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Assessing of ESA CCI Rainfed Cropland Data Using MODIS NDVI and Soil Moisture in Morocco from 2000 to 2022

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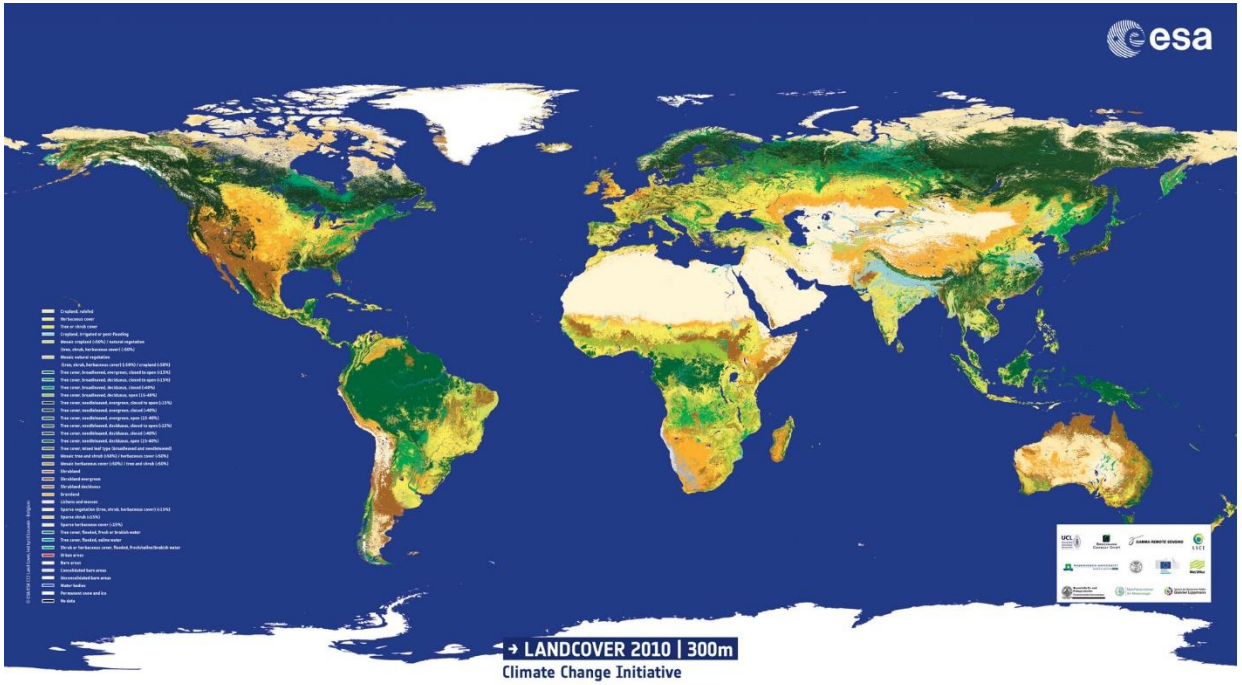
Motivation and Goal

- **Land Cover Maps**: Essential for environmental studies.
- **ESA CCI Data**: 1992–2015, global, 300m resolution, accuracy 75%.
- **Key Point**: Separates rainfed and irrigated croplands.
  - For better water management insights; helping assess climate vulnerability such as drought in agriculture.
- **Focus**: Rainfed cropland changes in Morocco (2000–2022).



Outline

1. Data and Method

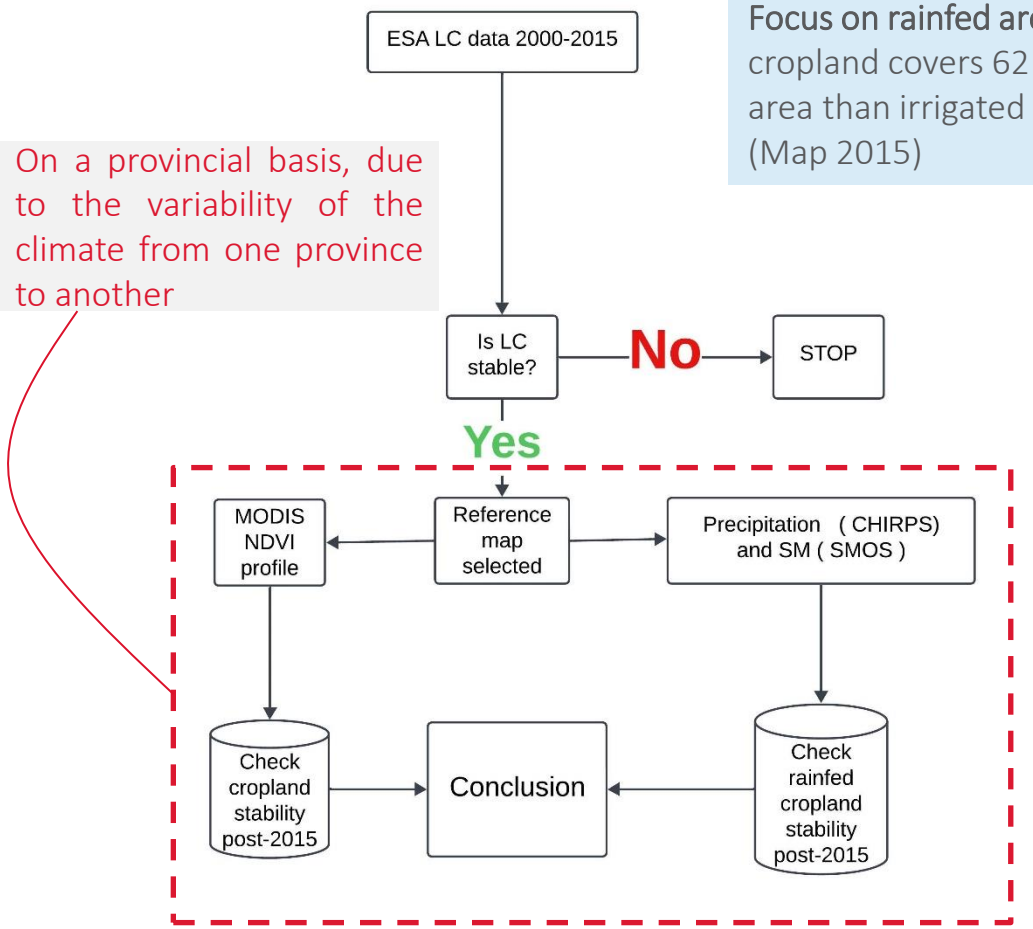
2. Results

3. Conclusion

1. Data and Methods

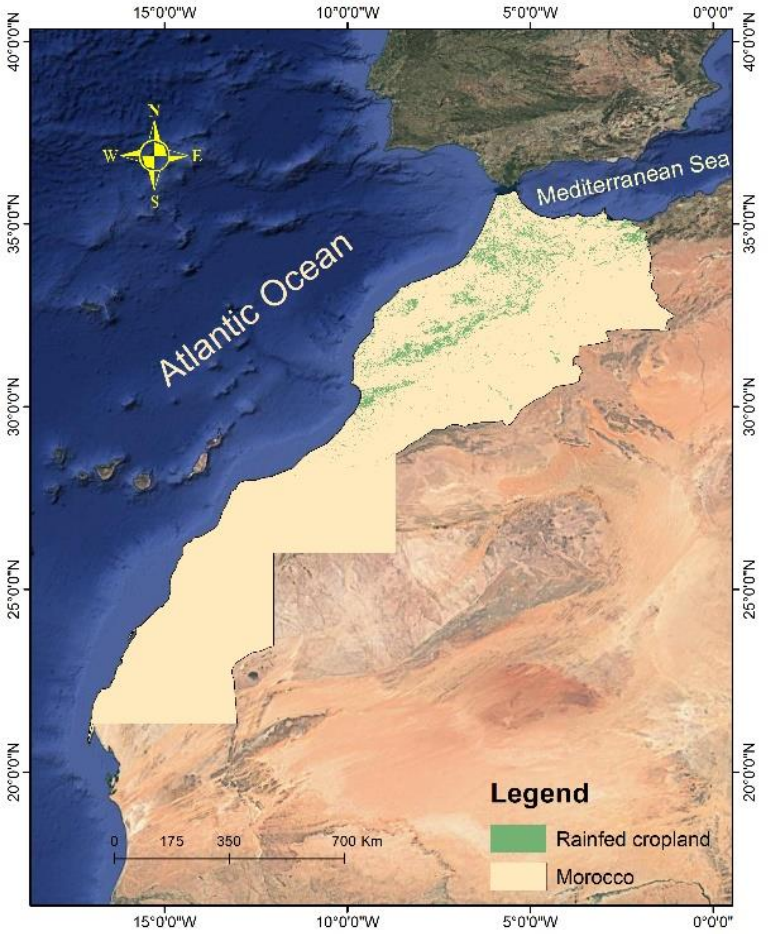
Methodology

On a provincial basis, due to the variability of the climate from one province to another



Focus on rainfed areas: rainfed cropland covers 62 times more area than irrigated cropland (Map 2015)

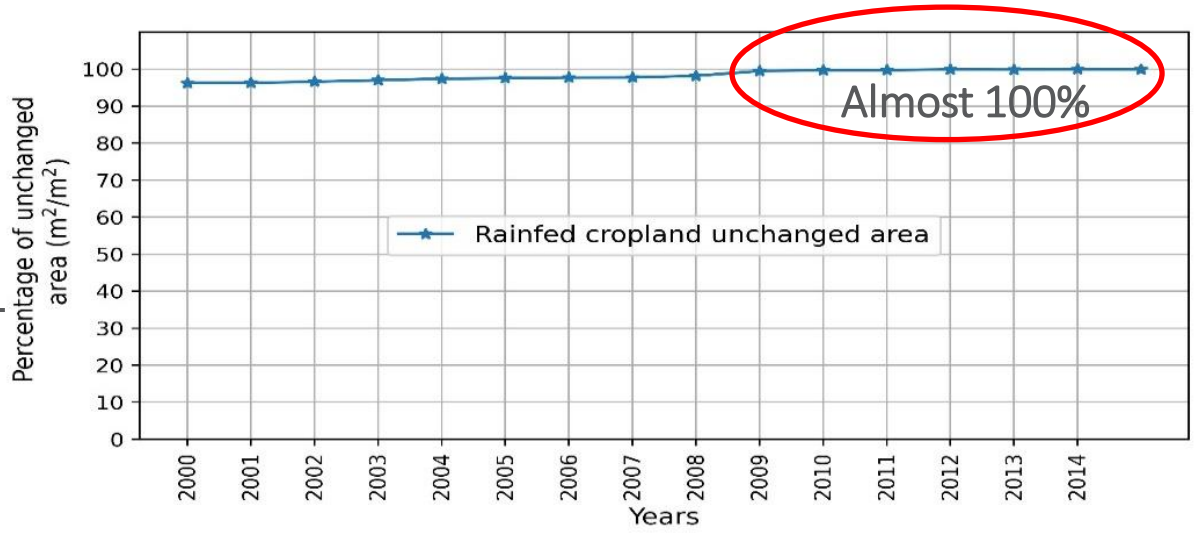
Study area



2. Results

Analysis of Unchanging Rainfed Cropland Areas (2000-2015)

- **Land Cover Stability**: No significant change was observed from 2000 to 2015.
- **Representative Map**: The 2015 map effectively represents this stable period.



The mask rainfed cropland area divided by the 2015 rainfed cropland area for each year

2. Results

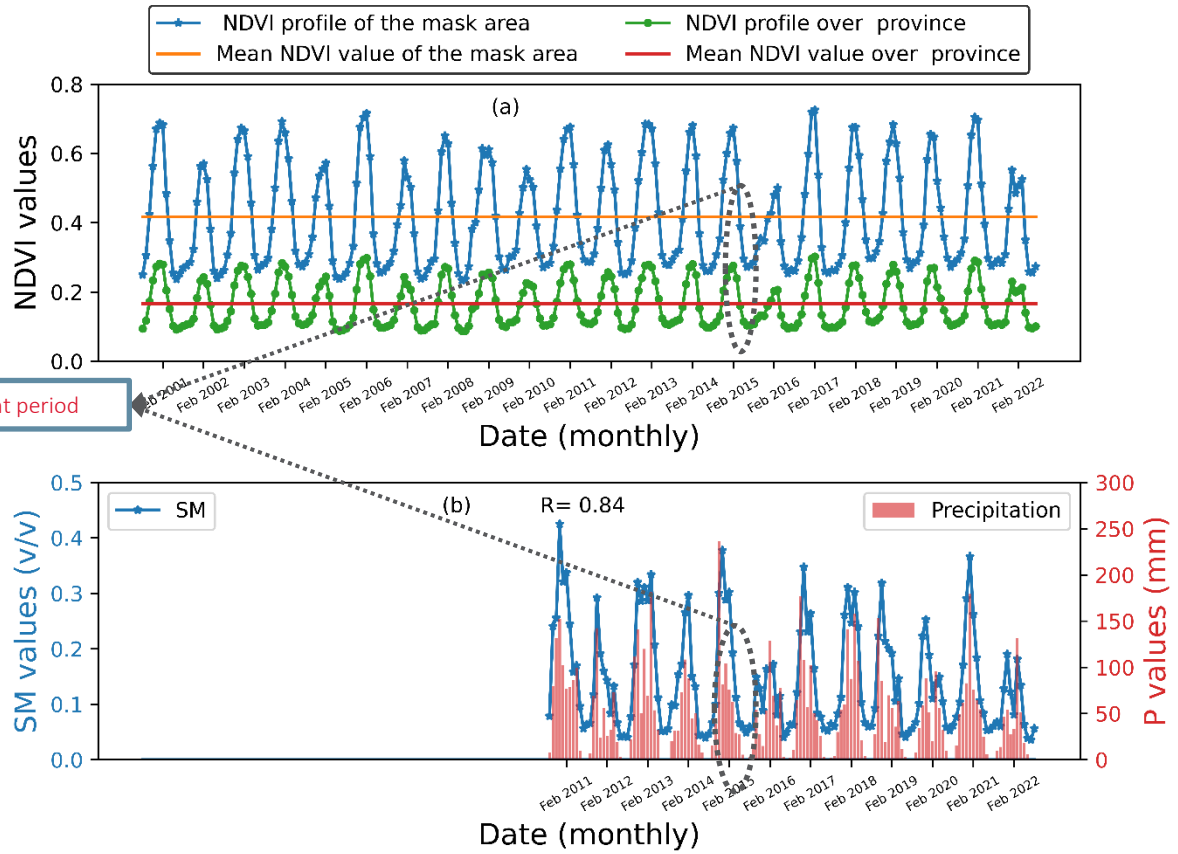
Analysis of Unchanging Rainfed Cropland Areas (2000-2022)

These areas remain cropland (Cereals) post-2015 based on the NDVI profile

The stable, seasonally recurring NDVI pattern indicates consistent vegetation growth, typical of managed cropland (Cereals), maintained from 2000 to 2022. (maxNDVI in March or April)

These areas remain rainfed post-2015

The high correlation between soil moisture and rainfall (R = 0.84) shows dependence on natural precipitation, confirming that these areas are rainfed.



3.Conclusions

- This study aimed to assess the stability of rainfed cropland areas in Morocco from 2000 to 2022.
- Results show that rainfed croplands remained largely stable over the study period, especially from 2000–2015.
  - Using MODIS NDVI, soil moisture (SM), and precipitation data.
  - Enabled identification of stable cropland areas and confirmed continuity in land cover after 2015.
- This study helps to better understand land cover dynamics, supporting sustainable agriculture, and effective resource management in Morocco.
- The 2015 map is recommended as a reliable reference for recent land cover status in Morocco.

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Thank you!

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ACCWA

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