

MODERN NIAGARA X COWATER  
INTERNATIONAL CASE COMPETITION

SENSING

HOPE

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**AJLOUN'S FOREST RESERVE  
COVERS 13KM<sup>2</sup>.**

**WILDFIRES CAN MOVE AS FAST AS  
22.2KM/H.**

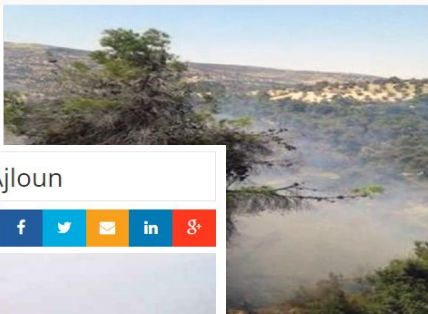
## Arson suspected in Ajloun forest fire

By JT - Jul 25, 2015 - Last updated at Jul 25, 2015

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AMMAN — A fire on Saturday erupted in a forest in the Um Al Mayadin area near Ajloun Castle for the second time within a few days and destroyed tens of perennial trees, Ajloun Agriculture Director Fayad Hawarat said.

Noting that arson is suspected in the incident, Hawarat said having potentially man-made fires in the same area shows it is a target for illegal logging purposes, the Jordan News Agency, Petra, reported.



## 450 Trees eaten up by large fire in Ajloun

Jordan Published: 2018-08-19 10:03 Last Updated: 2018-08-19 11:04



Fifteen dunums of land were eaten up by the fire. (Roya)



Hundreds of trees burned down in Ajloun on Saturday after a large fire broke out in a wooded governorate.

Firefighters from the Ajloun Civil Defense Directorate (CDD) put out the fires, which spread over an area of 15 dunums (15,000 square meters).

More than 450 trees were eaten up by the flames, Director of the Ajloun Civil Defense Directorate Colonel Hani Samadi, said on Saturday.

Colonel Samadi added that due to the location and size of the fire, his team used a firefighting airplane to beat the wildfire and prevent it from spreading any further.

The cause of the fire? Engineer Hatem Freiha of Ajloun said that the fire was caused by the incorrect

# THE JORDAN TIMES

WEATHER, AJL

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## Over 1,500 trees destroyed in Ajloun forest fire

By Hana Namrouqa - Nov 23, 2016 - Last updated at Nov 23, 2016

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AMMAN — Over 1,500 forest trees, some of which were centennial, were destroyed in a fire that erupted on Wednesday morning in Ajloun Governorate, according to the authorities.

The fire started at 7:30am and was extinguished five hours later, destroying 70 dunums of forest trees and dry grass, the Civil Defence Department (CDD) said.



## CDD: 85 Ajloun forest fires in past 3 months

Jordan Published: 2018-11-20 12:04 Last Updated: 2018-11-20 14:59



## Saving Ajloun's forests – the 'lungs' of Jordan'

April 20th, 2016

"Ever since I was a child I used to go to the forest near Ajloun," says Roqaya Al-Orood, a resident of Jordan's most wooded region. "We always went to the same picnic spot and we had many happy times." North-western Ajloun is close to Syria and the West Bank – locals refer to Jordan being surrounded by a "ring of fire" that also encompasses Iraq and Aqaba – but Ajloun's forests have always been peaceful. "Then, one day in June 2014, I arrived at my favourite spot to find the forest had been annihilated. All the trees had been burned down." These trees were several centuries old and Roqaya was appalled at the destruction. "It was very, very hard for me."

### An enduring problem

damage.

Shurman pointed out that the Directorate in coordination with the CDD are implementing measures in order to reduce risk of forest violations, in addition to increasing pumps and reservoirs to collect water to be used in case of fires.

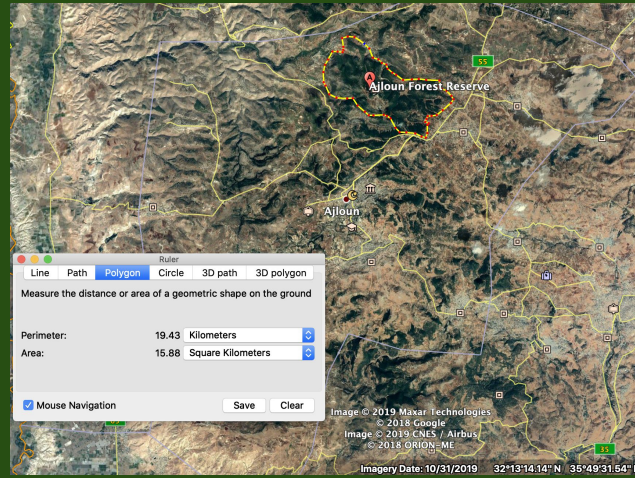
In turn, the Director of the CDD, Colonel Hani Samadi, said that the biggest challenge facing forest



st fires in past 3 months

id Ajloun Forestry Directorate said on a statement that cadres of the 'e carrying out intensive field campaigns to monitor, inspect and protect es from illegal logging, especially in winter time.

man, Director of Ajloun Agriculture told Petra News Agency on November 20, re has been 47 violations and 16 man-made fires that were dealt with in with the Directorate of Civil Defense (CDD), amounting in hundreds of tree



How can threats against the forest reserve of Ajloun be combatted through innovation, early detection, and social change?

# PROBLEM AT HAND

An aerial photograph showing a town with various buildings and a large, organized forest of small trees in the foreground. The background features rolling hills and a sky with scattered clouds.

**Jordan is the second most water scarce country in the world**

**Thousands of trees lost due to mainly man-made forest fires every year**

**Large amounts of valuable water used to douse these preventable fires**

## **LIDAR SENSOR INTEGRATED DRONES**

**DETECTING DRY SPOTS IN  
THE FOREST THAT COULD  
BE HIGHER RISK AREAS  
FOR FIRES**

**ONGOING DATA FED TO  
WATCHTOWERS AFTER  
SECTION OF AREA  
SCANNED**

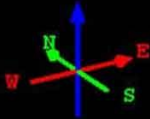
**EACH TIME DATA IS  
RETURNED, DRONE  
CHARGES VIA SOLAR  
CHARGER**



# **PROPOSED SOLUTION**



# LIDAR (Light Radar)



- Can **detect** Carbon Dioxide from smoke below the canopy that is **not visible** from the watchtowers
- Current application: **agriculture**, self driving cars



# INTEGRATING RENEWABLES

Cellulose base  
needed for gel  
can be sourced  
from  
composted  
materials



Solar drone  
charger  
on each  
Watchtower

## **BUILD**

- Design and build drone
- Create software
- Obtain gel
- Hire workers

**6 MONTHS**

## **ANALYZE**

- Understand the data
- Make decisions

**1 MONTH**

## **APPLICATION**

- Apply the gel
- Observe the results

**1 MONTH**

## **OUTREACH**

- Communicate with community
- Train workers in conservation
- Increase awareness

**ONGOING**

# **TIMELINE**

**HAND IN HAND WITH THE COMMUNITY**

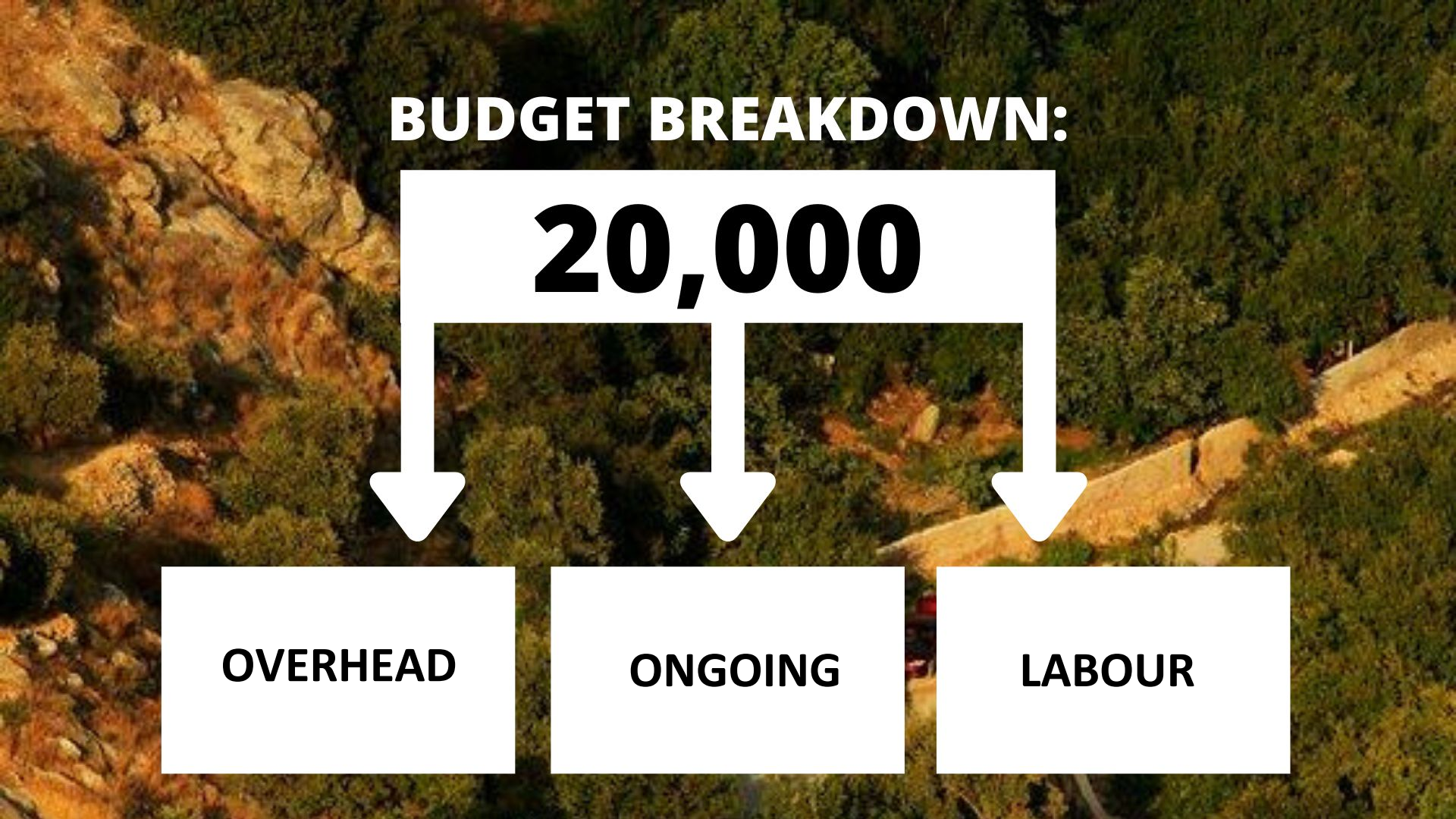
# **BUDGET BREAKDOWN:**

**20,000**

**OVERHEAD**

**ONGOING**

**LABOUR**



# SCALABILITY AND ECONOMICS

The scalability of this solution can be derived from the ratio of cost to the savings attributed to the use of the fire retardant gel:

Where: Per usage of water in the production of the gel / Per usage of water in fighting the fire

= 20000 gallons/1000 000 gallons = 2% original water usage

Price saved per application = 1,350 dollars (CAD)

# Evolving Solution to Social Issues

**Conservation and Stewardship  
Education**



**Train and hire members of the  
community, especially women**



**Bring nature to the community,  
and the community to the  
Ajloun Forest Reserve**



# JUSTIFICATION

Tree planting initiatives

Increase number of illegal logging reports

Informed ~ Passionate ~ Engaged



# HOPE ON THE HORIZON