

# Engineering Solutions for a Changing Climate

Teamwork : Abrar Al Zahrani

Scientific Research teacher: Sumayah Alfaqeh

5th High School in Taif



## An Abstract:

The ultimate aim of this research is to reach engineering solutions that can address the climate change problem, through discussing the afforestation process and measuring its impact on the rate, frequency, intensity, and timing of air temperature and humidity. The researcher conducted the study in the Globe Garden located in the schoolyard, using the experimental method. She planted Aptenia flower, as it grows and reproduces fast. The study was conducted with the experimentation approach, using two sets of variables, in order to collect data, extract information, and reach results affirming the relevant hypothesis.

One of the most fundamental findings of the study proved that there is a kind of positive correlation between water vapor rising from corps, and air temperature and relative humidity change. As known, water vapor can keep heat, which, once released, can cause a major climate shift. The findings also clarified that there is an inverse correlation between relative humidity and air temperature – relative humidity is higher in winter than in summer.

## Research Questions:

- 1-What are the influences of environmental factors on the climate change?
- 2-What is the relation between air temperature and relative humidity?
- 3-What is the impact of vegetation (afforestation process) on reducing the air temperature?
- 4-How do the crops relate to the changes in the relative humidity and temperature?

## Hypothesis :

\*Assume that cultivating varieties of plants will increase the process of transpiration which increases the water vapor in the place and thus increase the humidity and reduce the temperature

## The Plan for research

This research is considered one of the most significant studies in the area of climate change, as it contributes to developing appropriate solutions aimed at limiting the atmospheric changes, which became an international crisis at all levels. The research was designed to illustrate how important the afforestation process, referring to its critical role in supporting the ecological balance through reducing temperature and moderating humidity ratio. The study was conducted with the descriptive empirical method. The researcher planted Aptenia flower, and she measured the temperature and humidity for two months; October and November 2021, using the devices and equipment specialized in measuring the atmospheric pressure and temperature. A study protocol for temperature and a protocol for humidity were both implemented. A multitasking computer was used to collect and analyze data, and to envisage a concrete outcome represented in satisfactory results and recommendations, which can enrich the scientific

Research.



## Search badges

. Student: Abrar Hassan AL- Zahrani

The scientific research teacher: sumayah Alfaqeh

Globe's teacher :Amal AL- Amriti

Teachers of English language Mahmoud Darwish, a department of business and computer science from MIT University translate the research in to English language. Teacher of maths Samira AL-Maliki in analysis of data and work of statistical tables . Teacher of Arabic language Wahiba AL-Afghani in the search format and teacher of biology / Amna Al-Towerki in giving information about plants

## Globe data:

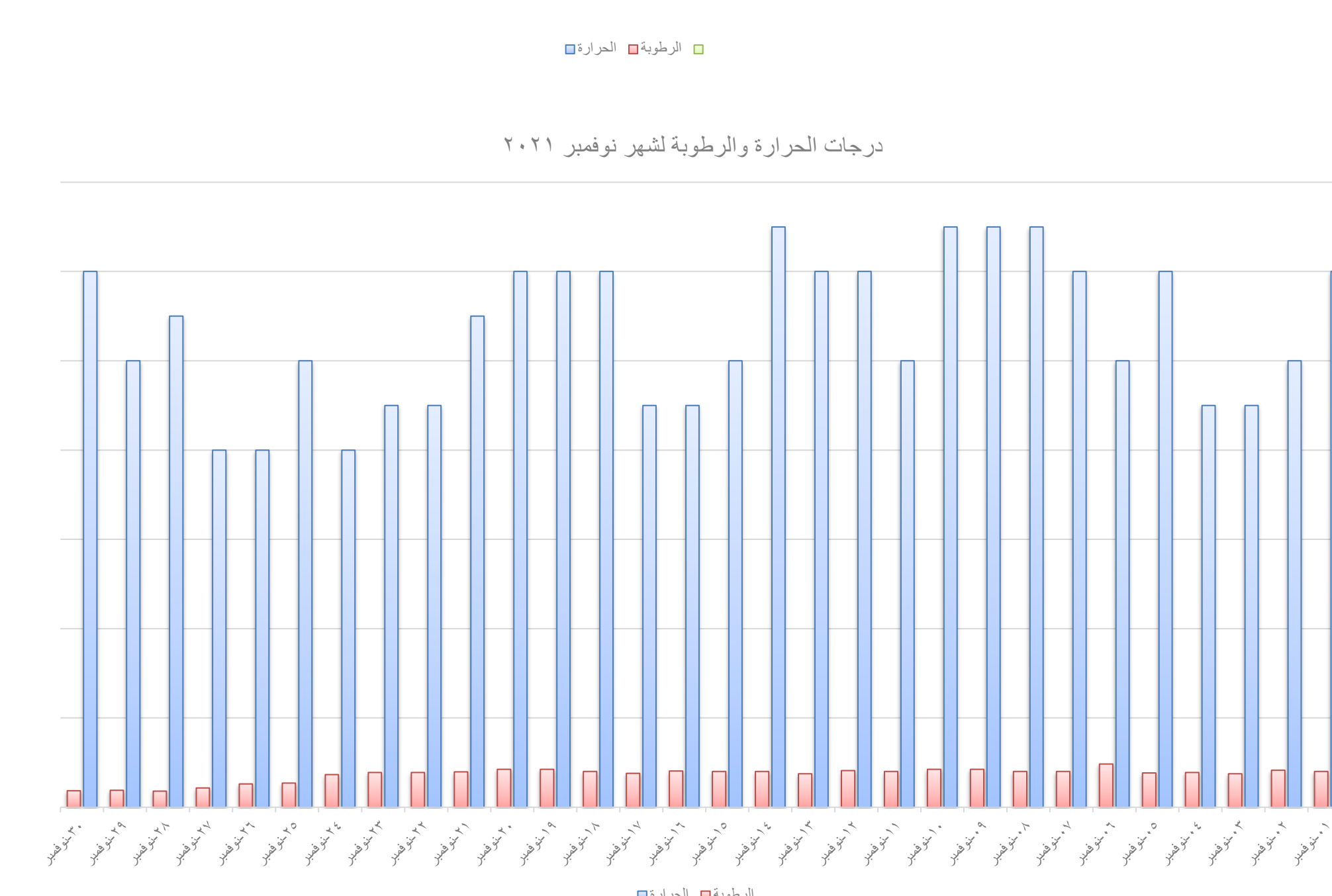
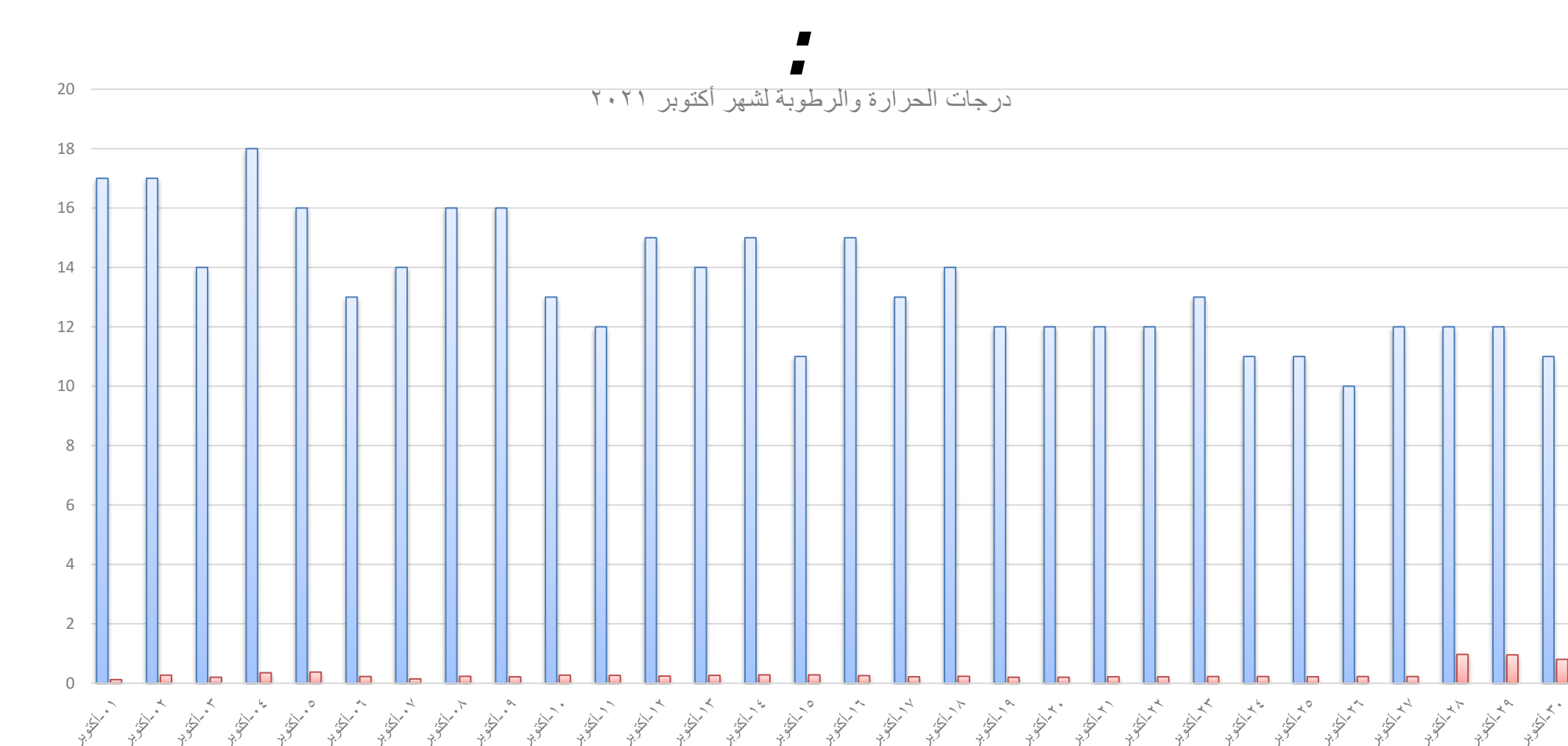
Daily temperature and humidity are introduced during the month of October, November of the fifth high school in Taif

The instruments related to atmospheric research were used. The temperature protocol, the humidity protocol and the use of the computer were used for analysis

Data



## data analysis:



## Summary of the data:

It turns out that the cultivation of plants generate moisture and reduce the temperature of the atmosphere and thus work to modify the temperature of the place (Garden Globe)

Suppose that planting plant E

Suppose that the relative humidity symbol ew

Suppose that temperature symbol T

E α ew

ew α 1 / T

## Conclusions:

Afforestation process helps to smooth the atmosphere and lower temperatures, which helps balance the climate

It was concluded that

Water vapor retains heat and when released it causes air changes

Relative humidity increases during the winter and decreases during the summer and it was concluded that there is an inverse relationship between water vapor and relative humidity

## recommendations,

- 1- Reiterating the importance of deploying an increased number of individuals working in agriculture in form consistent with the geographical area of each region. Those individuals should also receive additional support represented in guiding and mentoring them so that they become aware of the benefits of afforestation process and its impacts on climate change.
- 2-Knowing the planting dates and cropping schedule appropriate for growing and cultivating the plant species consistent with the current climatic conditions of the study area.
- 3- Assisting in setting up nature reserves, which can provide great opportunities for the survival and diversity of several genotypes so as to achieve a type of climatic balance in the near future.
- 4-Reducing harmful traditional practices including unfair pruning (trimming trees), besides promoting a science-based approach for sustainable agriculture that ensures maintaining the proper bases and guidelines relating to afforestation within the cities and plant distribution at each sampled location.
- 5- Encouraging the cultivation of native species and neophyte plants that can withstand the domestic environmental conditions.

## References:

- <https://platform.almanhal.com/GoogleScholar/Details/?ID=2-62969>
- <https://web.b.ebscohost.com/abstract?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=18130526&asa=Y&AN=91736311&h=yFxslo6ceV7UtEsd6WRLj9H%2bdTBa9OKIAVWkOOrG2NMZJoD5q6xOaAYbjL5Mhv3gihutqDUHCulQDprAQ4g%3d%3d&url=c&resultNs=AdminWebAuth&resultLocal=ErrCrlNotAuth&crlhashurl=login.aspx%3fdirect%3dtrue%26profile%3dehost%26scope%3dsite%26authtype%3dcrawler%26jnl%3d18130526%26asa%3dY%26AN%3d91736311>
- <https://www.iasj.net/iasj?func=article&ald=45211>
- <https://www.iasj.net/iasj/article/10527>
- [https://studieshistoricalandgeographical.blogspot.com/2010/01/blog-post\\_2107.html](https://studieshistoricalandgeographical.blogspot.com/2010/01/blog-post_2107.html)