Targeting Tools version 1.0

CIAT
International Center for Tropical Agriculture
Since 1967 *Science to cultivate change*

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Background

- Site-specific crop management is the fundamental basis for sustainable intensification of crop and livestock production.

Image credit: [Neil Palmer]

Heterogeneity of agricultural systems

- Bio-physical

- Socio-economic

- Influences suitability and adoption of interventions

- Also influences impacts -when adopted and out-scaled

What you need to know

- Runs on Python

  - Targeting toolbox is an ArcGIS toolbox (.pyt) purely developed using Python programming language, ArcPy library.

- Toolbox tools

  - It is made of three tools; *Land Suitability, Land Similarity* and *Land Statistics* tool.

- Land Suitability Tool

  - Matches suitability criteria with a spatial database. *Suitability maps*: areas where a specikc strategy is likely to have a positive impact.

- Land Similarity Tool

  - Estimates the potential for out-scaling using socio-ecological characterization and similarity analysis. *Similarity maps*: indicating the wider applicability of the intervention.

- Land Statistics Tool

  - Calculates zonal statistics, e.g. total area/mean covered by human and/or livestock population....., *Output table*: Statistics per suitability/similarity class.

Get Tools

- Depending on your needs and requirements you can use the tools in these platforms.

Web Application
Browser

- ✔ Runs all geoprocessing tools from any modern web browser such as Chrome, Internet Explorer, and FireFox.
- ✔ Pre-processed input data for easy and fast task execution.
- ✔ Upload user data to be used as an input data for the tools.
- ✔ Download outputs from within the interface.
- ✔ Sends outputs through e-mail.

Get Started

Python Toolbox
ArcGIS Desktop

- ✔ Runs all geoprocessing tools from Esri ArcGIS Desktop.
- ✔ Requires user data as an input data for the tools.
- ✔ Does not require internet.
- ✔ Requires Spatial Analyst Extension to be enabled.
- ✔ Requires R to be installed.
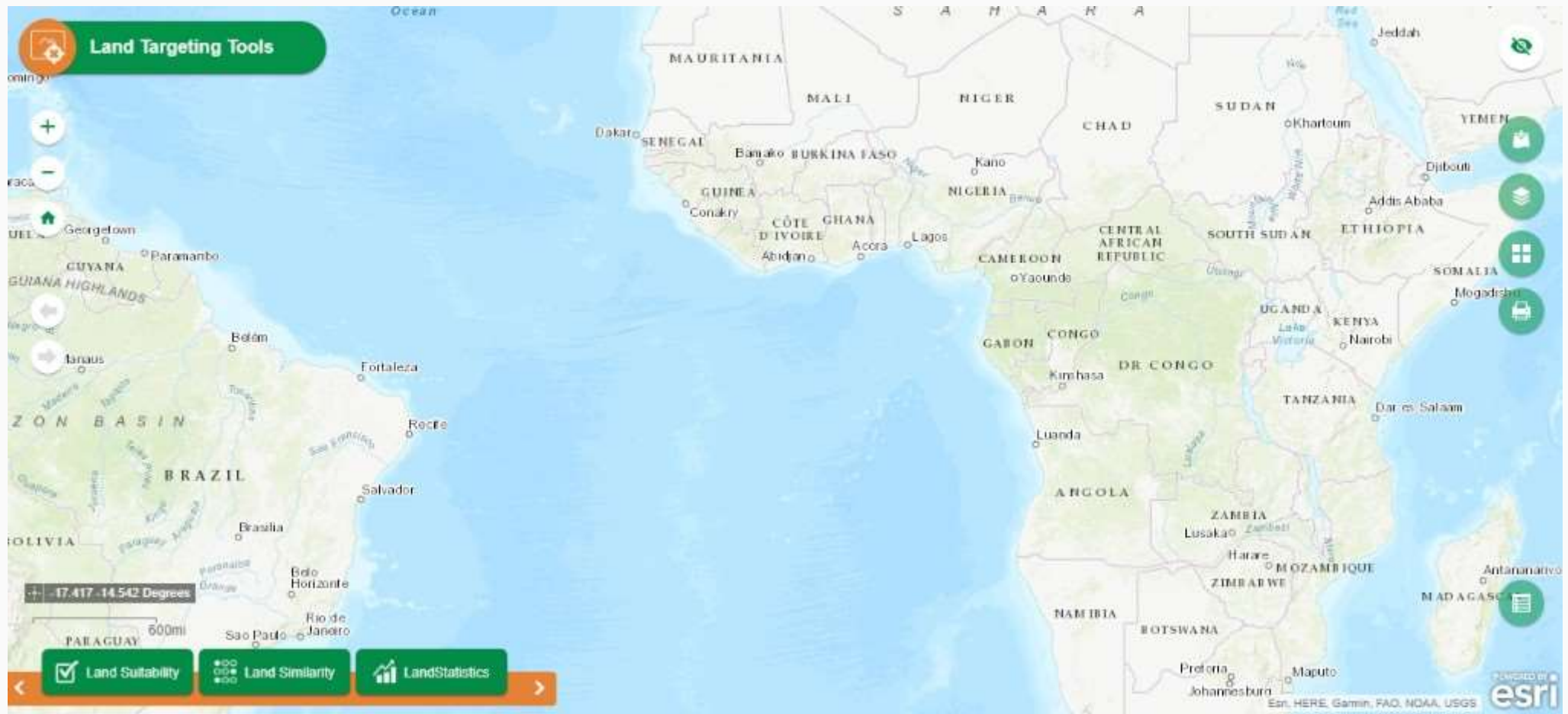- ✔ Requires Esri ArcGIS 10.3 Desktop and above.

Download

Geoprocessing Services
ArcGIS Server

- ✔ Designed for other applications to consume the services.
- ✔ Currently serving Land Targeting Tools Web Application.
- ✔ Built using ArcGIS for Server 10.5.
- ✔ Requires internet to use the services.
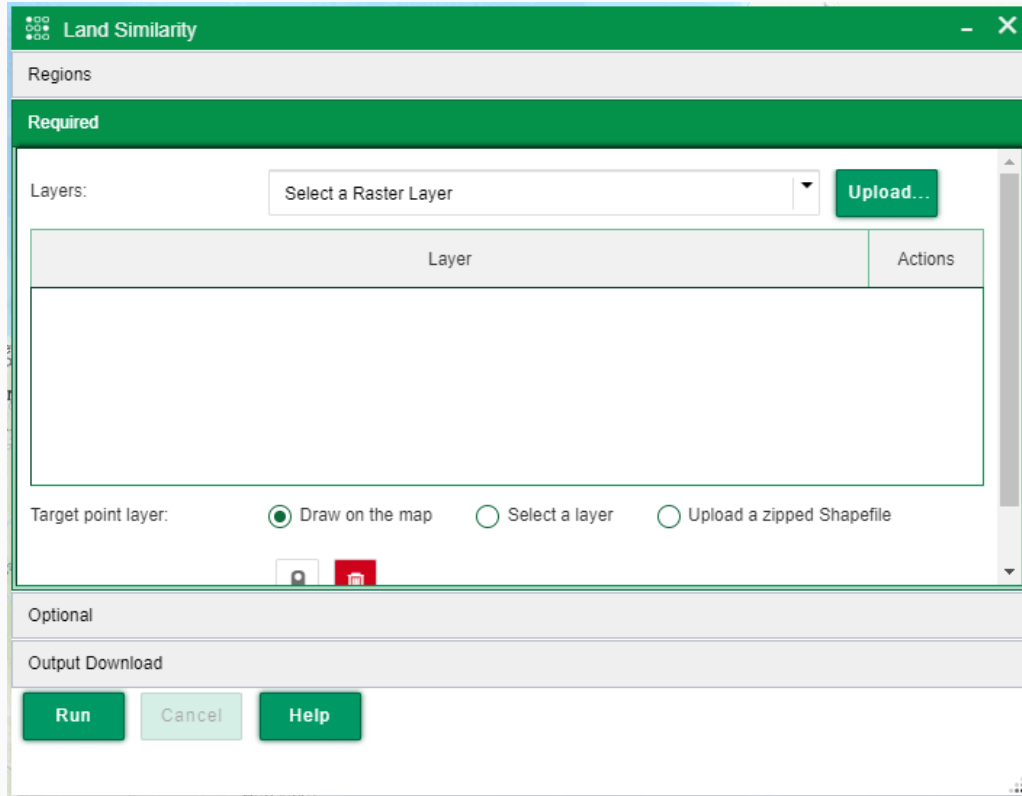- ✔ Recommended for developers.

Get Started

Web interface https://targetingtools.ciat.cgiar.org/

Land suitability

- Combining suitability maps

- For binary output:
    - min value = optimal from
    - optimal to = max value

- For gradient:
    - min value < optimal from
    - optimal to > max value

Land similarity

Compares different geographical layers

- Assesses to what extent each pixel is similar to a reference point ~ distance.

Two methods:

- Mahalanobis similarity: assess the distance by measuring how many standard deviations away a given value is away from the reference point.

- Multivariate Environmental Similarity Surfaces (MESS): uses an index that compares the value of a point in space with the distribution of the reference points.

Land statistics

- How big is the suitable area?

- How many people live in it?

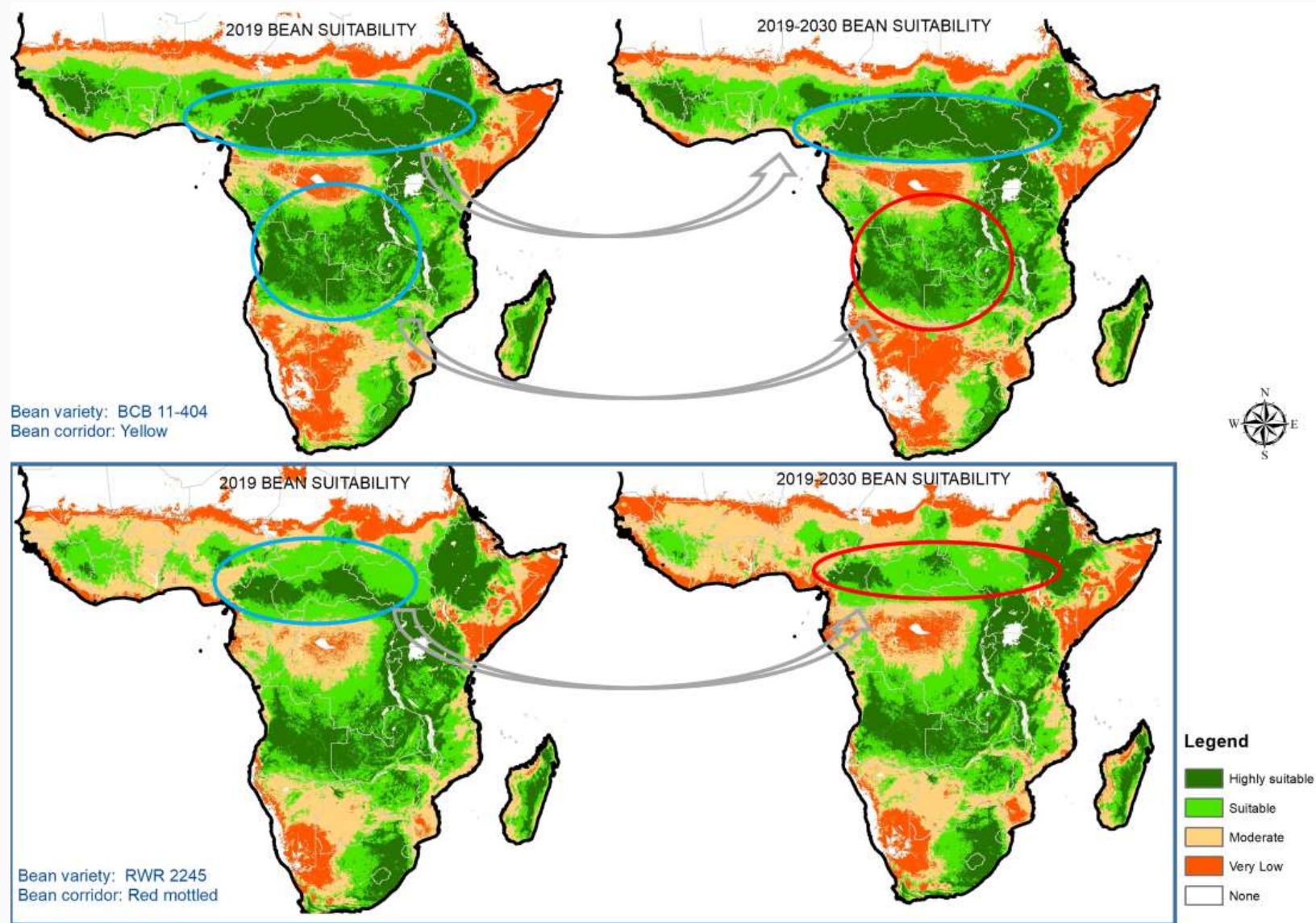- What is the average cattle density?

System availability
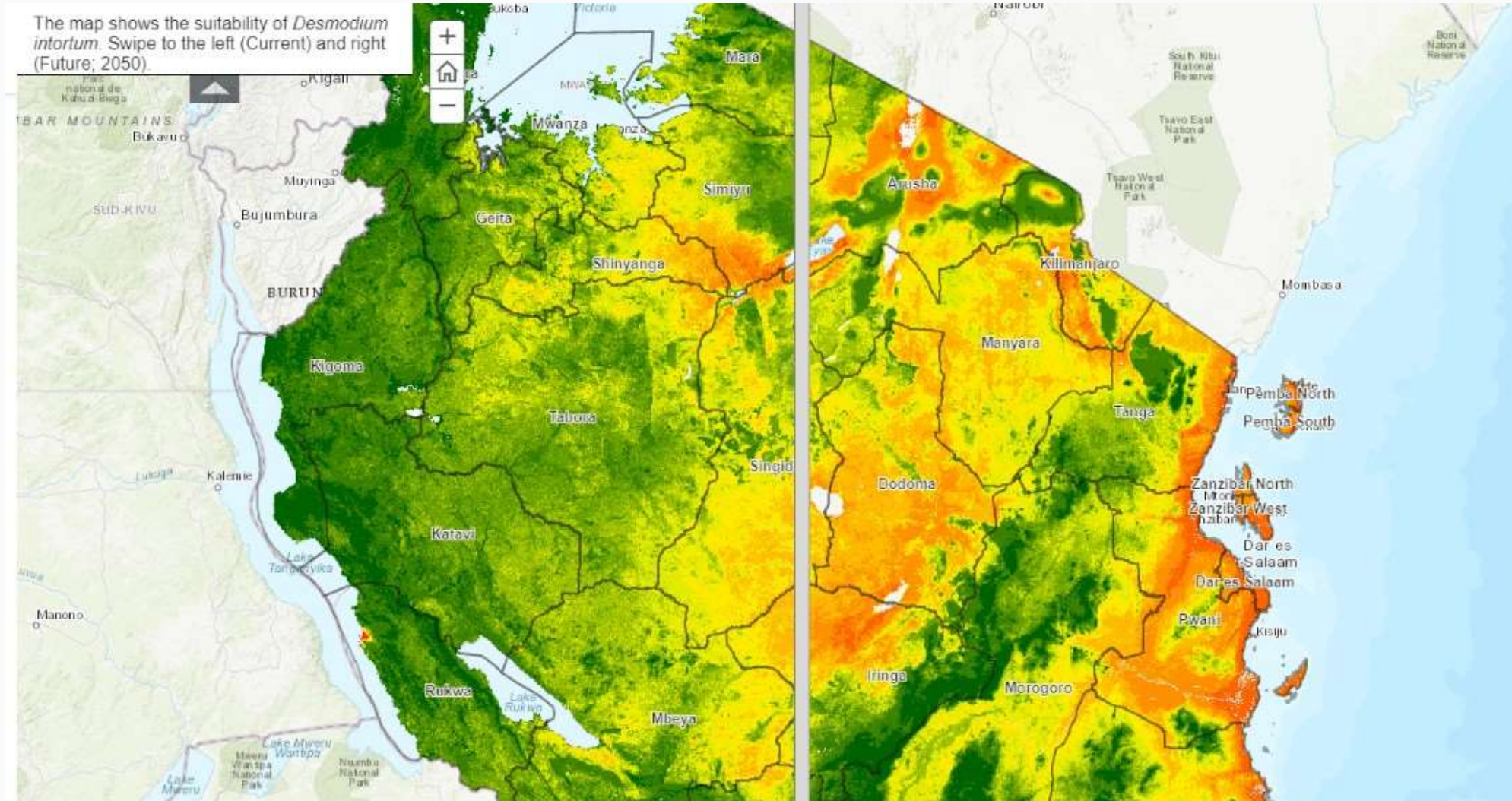
- Global;

- Countries.

Use cases

- The tool is ideal for the use by:
  - Students;
  - Educators;
  - Development practitioners.

Bean suitability in Africa

Suitability of Forages in Tanzania

The map shows the suitability of *Desmodium intortum*. Swipe to the left (Current) and right (Future; 2050).

How can you contribute

- Report use cases https:/ targetingtools.ciat.cgiar.org/

- File issues/ report a bug via GitHub

- Feature request

Thank you!

CIAT

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