
Equipment Maintenance	\$25,000
Insurance and Licensing	\$20,000
Community Programs	\$10,000
Miscellaneous Expenses	\$5,000
Total Annual Operating Expenses	\$480,000

Revenue Projections

- Municipal Funding: Estimated at \$300,000 annually from local government budgets.
- Grants and Donations: Target \$150,000 annually from public and private sources.
- Fee-for-Service Programs: Estimated at \$40,000 annually from fire safety inspections and training sessions.
- Total Annual Revenue: \$490,000.

Financial Projections

- Year 1: Projected revenue of \$490,000; expenses of \$480,000, resulting in a profit of \$10,000.
- Year 2: Increase community engagement leading to projected revenue of \$520,000; expenses of \$490,000, resulting in a profit of \$30,000.
- Year 3: Establish consistent funding and increased service utilization, projected revenue of \$550,000; expenses of \$500,000, resulting in a profit of \$50,000.

Funding Requirements

Seeking \$1,500,000 to cover startup costs and initial operating expenses from:

- Government support
- Grants from fire safety foundations and community organizations
- Fundraising campaigns and community events

Implementation Timeline

Phase	Duration
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Planning and Licensing	3 months
Construction and Renovation	9 months
Staffing and Training	3 months
Marketing and Community Outreach	3 months
Grand Opening	Month 12

Conclusion

The Joun Fire Department is designed to enhance public safety through comprehensive firefighting and emergency services. By providing essential services and fostering community engagement, the department aims to significantly improve safety and preparedness in Joun.

This business plan provides a structured approach to establishing a fire department in Joun, addressing community safety needs and potential for growth. Adjustments can be made based on local conditions and stakeholder feedback as the project progresses.

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From Wikipedia, the free encyclopedia

Source: Fire Regime Analysis in Lebanon (2001–2020): Combining Remote Sensing Data in a Scarcely Documented Area; October 2022

Authors: Georgia Majdalani, Nikos Koutsias: University of Patras, Ghaleb Faour: National Council for Scientific Research, Lebanon; Jocelyne Gerard: Saint Joseph University, Lebanon

Article in Asharq Al Awsat Newspaper

النيران تواصل التهام أحراج بأقليم الخروب في لبنان

لجنة البيئة: 99% من الحرائق مفتعلة

لينا صالح: بيروت

نُشر: 30-12:59 سبتمبر 2023 م - 16 ربيع الأول 1445 هـ

Maps of Lebanon: The Areas with risk of fires

Source: Forest Fire Fighting in Lebanon Using Remote Sensing and GIS: Technical Report

Author: Ghaleb Faour PhD: National Council for Scientific Research, Lebanon | CNRS · Center for Remote Sensing

The World Bank: Lebanon's forests: Dousing fire risks through stronger forest management

Lebanon's forests: Dousing fire risks through stronger forest management (worldbank.org)

Andrea Kutter September 18, 2023

Caption 1: The forest fire risk map for Lebanon on August 12, 2023. Much of the area indicates a high risk of wildfires. (Source: Conseil National de la Recherche Scientifique de la République Libanaise)

Caption 2: Lebanon's forest laws include recommendations on managing private forests, but landowners are not legally forced to manage forested areas, including by ridding it of flammable dead plant matter. (Photos: Khaled Taleb)

About the Lebanon Forest Note: Country Forest Notes are centerpieces of the World Bank Group Forest Action Plan (2016–2020) and the World Bank Climate Action Plan (2020–2025). The Lebanon Forest

Note assesses the status of Lebanon's forest, the pressures on forest landscapes, and the opportunity areas for action. The work was funded by PROGREEN, a multi-donor trust fund managed by the World Bank.

Safeguarding Lebanon's forests through fire prevention: Lebanon celebrates success in forest fire prevention with a 90% reduction in two years, but the country faces a new threat: deliberate fires burning southern regions. By **EFIMED** - June 19, 2024

Towards COP27: Arab Regional Forum on Climate Initiatives to Finance Climate Action and the SDGs Project Fact Sheet National Emergency Plan for Forest Fire Prevention, Awareness and Readiness LEBANON

Community-based Wildfire Risk Management in Lebanon's Vulnerable Landscapes: World Bank: Andrea Kutter (Task Team Leader) ; Senior Natural Resources Management Specialist ; Sandrine Jauffret (Co-Task Team Leader)

Building a New Station: A Primer for Small Fire Departments

Aug. 27, 2019

Scott Garner of Garner & Brown Architects, PA, offers a rundown of things small fire departments need to consider when planning to build a new station. Scott Garner **Related to:** Garner & Brown Architects, PA

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