Appendix 5. SELS Diagnostic Plots

In this section we provide a graphical characterization of the SELS by displaying (in one page per SELS):

A. **Variables boxplots** showing the quartiles summary (boxes) and individual values (dots) of hexagons within the SELS for the 24 quantitative input variables. Box limits represent 2nd and 3rd quartiles, vertical lines the 1st and 4th quartiles, and the thicker line in the middle of the boxes indicates the median value.

B. **SELS distribution map** with the location of the hexagons classified within that SELS (black), the continent as a background (grey) and the national political boundaries (white).

C. **Relative information plot** or variable's "contribution" to the model based on the results of the boosted regression trees analyses. In this section the models consist in distinguishing one particular SELS from the rest as a whole.

D. **Partial dependence plots** of the eight most informative variables for defining the SELS. These plots are a product of the boosted regression trees, and show the distribution of the fitted function (y axis) along the variables' values (x axis) informing on the marginal effect of the variable when you move along its value range (while holding everything else constant). Interpretation: for y-values larger than zero indicate that the SELS category is present in this value range, for y-values smaller than zero that it is absent in this value range. The larger the deviation from zero, the higher the probability of presence (positive values) or absence (negative values).
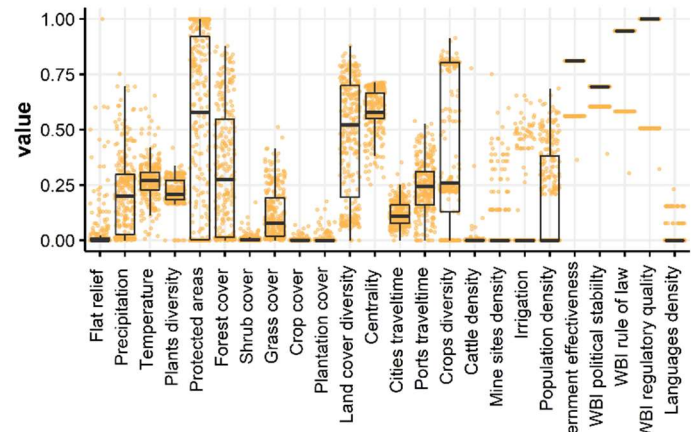
SER	A. Sparsely Populated Southern Cold Lands
SELS	**A1. Sparsely populated cold extra-tropical Andes**

A. Variables boxplots

value

Flat relief, Precipitation, Temperature, Plants diversity, Protected areas, Forest cover, Shrub cover, Grass cover, Crop cover, Plantation cover, Land cover diversity, Centrality, Cities traveltime, Ports traveltime, Crops diversity, Cattle density, Mine sites density, Irrigation, Population density, WBI government effectiveness, WBI political stability, WBI rule of law, WBI regulatory quality, Languages density

B. SELS distribution map

C. Relative information plot

Temperature
WBI regulatory quality
Plants diversity
Precipitation
Population density
Irrigation
Ports traveltime
Centrality
Protected areas
Plantation cover
Forest cover
Grass cover
Cities traveltime
Anthropization century
Cattle density
Crops diversity
Urbanization type
Land cover diversity
Mine sites density
Shrub cover
Flat relief
WBI rule of law
WBI political stability
WBI government effectiveness
Languages density
Crop cover

Dimension
- Biological
- Cultural
- Demographic
- Economic
- Landcover
- Physical
- Political

Relative information (%)

D. Partial dependence plots

Temperature · WBI regulatory quality · Plants diversity · Precipitation

Population density · Irrigation · Ports traveltime · Centrality

Marginal effect

Variable values

2

A. Sparsely Populated Southern Cold Lands

A2. Remote Cold Ecotonal extra-ropical Andes

SER

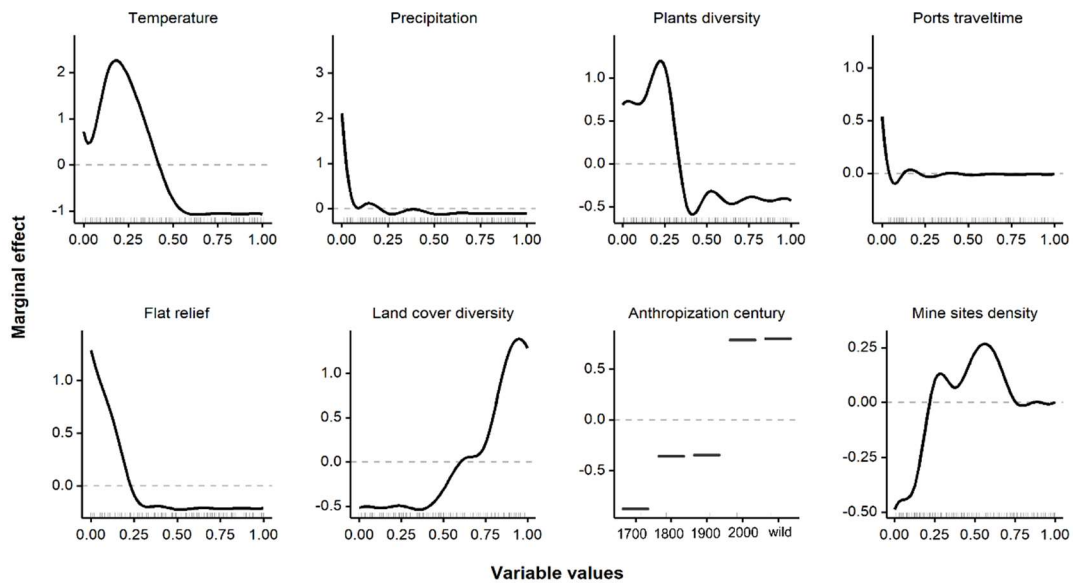SELS

A. Variables boxplots

B. SELS distribution map

C. Relative information plot
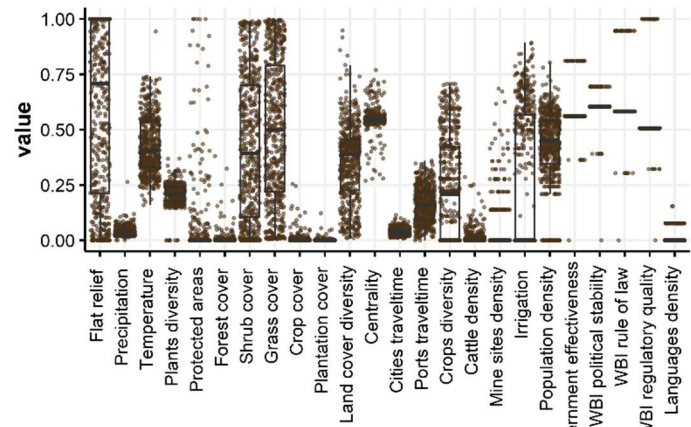
D. Partial dependence plots

3

SER

A. Sparsely Populated Southern Cold Lands

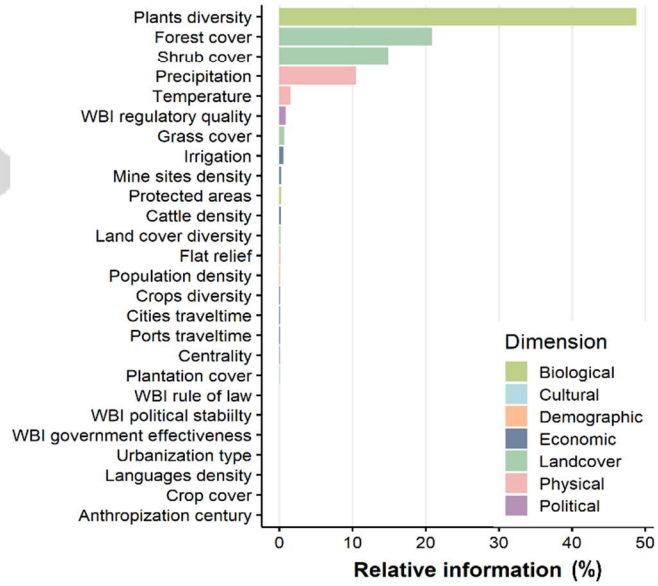SELS

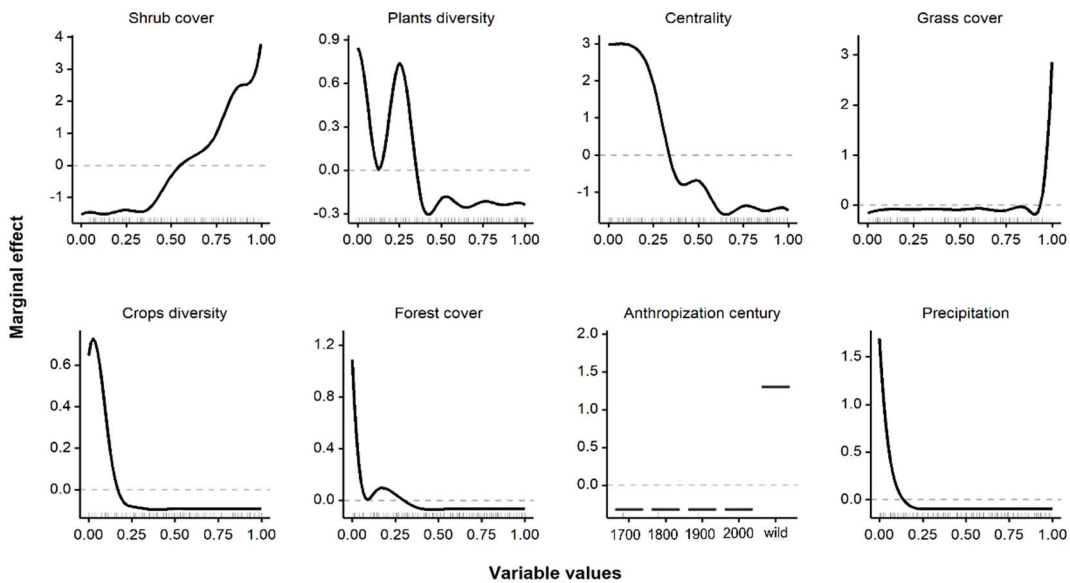A3. Low-diversity cold and temperate grassy rangelands

A. Variables boxplots

B. SELS distribution map
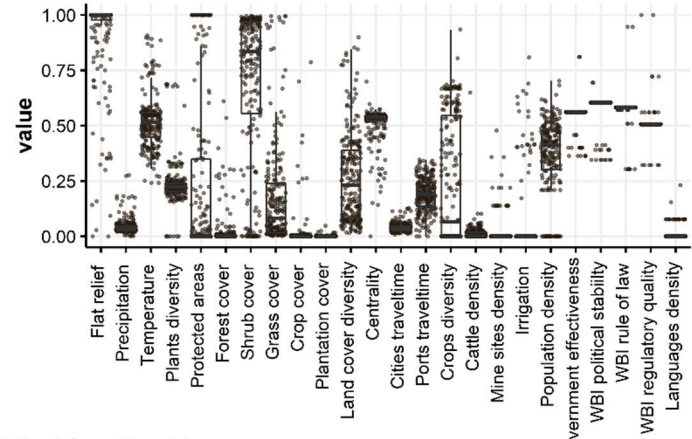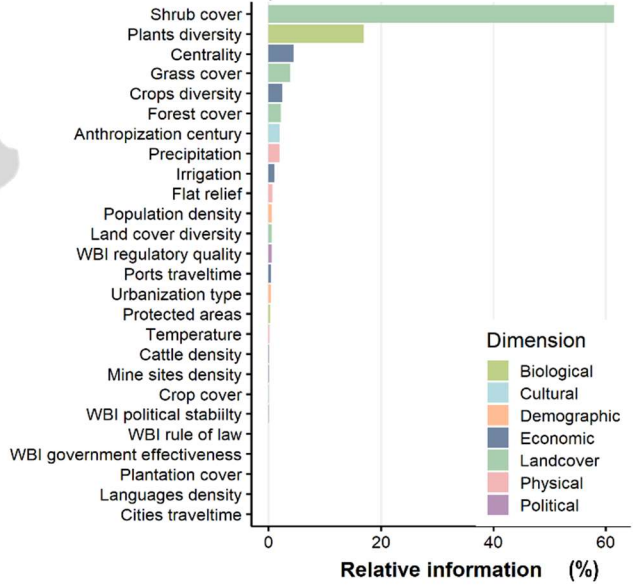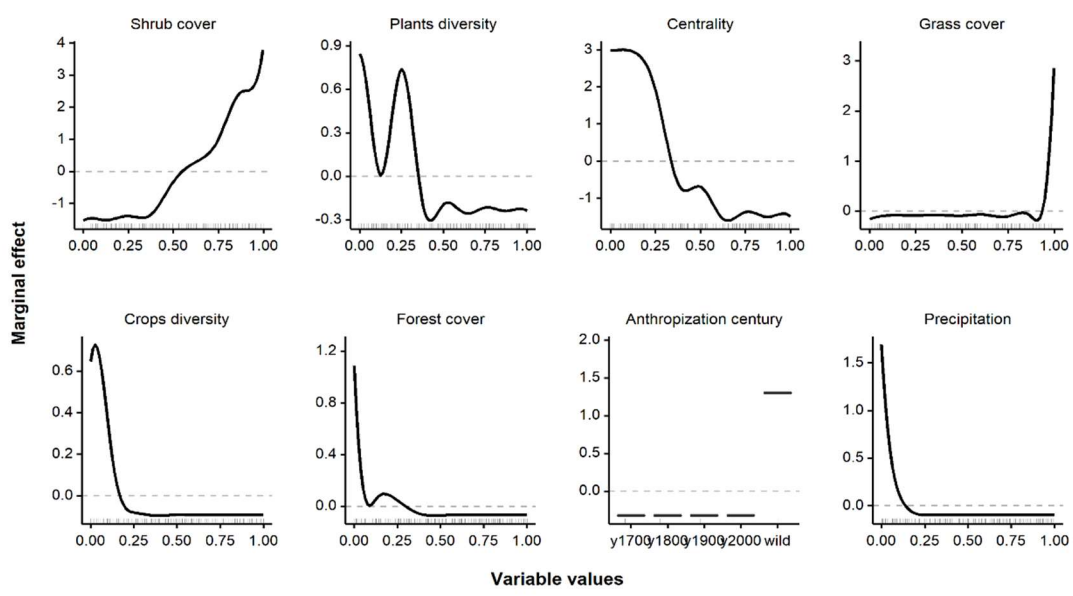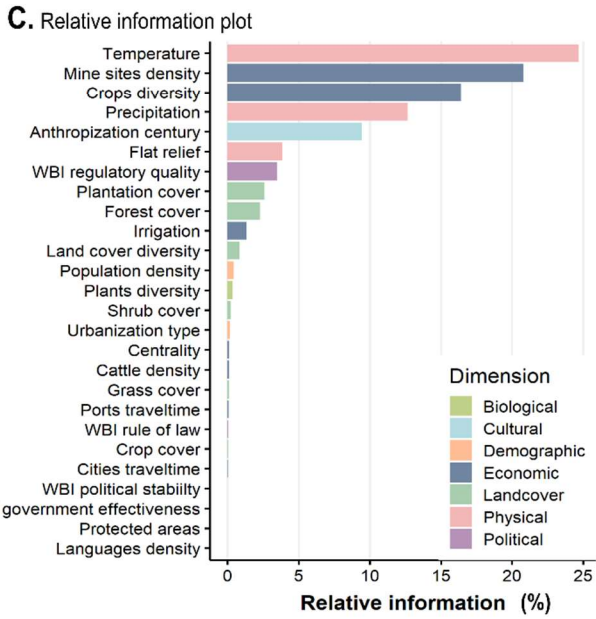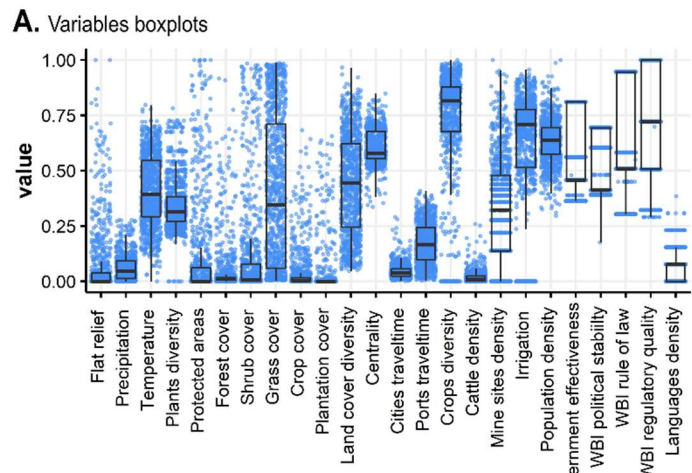

C. Relative information plot

D. Partial dependence plots

SER
A. Sparsely Populated Southern

SELS
A4. Low-diversity low-populated shrubby rangelands

A. Variables boxplots

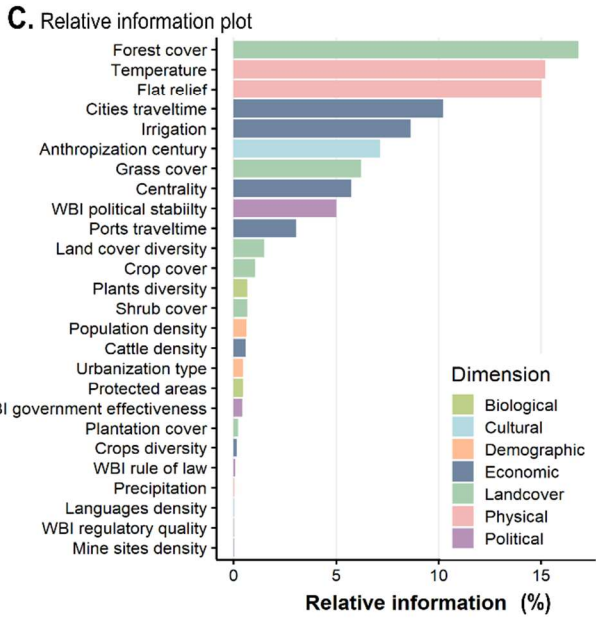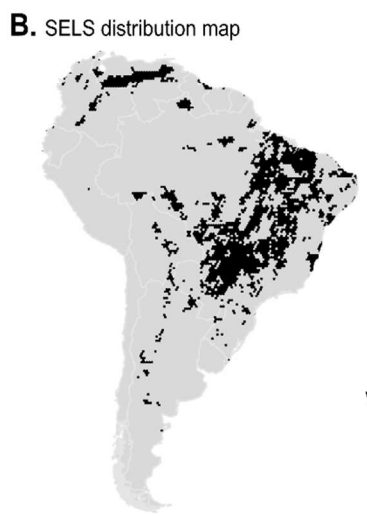**B.** SELS distribution map

C. Relative information plot

D. Partial dependence plots

SER

SELS

B1. Arid and semi-arid highlands and coast, with long history of agriculture and mining

A. Variables boxplots

B. SELS distribution map

C. Relative information plot
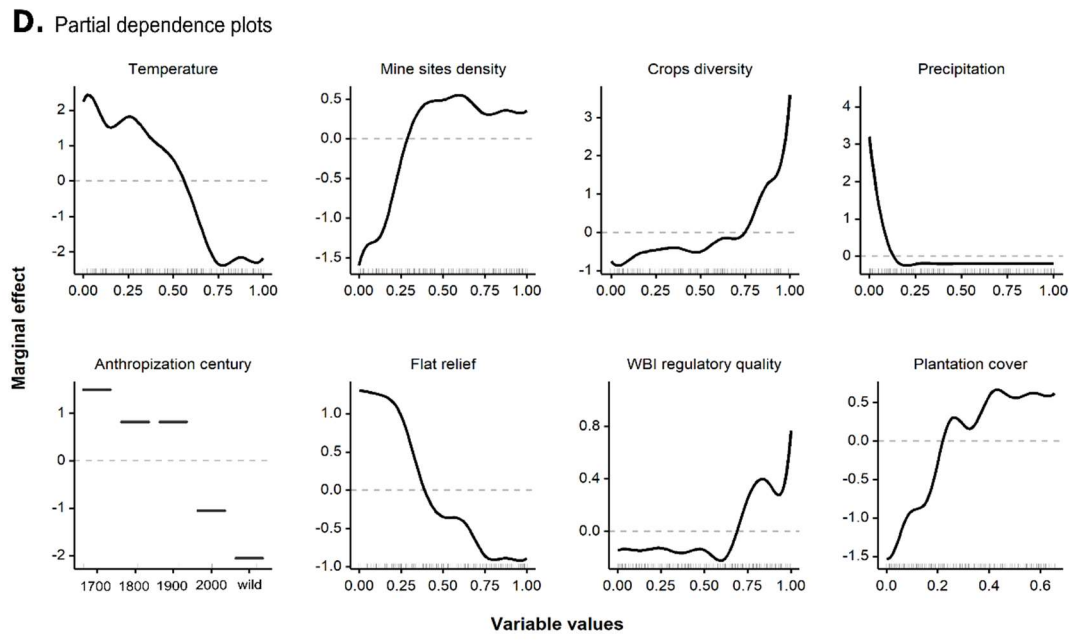
D. Partial dependence plots

C. Consolidated large scale agropastoral plains

C1. Urbanized large scale agricultural plains

A. Variables boxplots
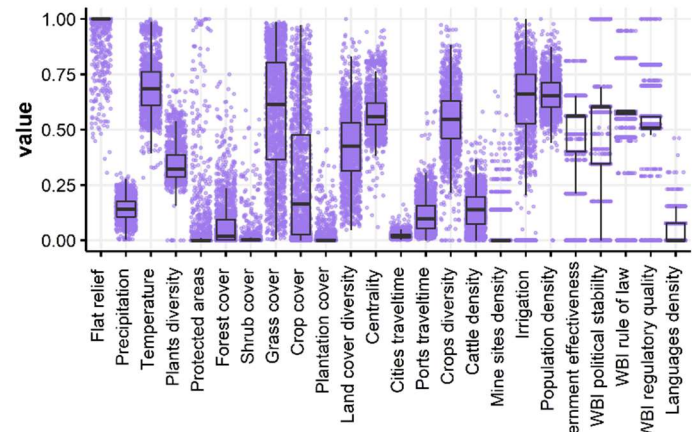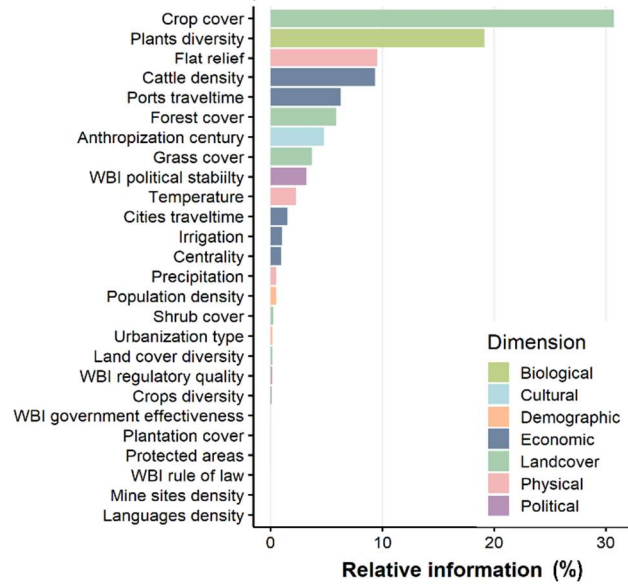
B. SELS distribution map
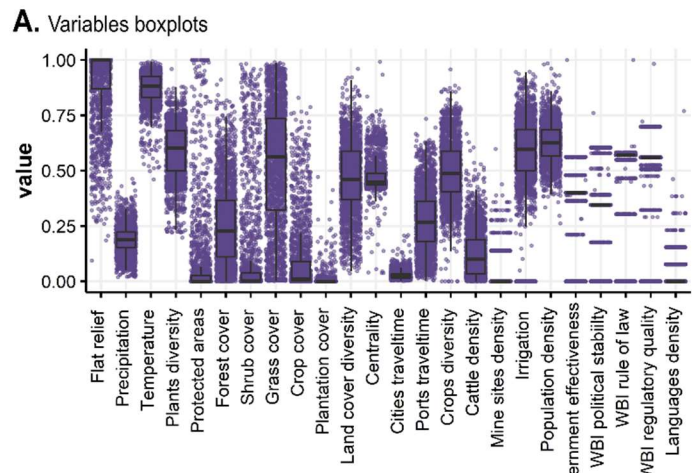

C. Relative information plot

D. Partial dependence plots

7
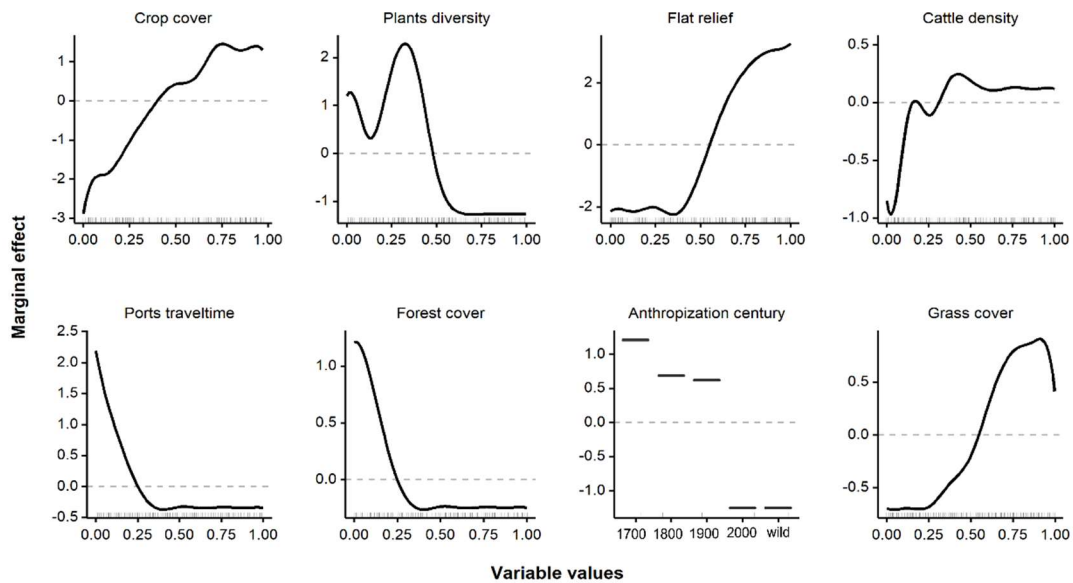
C. Consolidated large scale agropastoral plains

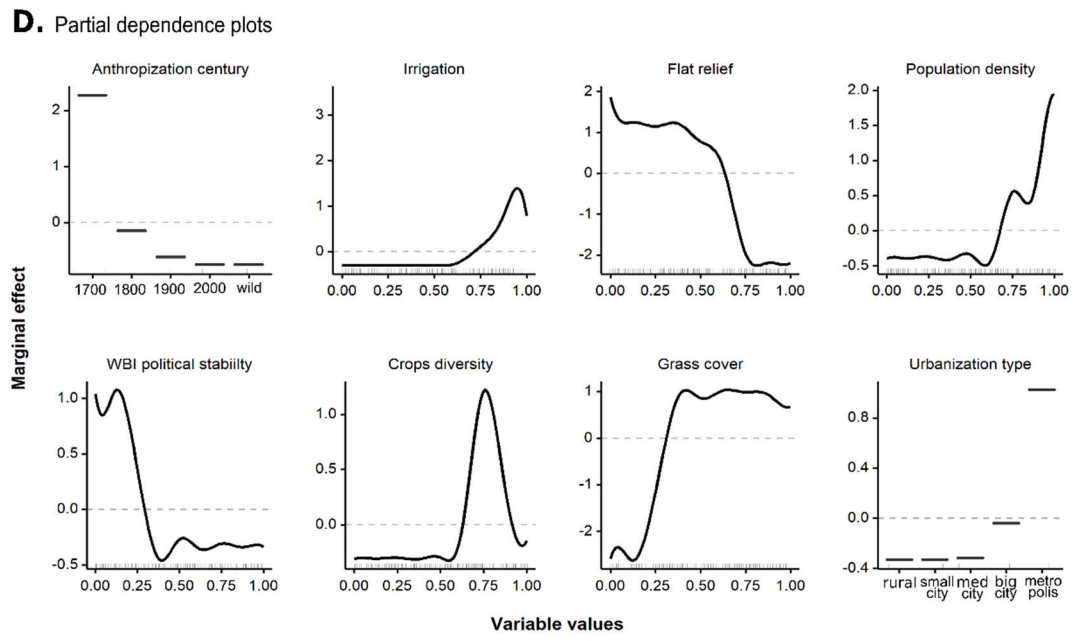## C2. Consolidation of agro pastoral lands in savannas and semi-deciduous forest

A. Variables boxplots

B. SELS distribution map

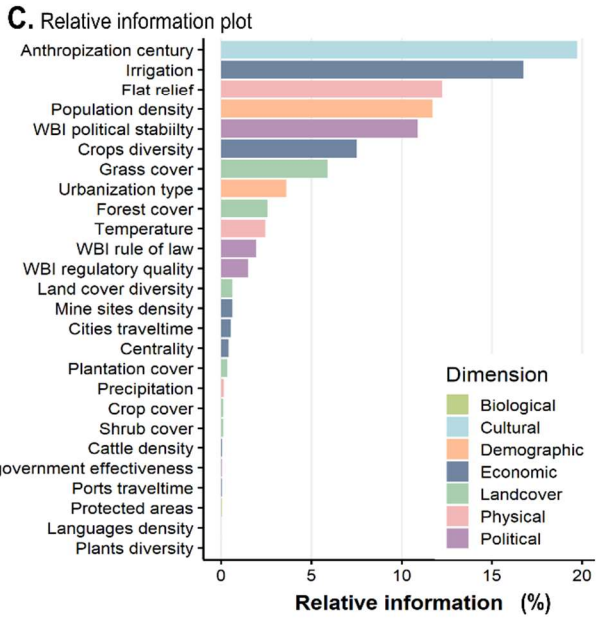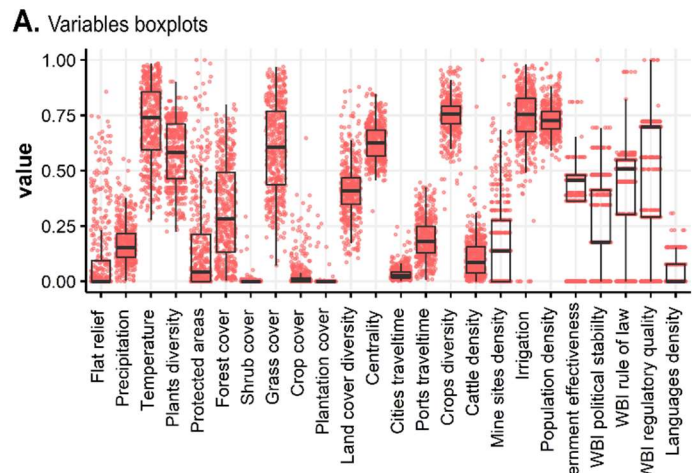**C.** Relative information plot

D. Partial dependence plots

D. Historically used tropical areas with low potential for modern agriculture

D1. High density montane populations with agro pastoral activity

A. Variables boxplots

B. SELS distribution map

C. Relative information plot

Dimension
- Biological
- Cultural
- Demographic
- Economic
- Landcover
- Physical
- Political

D. Partial dependence plots

A. Variables boxplots

B. SELS distribution map

C. Relative information plot

D. Partial dependence plots

SER / **SELS**

D. Historically used tropical areas with low potential for modern agriculture

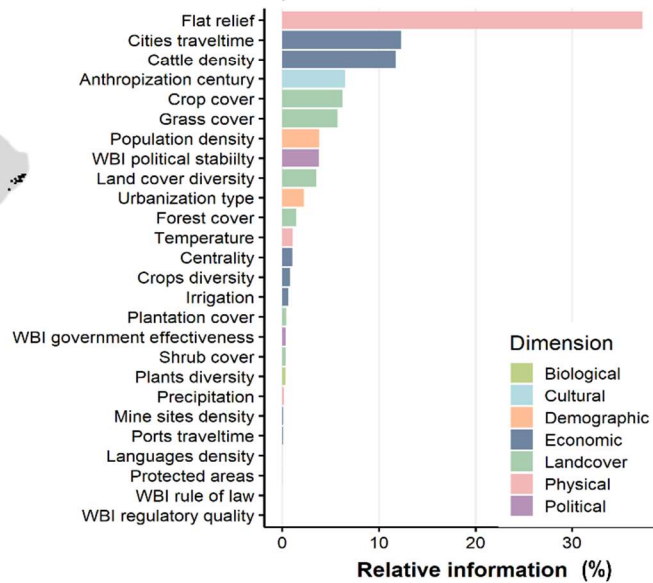D2. Intensive, market-connected hilly agropastoral systems with long colonization history
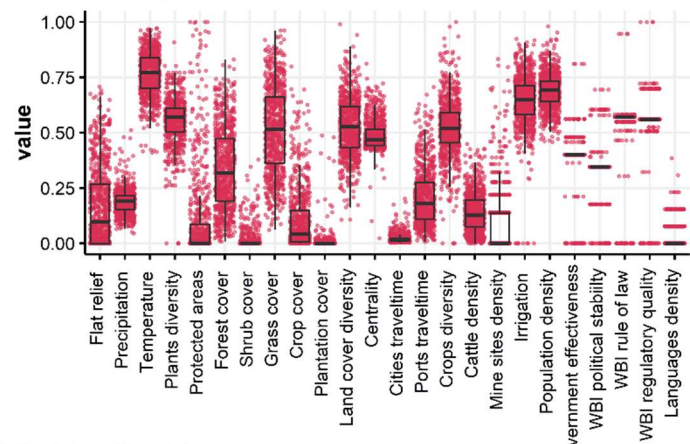
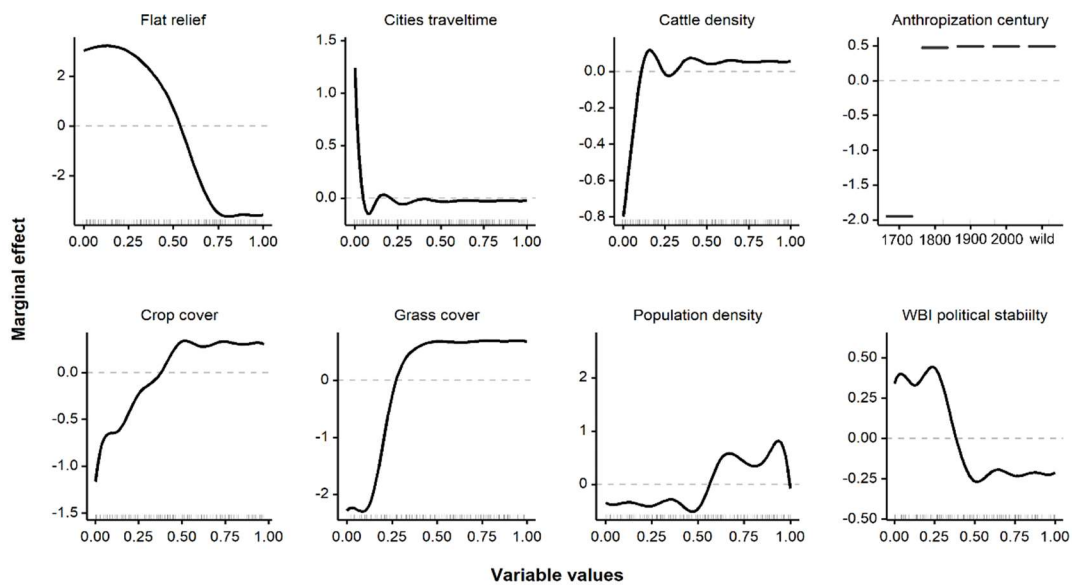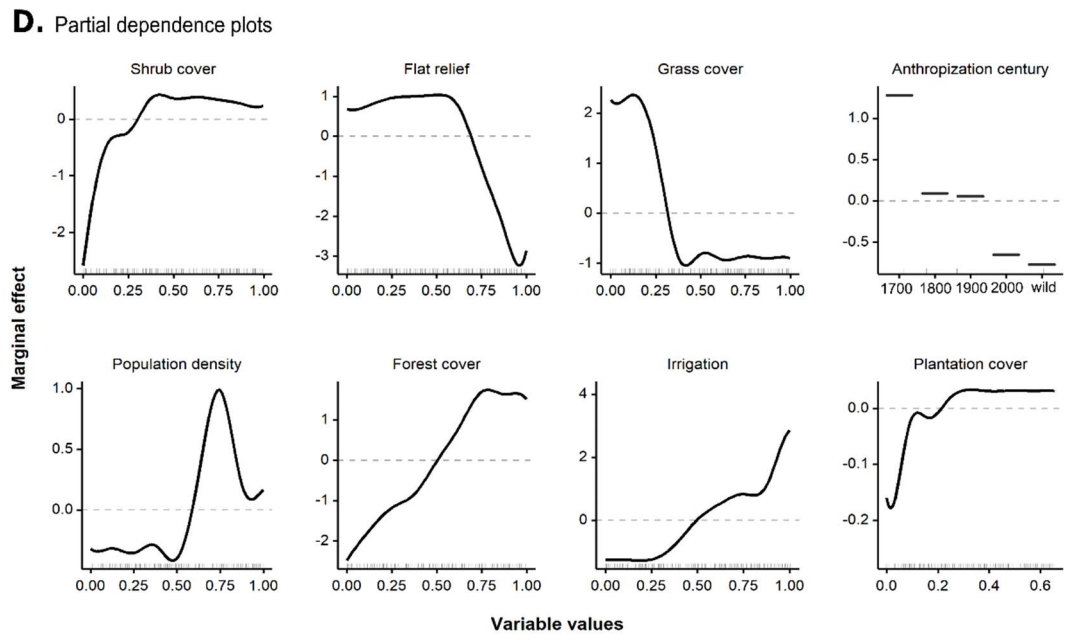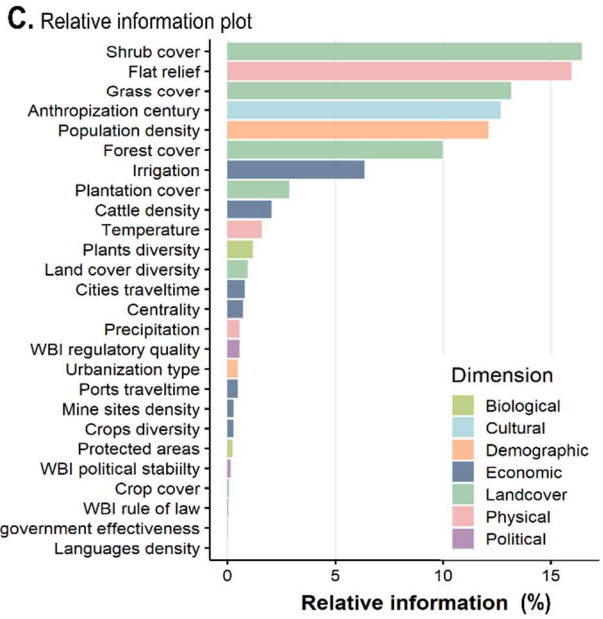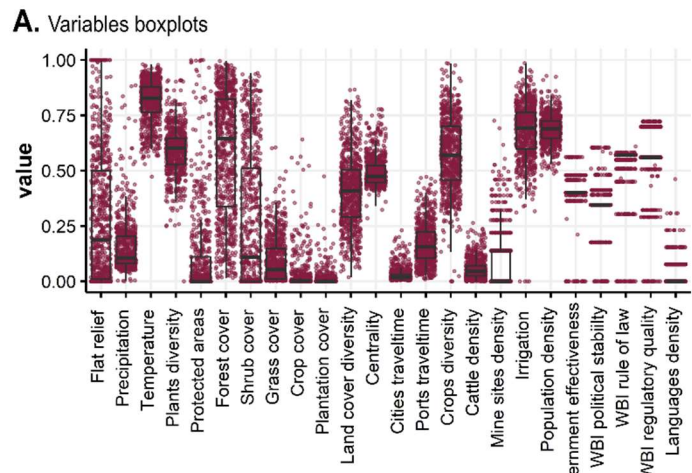**SER** D. Historically used tropical areas with low potential for modern agriculture

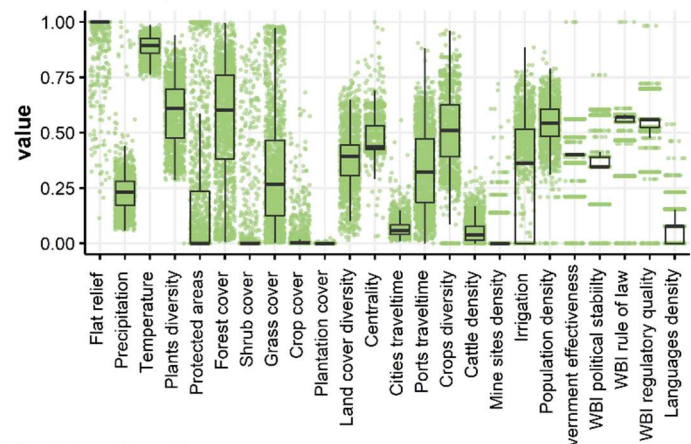**SELS** D3. Highly populated and biodiverse historical semi-arid areas

A. Variables boxplots

B. SELS distribution map

C. Relative information plot

Dimension
- Biological
- Cultural
- Demographic
- Economic
- Landcover
- Physical
- Political

D. Partial dependence plots

SER — E. Tropical forests with low anthropization

SELS — **E1. South American Lowlands: new agro-pastoral frontiers**

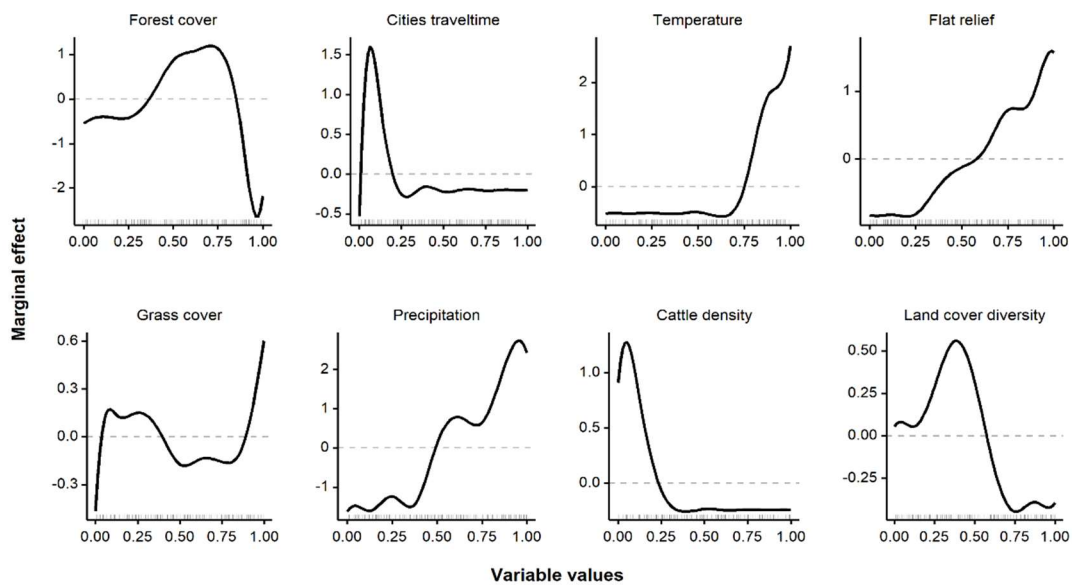**A.** Variables boxplots

B. SELS distribution map

C. Relative information plot

Dimension
- Biological
- Cultural
- Demographic
- Economic
- Landcover
- Physical
- Political

Relative information (%)

D. Partial dependence plots

Marginal effect
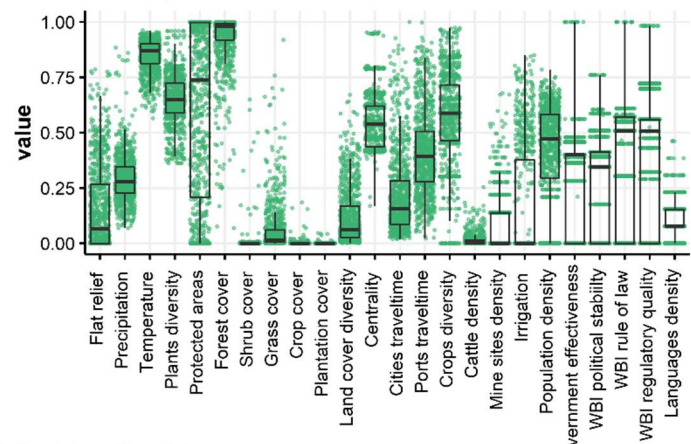
Variable values
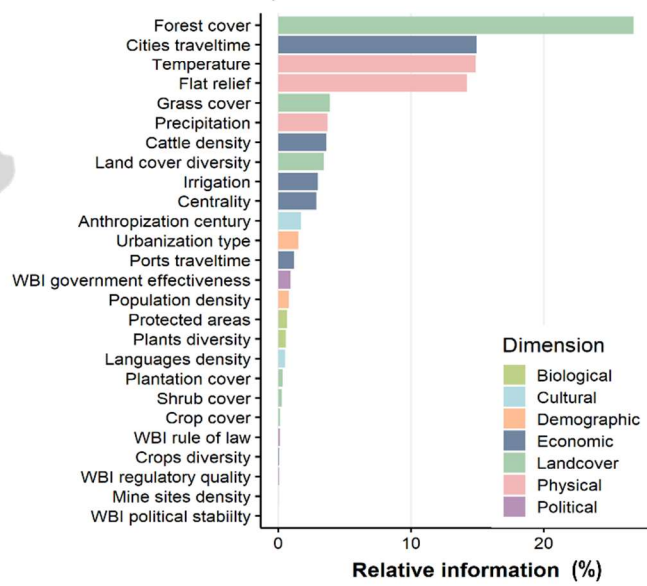
SER — E. Tropical forests with low anthropization

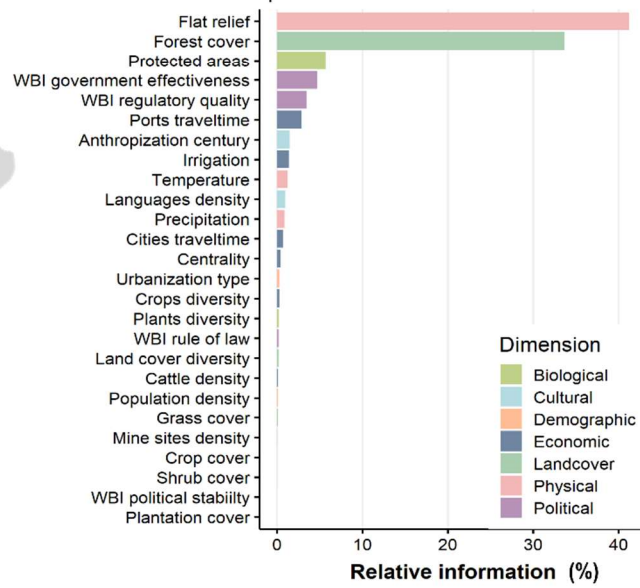**SELS** — E2. Remote and mountainous tropical lands
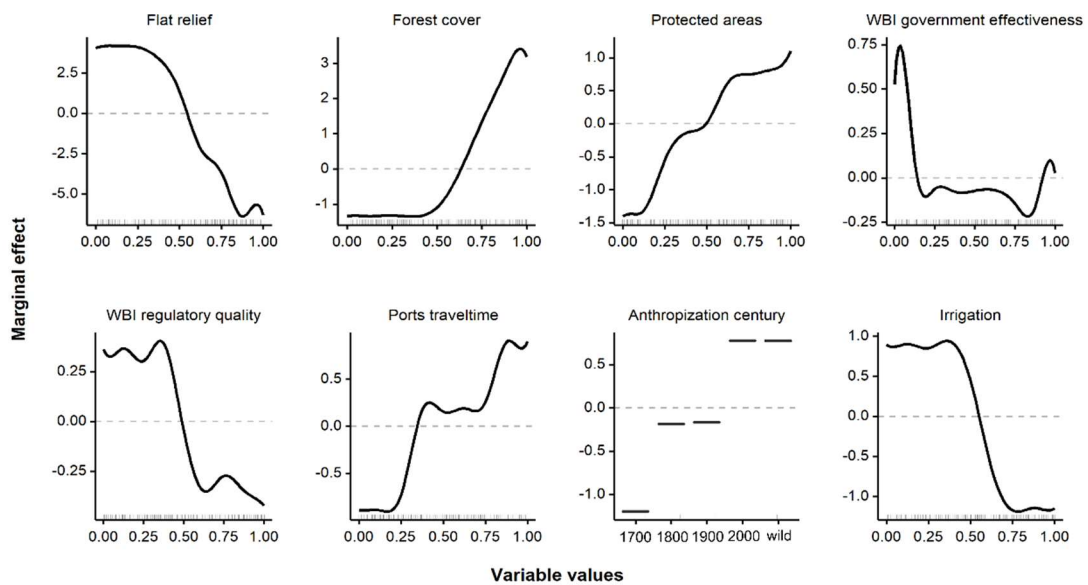
A. Variables boxplots

B. SELS distribution map

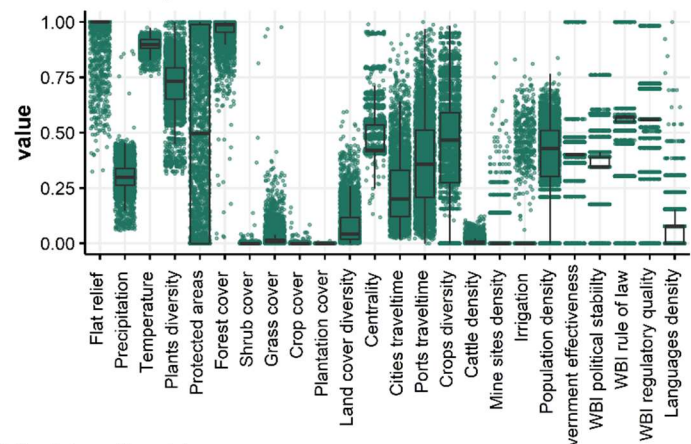**C.** Relative information plot

D. Partial dependence plots

SER

E. Tropical forests with low anthropization

SELS

E3. Tropical forests with low anthropogenic conversion

A. Variables boxplots

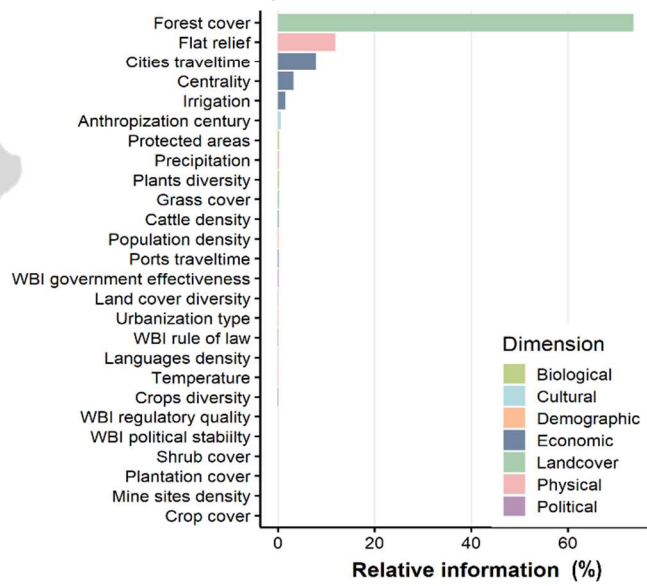**B.** SELS distribution map

C. Relative information plot

D. Partial dependence plots