NLP for Environmental Citizen-Generated Data

to Study Climate Change Risk and Design Adaptation Techniques in Agricultural Areas, Grape Cultivation as a Case Study

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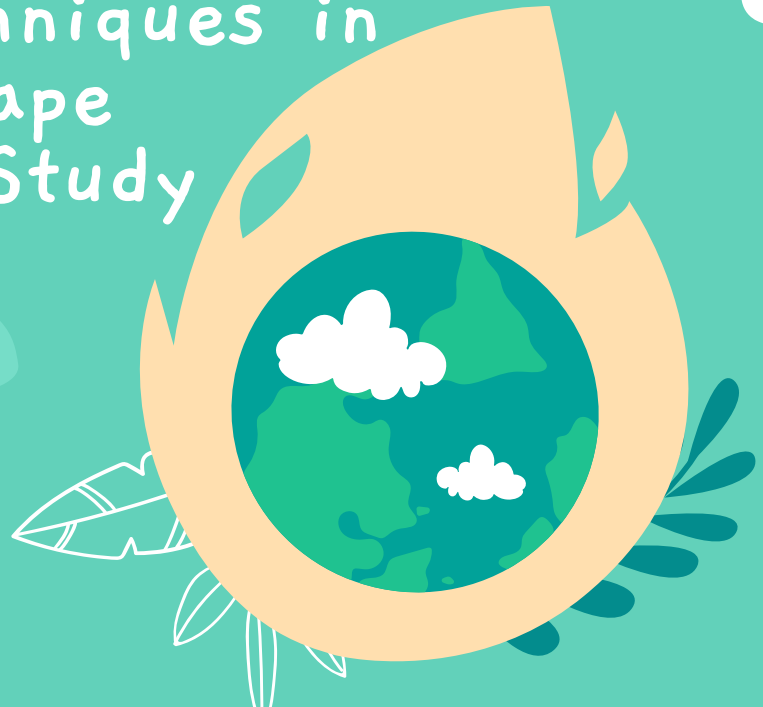


Who I am?

- Started with youth empowerment, and community organisation
- Moved to social justice and peacebuilding, SDG
- Working on hardware security
- Recently, building passion towards the intersection of

  These fields.

What are we examining today?

Main points discussed in this presentation

Why engaging public? Motivators and Benefits

Why there is a need to initiate citizen science projects in our local context

How were we able to achieve public engagement?

In the context of citizen science

Why and how machine learning could help?

In Algeria, why engaging public in studying climate change?

- One of the most vulnerable countries in the world to the impacts of climate change is Algeria
- knowledge of environmental and climate issues is lower than in other parts of the world
- Governments lack a mandate from society to take transformative action
- while citizens do not have access to information allowing them

to make informed decisions and advocate for decision

makers to take action.

Köppen-Geiger climate classification map for Algeria (1980-2016)

Source: Beck et al.: Present and future Köppen-Geiger climate classification maps at 1-km resolution. Scientific Data 5:180214, doi:10.1038/sdata.2018.214 (2018)

Convincing public to engage in climate change analysis:

Climate Security

Non climate friendly agriculture methods, contribute to escalation of CC

Leading Participatory Action Research

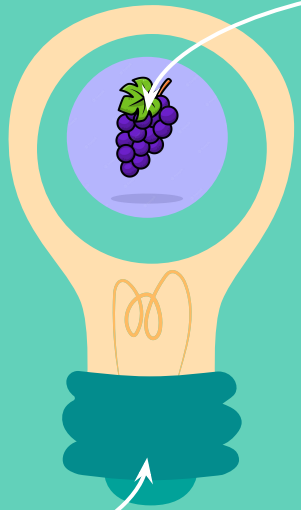
Agriculture

Economic benefits are affected by climate issues

Unclarity about current situation, needed proper and strategic intervention

Community based PAR

- Study root causes of current issues
- Examine current understanding, study possible solutions



Ambiguity about current situation

- Lack of theoretical evidence about issues
- Absence of policies

Questions we started with included:

Analysis that lead to ADAPTATION

- What specific climate change-related challenges are farmers currently facing in terms of crop production?
- What types of agricultural practices or policies could be implemented to help farmers in adapt to the effects of climate change on their crops

PAR methodology

Focus Groups

- facilitated series of discussions which involved 6 participants. The discussions were centered around emerging problems related to grape cultivation in the region

Interviews

- we run one-on-one conversations with farmers.
- gather in-depth information about the experiences

Grape cultivation at this region suffered different issues with various consequences:

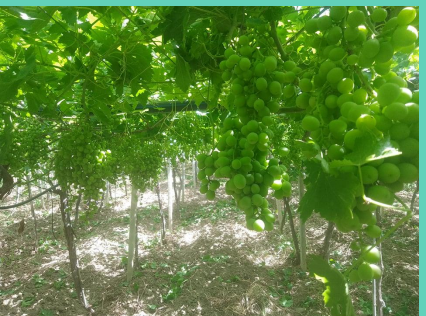
Sudden temperature variations

The high cost of energy

absence of supportive infrastructure, and adaptation policies

Water Scarcity, droughts, heatwaves, and wildfires

Absence of efficient irrigation systems



Key Findings and generated Insights

Results of PAR

- Common observation of climate change over time
- a shift in the duration and intensity of droughts
- greater winds associated with warming
- Local power and water management system to adapt

Why there is a need for integrating NLP

01

Difficulty of Analysis

Performing extracting theoretical evidence is not open to anyone, hence automating this process would help many to join the movement of analysing climate issues

Benefits

02

Time consuming task

03

Variety

Of study cases

WHERE ARE WE STANDING

01

NLP is for:

extracting information from unstructured data sources such as social media, scientific literature, and environmental documents,

02

We use it for

Extracting insights from qualitative data

03

In Climate

Analysis of qualitative data generated by community

Tasks performed includes:

Preprocessing

Sentiment Analysis

Topic modeling

Theoretical Evidence Extraction

Model

Automated analysis

Handy useful UI

Obstacles faced and challenging problems

Challenges

Lack of data
people involvement approach provide limited data

Costs
Organising analysis session is costly

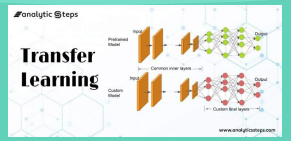
Lack of literature
Similar projects would have helped gaining insights

Future steps and adjustments to be made:

More engagement

Specific DL NLP

Transfer Learning



METHODOLOGY

Funding

Venus is the second planet from the Sun

User friendly stuffs

AppInevntor

Thank You!

Any Questions?