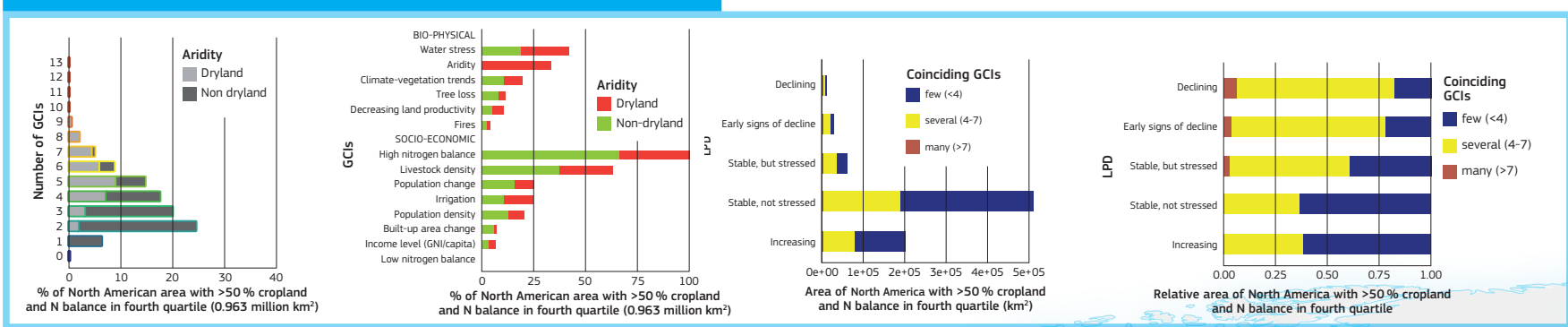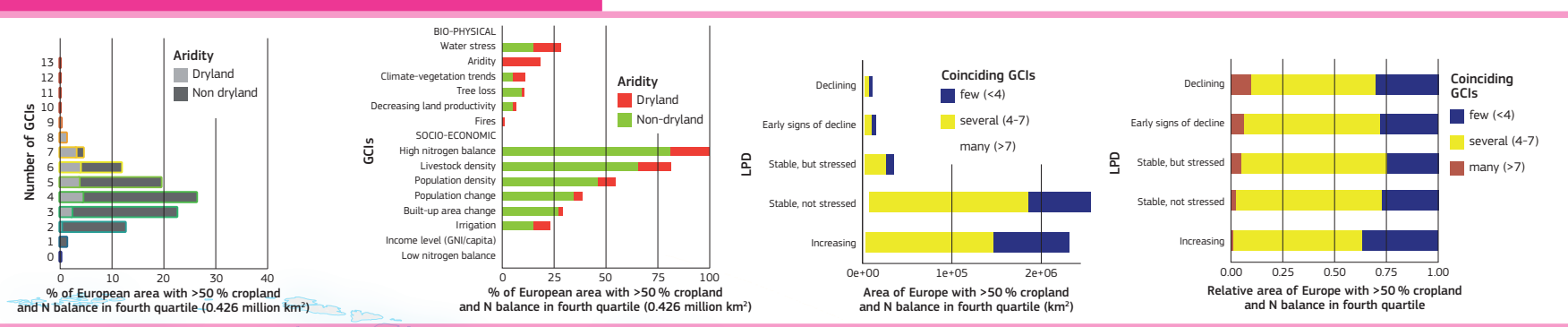# Convergence of Evidence: High Density – High Input Cropland

High density – high input cropland are areas where >50% of each grid cell (1 km²) is under cultivation and where there is a high rate of nitrogen fertiliser application

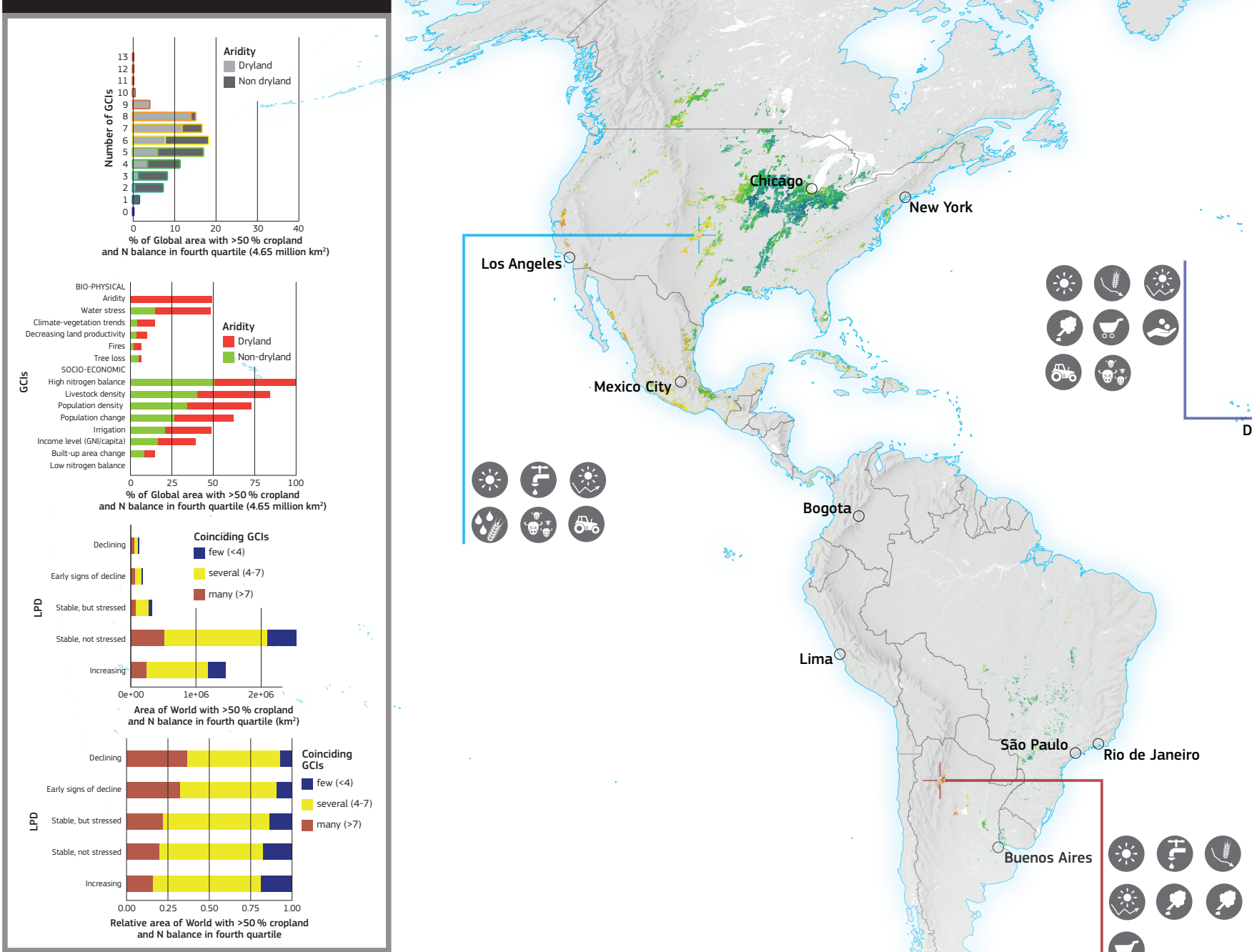Distributions of predominant issues in NORTH AMERICA

Distributions of predominant issues in EUROPE
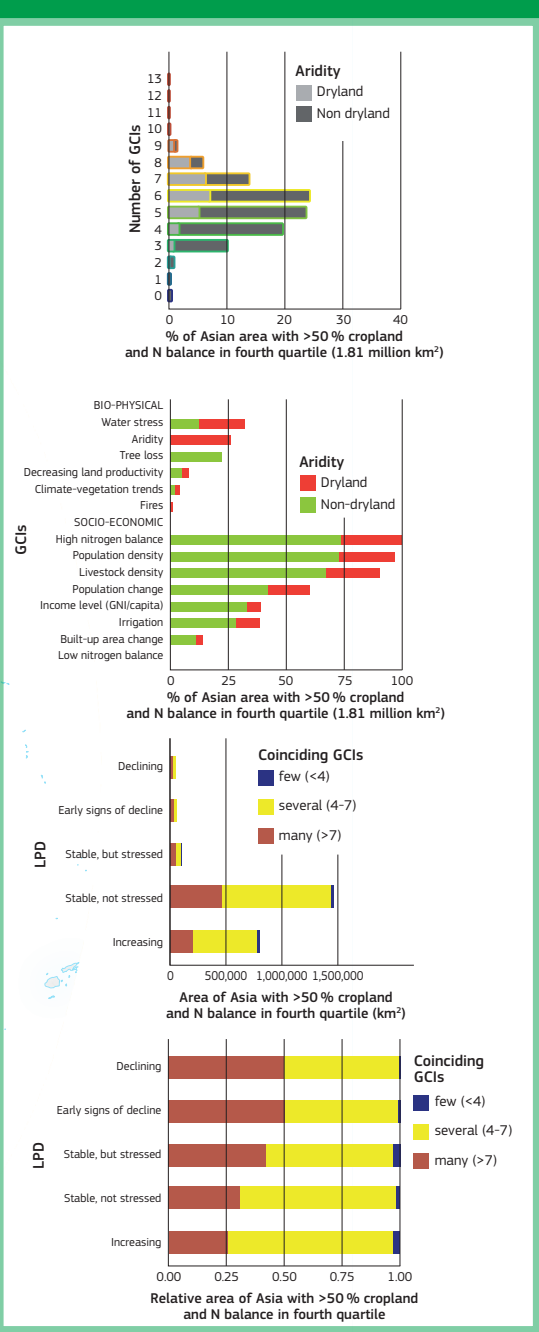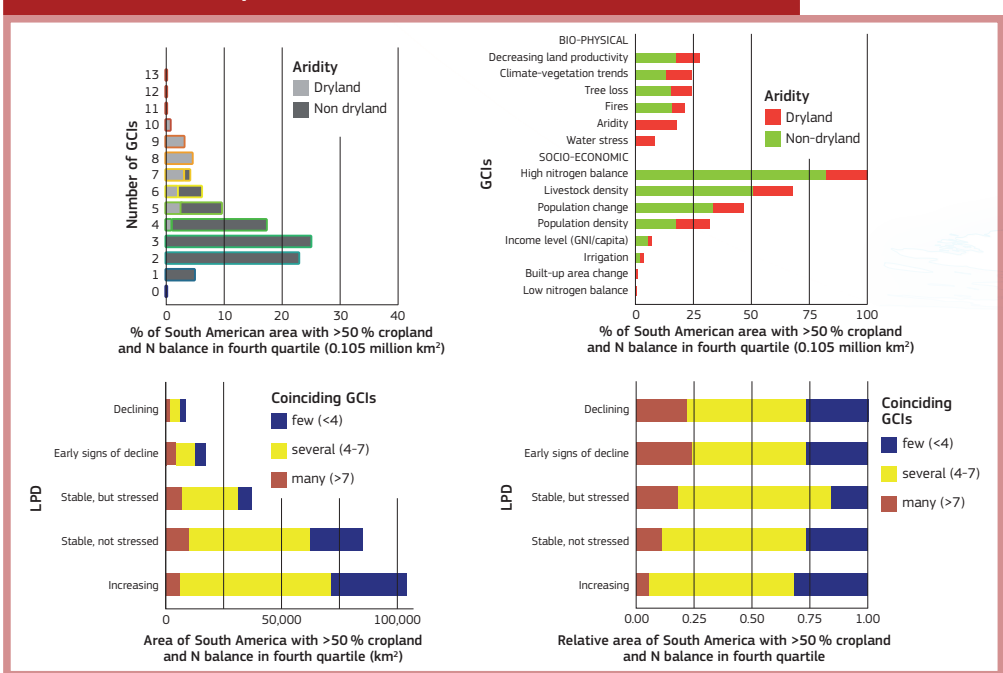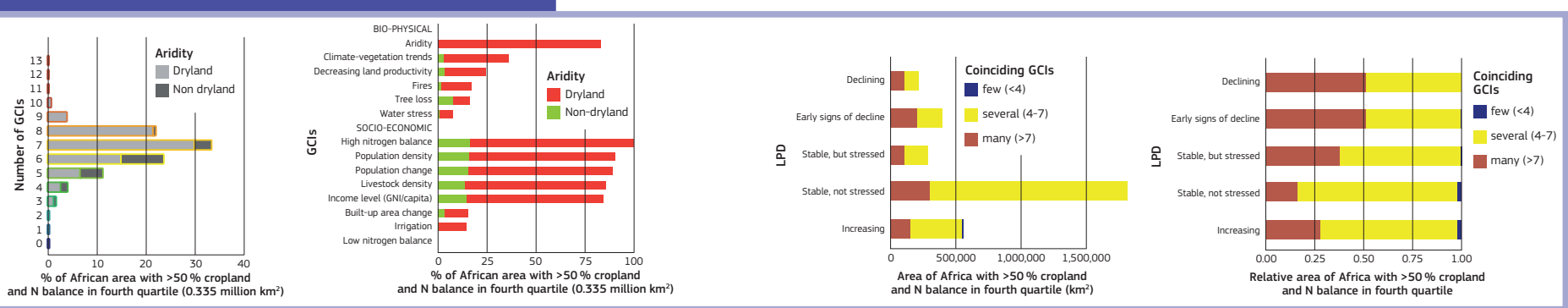
Distributions of predominant issues in WORLD
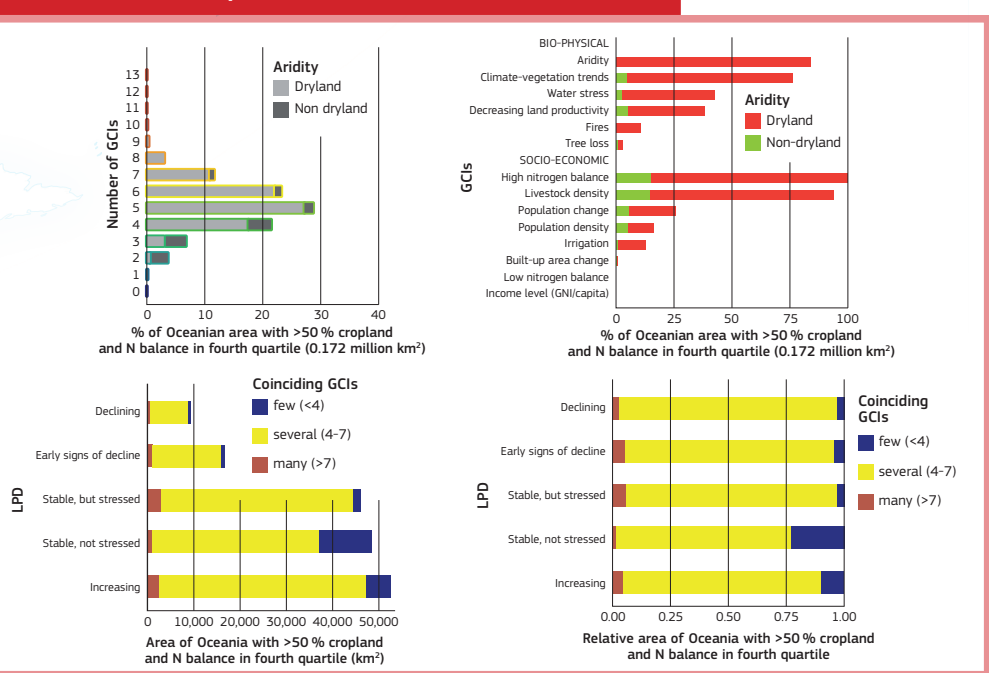
Distributions of predominant issues in ASIA

Distributions of predominant issues in SOUTH AMERICA

Distributions of predominant issues in OCEANIA

Distributions of predominant issues in AFRICA

Number of coincident issues
0 1 2 3 4 5 6 7 8 9 10 11 12 13

Convergence of Evidence: High Density – High Input Cropland

Examples of global regions where high density – high input cropland are affected by global change issues (GCIs; see Table, page 145) include:
- Africa: Nile delta of Egypt, east Sudan, Kenya and Tanzania (around Lake Victoria), Malawi, Zimbabwe, and west Senegal;
- Middle East: cropland in Syria, Iraq and Iran;
- Asia: large areas in east China and scattered zones in western China; southern Vietnam, and areas in Pakistan and India; Central Asia: Kyrgyzstan and Uzbekistan;
- Europe: central Spain, southern Italy, Turkey.

Global change issues (GCIs) associated with transformations (including land degradation) in high density – high input cropland include high livestock numbers (in about 85% of the area), irrigation, and water stress (about 50% of the area).

Analysis shows that in high density – high input cropland:
- About 20% (or 0.9 million km^2) of the high density – high input cropland area experiences potential pressure from 8 to 13 GCIs. Signs of land productivity decline are observed in 19% of this area (0.17 million km^2).
- Approximately 62% (2.9 million km^2) of the high density – high input cropland area experiences potential pressure from 4 to 7 GCIs. Signs of land productivity decline are observed in 13% of this area (0.37 million km^2).
- Approximately 17% (0.8 million km^2) of the high density – high input cropland area experiences potential pressure from 1-3 GCIs. Signs of land productivity decline are observed in 9% of this area (0.07 million km^2).
- Less than 1% have no GCIs.

- The global distribution of high density-high input cropland is equally distributed between drylands (49%) and non-drylands (51%).
- Along with high population density and change, elevated livestock densities is an important GCI in these systems (ranging from 60% in North America to 90% in Asia).
- More coinciding issues show more land productivity decline.

Globally, 31% of croplands are high density – high input systems, half of which are experiencing 6 or more global change issues.

At a continental scale, some patterns with regard to high density-high input cropping systems and global change issues (GCIs) emerge:
- **Africa**. The Nile delta is known for high density, irrigated agriculture, where population density and changes coincide with low income and high livestock densities. Declining land productivity, tree loss, fires, livestock density, population increase and low income (up to 85% of the area) are coincident over these cropping systems in east and southern Africa.
- **Asia**. In eastern China, population density and change and expanding built-up area are common GCIs. The sharp division visible on the map is due to aridity: the area to the north is dryland and there also water stress plays a role. In north and north-eastern China, a relatively large area of improving land productivity is however subject to pressures from GCIs, such as irrigation, high livestock densities, population change and built-up area; these aspects reflect the expanding and intensifying agriculture. Similar combinations might also be critical in regions where low income is an issue, such as in India.

- **South America**. Only 2.3% of the total area of South America is made-up of high density-high input cropland. However, in the Argentinean Chaco there is evidence that these new cropping areas require further study as to their susceptibility to land degradation.
- **Europe**. Increasing population and loss of land due to built-up areas are pressing issues, while expanding irrigation combined with water stress is of concern in southern Europe.
- **North America**. While this region has the fewest coincident GCIs, the ones of interest here are water stress, livestock densities, fire, population, and decreasing land productivity.
- **Oceania**. In west and southeast Australia, coincident GCIs include frequent drought conditions, high livestock densities and irrigation. In 38% of these high density-high input areas, land productivity is decreasing or stressed.

In areas of high density – high input agriculture, fewer global change issues coincide where income levels are low. Notable exceptions are in China (particularly in drylands) and low income areas in Africa and India.

- Theme layer derived from: FAO GLC-SHARE v1.0[39], 2014 and nitrogen balance on landscape: West P. 2014[25] (see page 54).
- This map has grid cells of 1 km^2.
- Statistics - in total area (km^2) or percentage of total area - are given for both global and/or continental scales.
- Refer to global change issues (GCIs) in the table on page 145.
- Refer to 'how to read the maps' on page 146.