UN-SPIDER

Workflow

Meeting details: EvIDENz 2\textsuperscript{nd} User Workshop
Part A: Data acquisition and preparation

Part B: Install R and R-Studio; EVI phenology and VCI computation.

Part C: Integration of Land use, drought impact, yield statistics, and prices.

Part D: Maize production losses estimation
Data Acquisition

MOD13Q1 V006 Data EVI
MOD13Q1 V006 Data Pixel Reliability
Cloud Masking

A. USGS appEEARS platform for data preparation and download.

B. MOD13Q1 16-day EVI and Pixel Reliability
   - Cloud quality masking
   - Chunk-wise processing calculation of VCI from EVI
   - Seasonality calculation from EVI
   - VCI
   - Seasonality Parameters
   - Weighted linear combination
   - Classified drought index

C. Agricultural drought impact map (H2015_250m)
   - Land use data (LC2015)
   - Administrative area Kiev (admZUKR)
   - Price of crop
   - Yield statistics range 2004-2015

D. Area of crop affected
   - Expected harvest hectare (ha_{H0} + ha_{H1} + ha_{H2})
   - Actual harvested hectare (ha_{H0} + ha_{H1})
   - Damaged harvested hectare (ha_{H1})
   - Δ Hectare (destroyed) (ha_{H2})

   - Δ Yield
   - Yield_{2015}
   - Yield Average

   - Final output: Crop production losses value in US Dollars (C_{2C1}, C_{2C2})
   - HectareDamaged " ΔYield " Price (C_{2C1})
   - Δ HectareDestroyed " YieldAverage " Price (C_{2C2})
Phenology / Seasonality [Matthias Forkel]

Vegetation Condition Index [Kogan]

\[ VCI_j = \left( \frac{EVI_j - EVI_{\text{min}}}{EVI_{\text{max}} - EVI_{\text{min}}} \right) \times 100\% \]

SOS: start of season
EOS: end of season
LOS: length of season
POP: position of peak value
POT: position of trough value
MGS: mean growth season value
PEAK: peak value

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Agricultural drought impact map (H2015_250m)
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Price of crop
Yield statistics range 2004-2015

D
Area of crop affected
Expected harvest hectare (ha_{H0} + \Delta ha_{H1} + \Delta ha_{H2})
Actual harvested hectare (ha_{H0} + \Delta ha_{H1})
Damaged harvested hectare (\Delta ha_{H1})
\Delta Yield
Yield_{2015}
Yield Average
Final output: Crop production losses value in US Dollars (C_{2C1}, C_{2C2})
Data reading into R and preparation:
projection, re-sampling ...
Damaged & Destroyed maize hectares

Yield statistics (2015) & yield avg

Maize price (2015)
Expected harvest hectare = $ha_{H0} + ha_{H1} + ha_{H2}$

Actual harvest hectare = $ha_{H0} + ha_{H1}$

Damaged un-harvested hectare = Expected – Actual harvest $ha_{H2} = \Delta$ Hectare
\[ C_{2c1} = \text{Hectare damaged} (h_{a_{H1}}) \times \Delta \text{yield} \times \text{Price} \]

\[ C_{2c1} \text{ in USD} \]

\[ C_{2c2} = \Delta \text{Hectare destroyed} \ (h_{a_{H2}}) \times \text{Yield average} \times \text{Price} \]

\[ C_{2c2} \text{ in USD} \]
Direct crop loss estimate (maize)

\[ C_{2c} = C_{2c1} + C_{2c2} \]

**C2c in USD**

**Note:** Prices do not reflect the actual losses as yield information is simulated.
Thank you