

Akkar Trail: How a Local Firefighting Initiative Became a National Model for Lebanon

Jana Rashid, Lebanon



Figure 1: Photo of forests in Akkar, northern Lebanon

"The fires burned crops and caused extensive damage to water tanks and irrigation hoses. We still haven't been able to repair the damage or restart farming this year," said Mahmoud Saadeh, a resident of Akkar governorate in northern Lebanon, reflecting on the devastation caused by last year's wildfires to the agricultural lands.



Figure 2: The effects of wildfires in Akkar forests

[The World Bank's 2024 report](#) ranked Lebanon as the second least prepared country to deal with climate change. Rising temperatures have led to an increase in wildfires, reducing biodiversity and increasing the country's risk of desertification. Between October 26, 2020, and September 4, 2023, the Akkar region alone had [148 fire alerts](#).

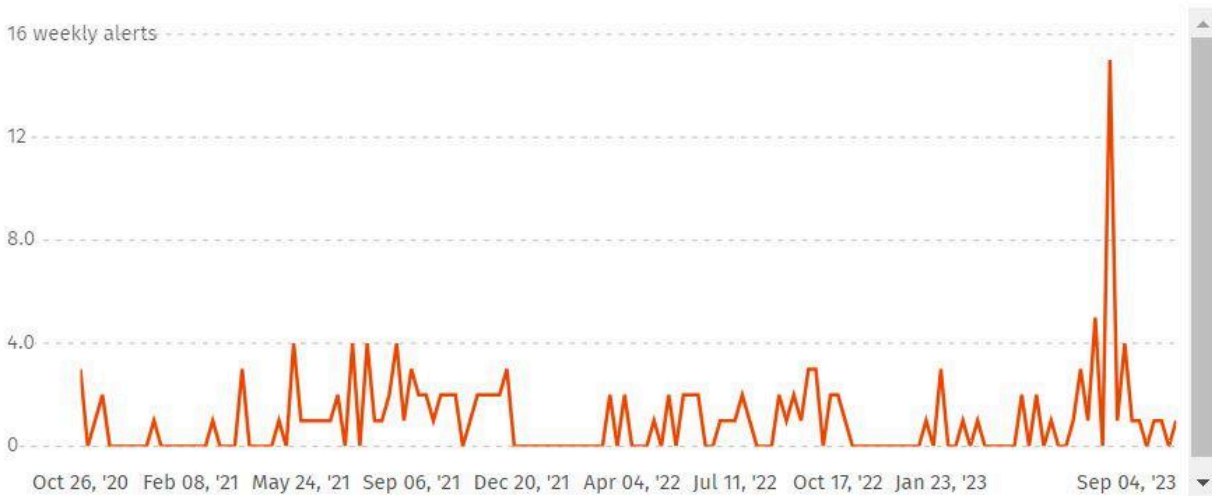


Figure 3: Fire alerts in Akkar

[The UN Climate Change Knowledge Portal](#) predicts that climate change will have many different effects on Lebanon's environment, economy, social structure, public health, and infrastructure. Lebanon's ongoing economic crisis, which began in 2019, has severely impacted

the country's ability to adapt across all sectors. It highlights the climate threat to Lebanon's biodiversity, driven by an increase in wildfires linked to rising temperatures and desertification.

Higher temperatures cause vegetation to dry up, making it easier for wildfires to start and spread. [With July 4 being the warmest day on record globally, it is clear that climate change is a big future risk.](#)

Nouhad Awad, Campaigns and Global Communications Coordinator at Greenpeace's "Ummah for Earth" project, emphasized the severity of Lebanon's wildfires, pointing out that many were deliberately ignited. She explained that recurring heatwaves and rising temperatures, especially in October, have dried the soil, leading to unprecedented and rapidly spreading fires. Awad called on the Lebanese government to declare a climate emergency and develop plans to address anticipated climate incidents

Wildfires

Amidst Lebanon's climate changes, devastating wildfires have broken out in various regions, including Akkar's forests in the north of Lebanon. Akkar, one of the most marginalized governorates in Lebanon, faces significant challenges in combating climate change, with poverty affecting 63% of its population.

According to [Global Forest Watch](#), between 2001 and 2022, Akkar lost 853 ha of tree cover due to fires and 512 ha from other causes. The most significant loss occurred in 2021 when 370 ha – 87% of that year's total tree cover loss – were consumed by fires. Over the same period, Akkar recorded the highest average annual tree cover loss due to fires, at 39 ha per year.



Figure 4: Trees affected by wildfires in Akkar

Dr. Danny Obeid, a lecturer at Lebanese University's Faculty of Agriculture, describes how forest fires can have a huge and complex impact on agriculture. These flames cause crop loss and agricultural destruction, which have a direct impact on production levels. Additionally, smoke from fires can taint the air and soil, reducing their quality and fertility. Furthermore, forest fires emit large amounts of greenhouse gasses into the atmosphere and harm local fauna and biodiversity. In this regard, Sandra Sleiman, a biodiversity expert in wild mushroom studies, claims that climate change has adverse effects on the growth of mushrooms and plants, with their distribution altering dramatically as temperatures rise. She observes that severe fires affect the ecology, particularly as Akkar has the highest biodiversity in Lebanon.

The fires have harmed various species of animals and plants, including the recently discovered "Platinum Terra" flower, a type of orchid found in Akkar in 2018. Many slow-moving animals suffer tragic fates in these fires.

The majority of wildfires in Akkar have destroyed ecologically significant places, including habitats for newly recognized, rare, and threatened plant species like the "Iris" plant. The group of iris contains eight recognized species in Lebanon, all of which are threatened with extinction, including the "Basalt Iris" and "Iris Sofarana."

The "Akkar Trail" initiative: A community-based effort to prevent wildfires

The "Akkar Trail" initiative for wildfire prevention stands out as a success story for positive change amid these environmental and climate-related concerns. It came from the Akkar mountains in northern Lebanon, where a group of young people from the area are determined to tackle the effects of climate change and fight fires.

Initially conceived in 2012 as a local initiative to protect the biodiversity of the Akkar region, it has since transformed into a leading force for wildfire prevention and environmental sustainability in Lebanon. In 2020, the "Akkar Trail" team was formally established to combat wildfires.

The initiative began as a group engaged in ecotourism and organizing hikes. It grew over time into a search for various plant and animal species to learn about the region's vast biodiversity. With the rising frequency of fires in Akkar and their impact on biodiversity, Khaled Taleb, the founder of the "Akkar Trail" initiative and an agricultural engineer from Mish Mish, southeast of Akkar, decided to form a team to begin firefighting operations.

Their first operation was putting out a fire in the town of Mish Mish, which is 1,100 meters above sea level in Lebanon's rugged terrain. The blaze destroyed the area's Juniper trees, which have great cultural value for the locals because they are one of the region's most resilient tree species. The Juniper tree eventually became the team's logo.

The team relied on the region's early warning system and swift response to restrict the spread of fires, as it employs a rapid ground combat approach and extends hundreds of meters of hoses into the forests.

Regarding the initiative's funding, Taleb stated that they rely on donations from individuals both inside and outside Lebanon. Despite the modest size of these contributions, the team of 15 volunteers has made great progress, establishing itself as one of Lebanon's best firefighting teams. The team's efforts have grown beyond the governorate of Akkar, with members now responding to fires throughout Lebanon. What started as a local initiative has developed into an officially registered environmental association with the Ministry of Interior.

Due to their efforts and successes in a short period of time, the team was allowed to train in a firefighting training camp in Poland, where they were able to network with international forest firefighting groups from Europe and America, share their experiences, and transfer these acquired experiences to Lebanon. The team has become a role model!

Taleb shared his vision to establish the "Akkar Trail Firefighting Training Academy," aimed at equipping teams with the skills to respond swiftly to fires affecting the region. As climate change increases the risk of wildfires, the need for quick action is critical, and the region requires a well-trained youth force capable of containing fires and preventing further damage.

Achievements on the ground

The "Akkar Trail" team has successfully responded to over 100 fires, gaining valuable experience that they now share with other regions across Lebanon. Taleb anticipates that the

summer of 2024 will present significant challenges due to climate change and the high temperatures experienced in recent years.

In addition to firefighting, the team has set up a small-scale laboratory to support master's students in their research on biodiversity preservation. The lab currently assists over ten students. Moreover, the group has established a seed bank for rare plant species and implemented plant tissue culture techniques, successfully cultivating the first orchid blossom in their lab.



Figure 5: The “Akkar Trail” Laboratory

The team has also developed two specialized vehicles for Lebanon's high-altitude terrains. These vehicles are designed and equipped to travel deep into forests and fight fires in remote, difficult to-reach regions. They are particularly effective in extending water hoses up to 600 meters or more into the forest.

In addition, a third vehicle, similarly equipped and owned by the Union of Municipalities of Jurd

Al Qayteh in Akkar, is set to join the fleet. This vehicle will support local first-response teams comprised of individuals from fire-prone areas, thereby improving the region's firefighting capabilities.



Figure 6: Akkar Trail vehicles

The "Akkar Trail" team equipped these vehicles locally in the governorate of Akkar. They are distinguished by their ability to perform specific tasks in rugged areas. Each vehicle is equipped with fiberglass water tanks holding 900 liters, high-pressure water pumps, and hoses extending up to 500 meters (10 mm diameter) and 150 meters (1.5-inch diameter).

The vehicles can work separately or with several other ones to increase efficiency. Each vehicle also includes various equipment and manual equipment to function in dense forests, benefiting from the highest quality and performance-efficient equipment available in the local market.

The volunteers at the "Akkar Trail" team begin by drafting a fire prevention plan, followed by setting up an automatic monitoring and early warning group through "WhatsApp". The team circulates fire risk advisories issued by the National Council for Scientific Research and the Fire Laboratory at Balamand University in Koura, northern Lebanon.

Once fires are detected and their severity assessed, the team coordinates with the Lebanese civil defense to move to the fire site, collaborating with local authorities, municipalities, and the

Ministry of Environment to help extinguish the fires. Afterward. The "Akkar Trail" team also compiles damage reports, which are used to improve future fire prevention and response strategies.

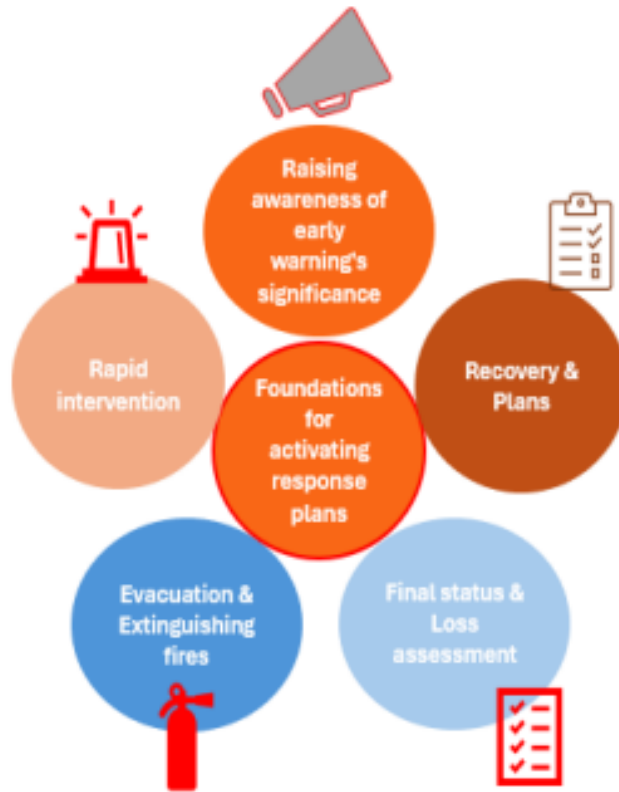


Figure 7: A diagram illustrating the coordinated actions during wildfire outbreaks.

Ali Khader Hassan, a 33-year-old Lebanese citizen, said that the Ghazrata region experienced the largest fire in Akkar in 2023, resulting in significant damage to much of his green spaces, which included oak and pine trees.

He emphasized the critical role of the rapid response by the "Akkar Trail" team, whose swift actions helped contain the fire and minimize the damage. Hassan highlighted the need for stronger support, both financial and moral, for teams like "Akkar Trail," acknowledging the invaluable efforts of these young responders in protecting the region.



Figure 7: Damage caused by wildfires

In addition to the "Akkar Trail" team, other first response teams operate throughout the Akkar region, including one linked with the Union of Municipalities of Jurd Al Qayteh, which has roughly 100 members, including women. The team works in several regions, including Akkar al Atika, Qabayat, al-Jouka, and Danniyeh. Several other teams also operate in the Danniyeh area, including two teams affiliated with the Medical Association and the first response team led by the Women's Association, which is headed by fire expert Ali Musa.

Ali Musa stressed the critical role of first responders in the region and the significance of assisting these groups with financial aid and resources to improve their operations. He also underlined the importance of partnership between the Lebanese government and these teams. Musa emphasized the necessity of completing study before assisting, stating that it is critical to assess the region's needs, examine the soil type, and engage with local experts to establish science-based methods for efficiently combating wildfires.

The Role of the Lebanese Government

[A report published on the Lebanese Ministry of Environment's](#) website highlights the significant impact of climate change on Lebanon's forests, which face challenges such as degradation, pest infestations, wildfires, and harmful practices. These factors threaten the forests' ability to survive and grow, particularly as rising temperatures—up by two degrees Celsius over the past 30 years—intensify the situation.

Lea Kay, Director of Climate Change Projects at the Lebanese Ministry of Environment, emphasized that wildfires pose a serious risk to the country's vegetation and accelerate the degradation of Lebanese forests. The most fire-prone areas are those close to urban regions and at altitudes below 1200 meters, particularly pine forests called (P. Pinea) and (P.Brutia).

Additionally, the increase in atmospheric carbon dioxide alters the carbon-to-nitrogen balance in plant tissues, reducing the nutritional quality of the plants and prompting insects to consume more leaves, leading to greater tree damage and pest infestations.

To address this growing threat, the Ministry of Environment has developed and initiated an emergency fire management plan. This includes creating first-response teams as well as identifying over 15 fire-vulnerable zones. However, Lebanon's ability to respond remains constrained due to the ongoing economic crisis, underscoring the need for comprehensive programs that prioritize both fire prevention and response efforts.

Khaled Taleb acknowledges the collaboration between the initiative, the association, and the Ministry of Environment, particularly the involvement of Minister Dr. Nasser Yassin, who actively supports the "Akkar Trail" team by connecting them with donors and providing assistance within the ministry's available resources. While funding is still limited due to Lebanon's economic situation, cooperation is substantial and likely to continue.

The Lebanese government's national adaptation plan for 2023 outlines several measures to address wildfires and climate change. These adaptation strategies aim to support the country's natural resilience and prepare for future challenges. Key measures include strengthening legal and institutional frameworks, integrating landscape planning into development projects, raising public awareness and education, and advancing forest management plans to improve sustainability and response capabilities.

The governorate of Akkar: obstacles and challenges

The governorate of Akkar faces many challenges due to its geographical and topographical characteristics. Its rugged terrain and steep slopes contribute to the rapid spread of wildfires, while also complicating access to firefighting efforts. Furthermore, Akkar has little humidity and high temperatures, which cause the spread of wildfires.

Akkar also suffers from water scarcity, a lack of local wildfire response plans within municipalities and local authorities, and insufficient firefighting infrastructure. Another key issue is the inadequacy of current legal frameworks, which lack strict policies to protect the

environment. While some laws provide general recommendations for forest management, there is no binding legal requirement for landowners to manage their forests and remove dead or flammable vegetation.

For example, Article 65 of the Forestry Law of 1949 requires landowners to submit a written statement to the forest authority at least three months before cutting trees. This statement must include the landowner's chosen location within the district. Similarly, Article 12 of the same law prohibits the cutting of state-owned forests at ground level unless there is a compelling reason, and obtaining a license in such cases requires a decree from the Council of Ministers. These provisions highlight the need for more comprehensive and enforceable laws to better address the risks of wildfires.

Akkar also faces significant challenges due to the absence of sustainable forest management, compounded by limited local resources and capabilities. For example, the "Akkar Trail" initiative comprises only 15 volunteers, reflecting the region's lack of experience and expertise in firefighting and rapid response efforts.

According to Article 108 of the Forestry Law of 1949, in the event of a forest fire, the forestry department, security personnel, and administrative authorities have the authority to mobilize all necessary personnel, transportation, and equipment to respond to the emergency. However, one of the most significant challenges in firefighting in Akkar is the presence of wild animals and dangerous species, such as beehives, which raises the risk of stings during fire rescue efforts.

In conclusion, to effectively combat wildfires, it is critical to support local initiatives such as the "Akkar Trail" and raise awareness within the local community about the importance of considering climate change and taking the necessary measures to address the climate crisis and its consequences in Lebanon.

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