Agricultural Production Systems sIMulator (APSIM)

APSIMx is a global, farming systems tool that simulates rangeland, livestock and crop production given weather data, soil attributes and a management policy. APSIMx couples APSIM and G-Range models.

* Model ID: APSIM
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* Model Category: Agriculture

# Outputs

**area:**

* Description: Total area sown for the given crop and season
* Units: ha

**production:**

* Description: Total production for the given crop and season
* Units: quintal

**yield:**

* Description: Mean yield for the given crop and season
* Units: quintal/ha

**production\_anomaly:**

* Description: Relative difference in production between intervention and baseline scenario for given crop and season
* Units: percentage

**yield\_anomaly:**

* Description: Relative difference in yield between intervention and baseline scenario for given crop and season
* Units: percentage

# Parameters

**crop:**

* Description: select the crop to model
* Type: ChoiceParameter
* Choices: maize, wheat, teff, sorghum, barley
* Default: teff

**season:**

* Description: select the season to model
* Type: ChoiceParameter
* Choices: belg, meher
* Default: meher

**climate\_anomalies:**

* Description: One of 5 classes based on the mean 2018-19 cropping-year (March-February) rainfall and temperature anomalies in the climate ensemble member. Ensemble members where the root-mean-square anomaly of temperature and precipitation are within 0.9 standard deviations are "midrange"; otherwise ensemble members are classified according to the quadrant in which they fall. Null for historical runs.
* Type: ChoiceParameter
* Choices: warm,wet, midrange, warm,dry, cool,wet, cool,dry
* Default: midrange

**cereal\_prodn\_pctile:**

* Description: Ranking of total national production of the 5 cereals as modelled under 2018 land use and practices, expressed as a percentile (the zero percentile is lowest). Null for historical runs.
* Type: NumberParameter
* Min/Max: 0, 1
* Default: 0.5

**cereal\_prodn\_tercile:**

* Description: Grouping of climate ensemble members according to terciles of total national production of the 5 cereals as modelled under 2018 land use and practices. Null for historical runs.
* Type: ChoiceParameter
* Choices: Low tercile, Middle tercile, High tercile
* Default: Middle tercile

**irrigation:**

* Description: Average proportion of cereal area that is irrigated across Ethiopia. Local proportions vary spatially and with the type of crop
* Type: NumberParameter
* Min/Max: 0.006, 0.08
* Default: 0.0

**additional\_extension:**

* Description: For this scenario, an "extension package" means the adoption of both improved crop cultivars and chemical fertilizer application. The value is the proportion of land \*\*not already using "extension package"\*\* that is converted to management under the "extension package". For example, if 20% of maize crops in a grid-cell already use improved cultivars plus fertilizer, then 40% "additional extension package" will increase the overall level to (20% + 40% x (100%-20%)) = 52%
* Type: NumberParameter
* Min/Max: 0, 0.4
* Default: 0.0

**temperature:**

* Description: Change applied to maximum and minimum air temperature in every day of the climate record in the counterfactual
* Type: NumberParameter
* Min/Max: 0, 1.5
* Default: 0.0

**sowing\_window\_shift:**

* Description: Shift (measured in days) in the date range over which crops are sown in response to a sufficiently large rainfall event
* Type: NumberParameter
* Min/Max: -30, 30
* Default: 0

**fertilizer:**

* Description: Additional N fertilizer applied at sowing, over and above the rate that is specific to a location, crop and management system
* Type: NumberParameter
* Min/Max: 0, 100
* Default: 0

**rainfall:**

* Description: Multiplier applied to daily rainfall in every day of the climate record in the counterfactual
* Type: NumberParameter
* Min/Max: 0, 1.5
* Default: 0.0