Cambio Climático y Agricultura

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Cambio Climático y Agricultura

1. La agricultura contribuye al cambio climático

2. Efectos del Cambio Climático en la agricultura

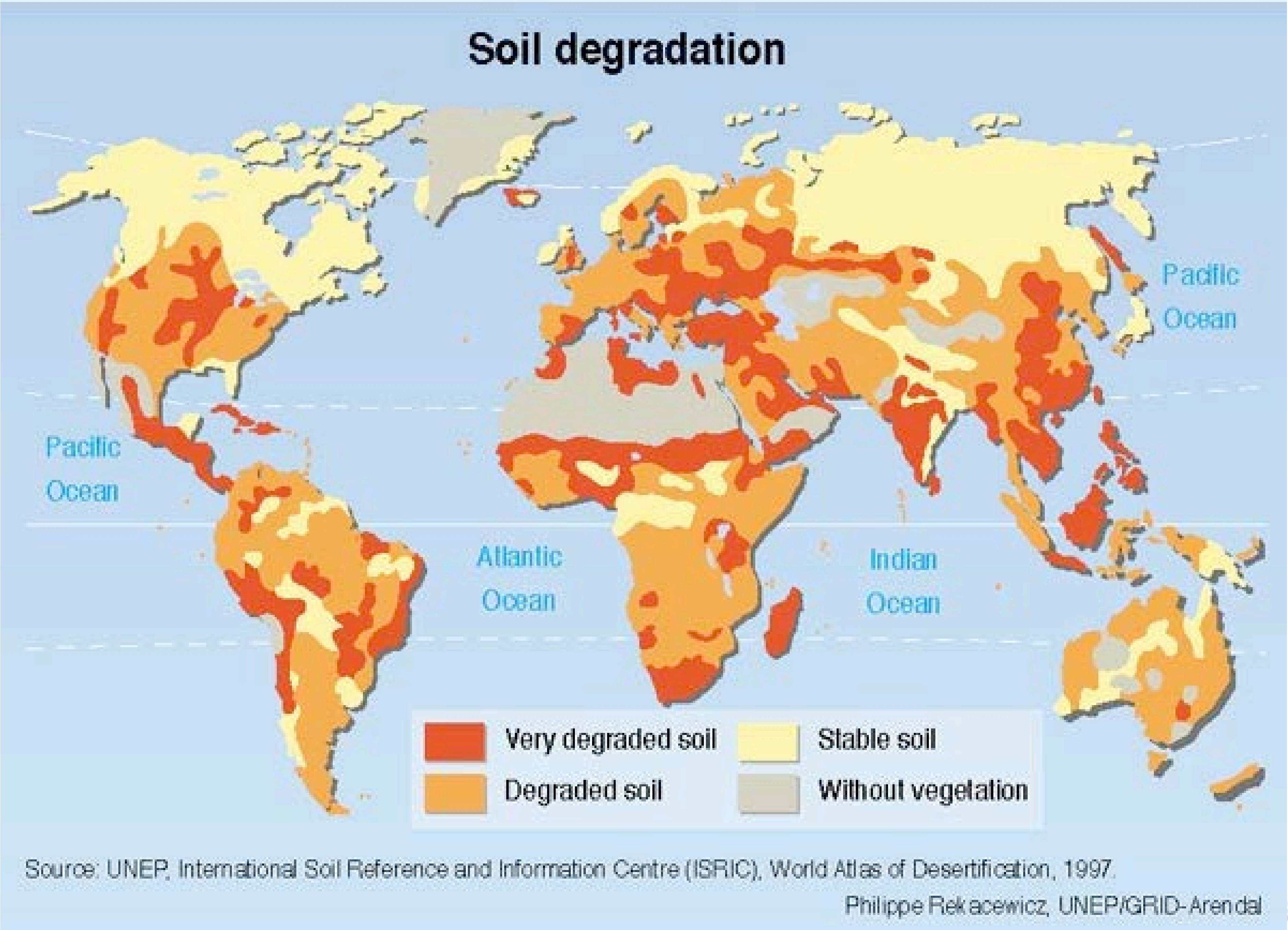
3. La agricultura como un potencial factor modulador del Cambio Climático

Cambio Climático es SOLO un factor de riesgo

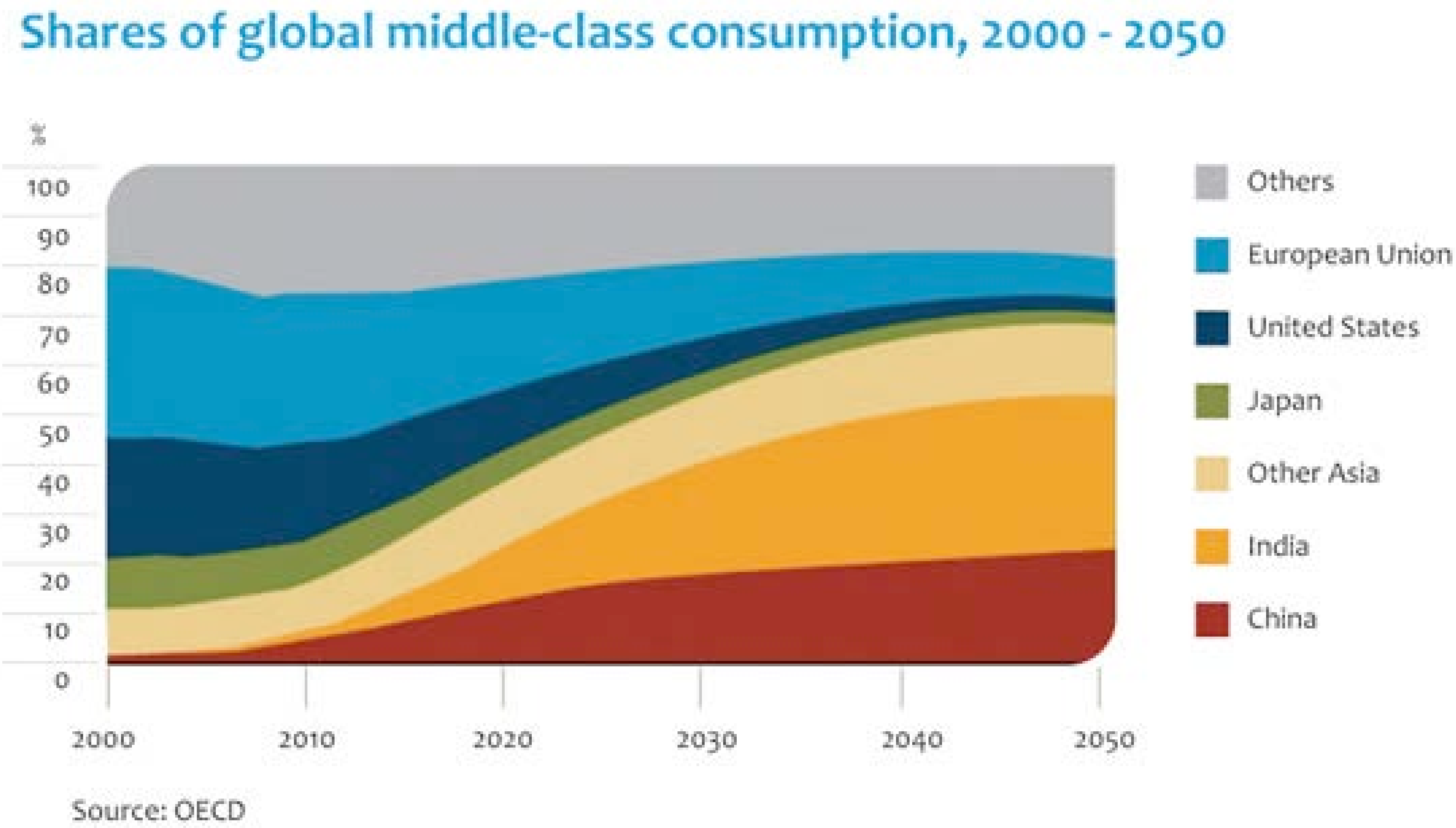
1. **Aumento de la población (2050)**
2. **Menor área cultivable per cápita**

Source: FAO

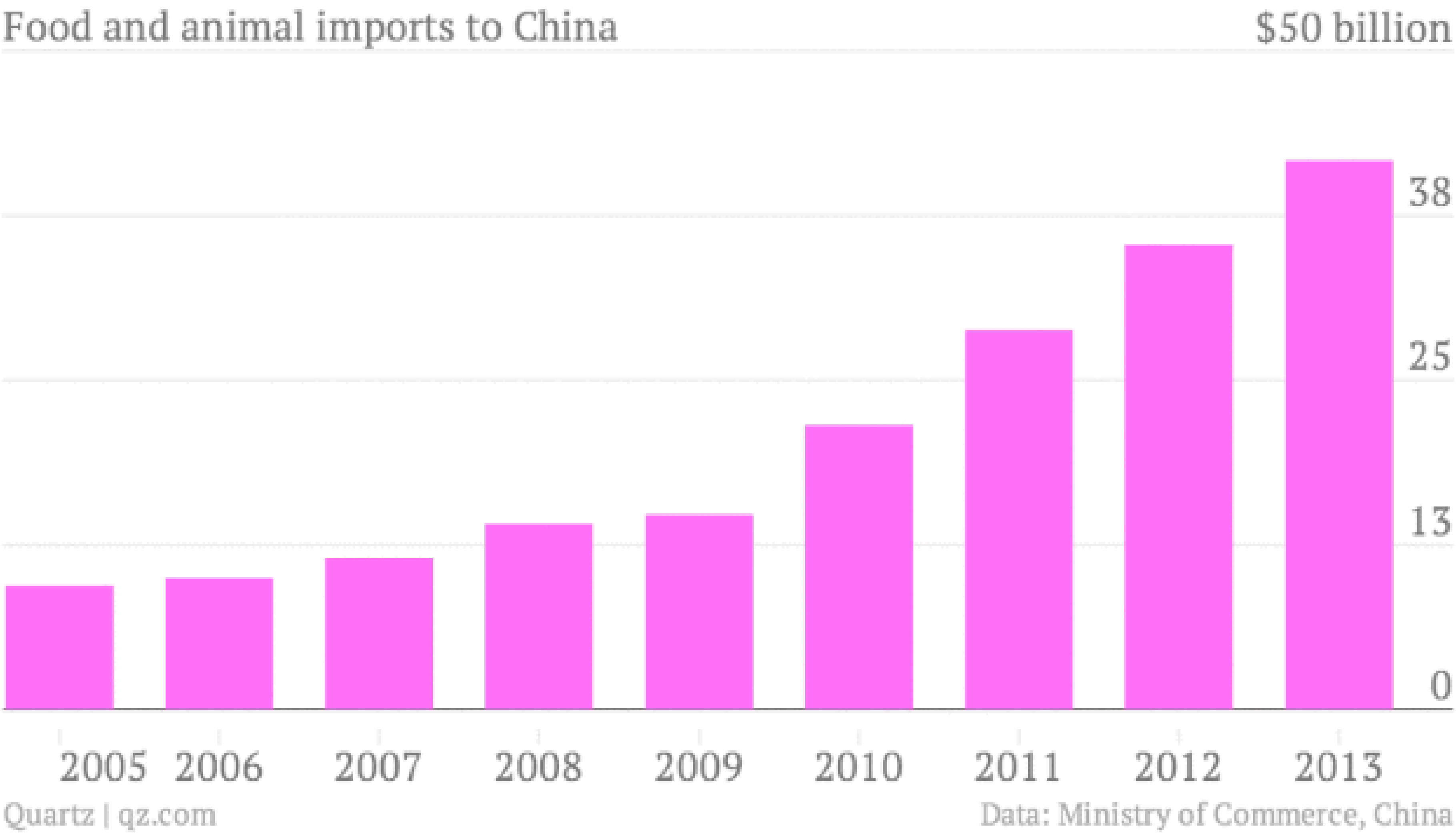
3. Degradación de suelos/urbanización



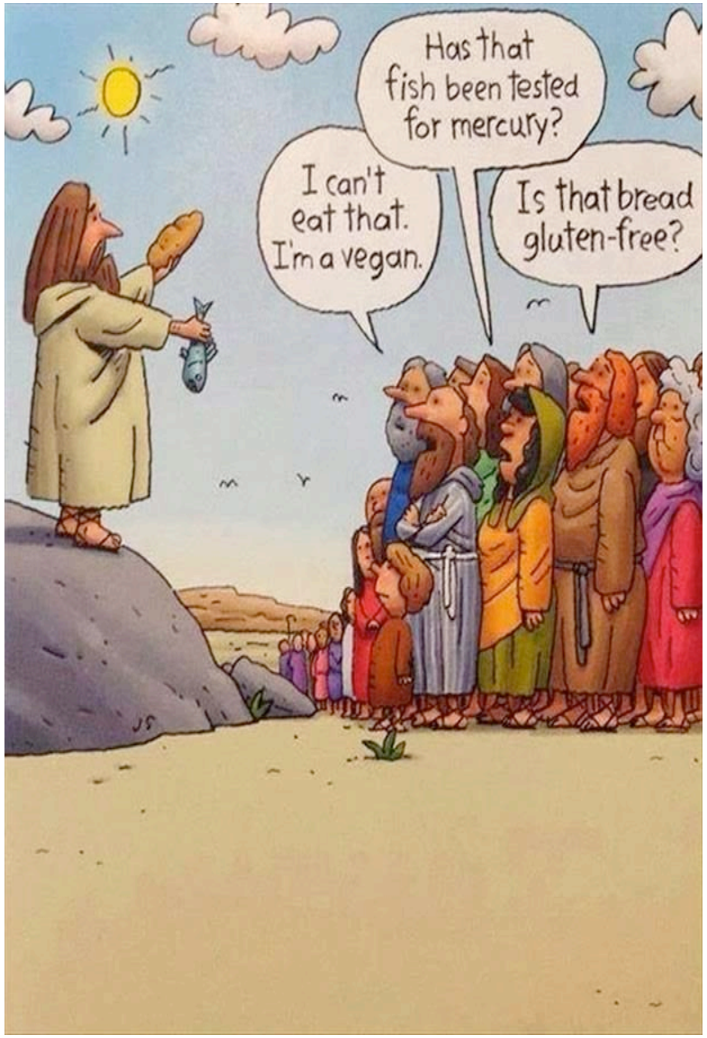
4. Aumento del Poder Adquisitivo/Clases medias



Who will Feed China?



5. Nuevas presiones socio culturales



La Industria de la Protesta llegó para quedarse

Retos de la Agricultura Peruana

Espárrago: Uso del Agua (Ica)

Palma Aceitera: Plantaciones (Ucayali)

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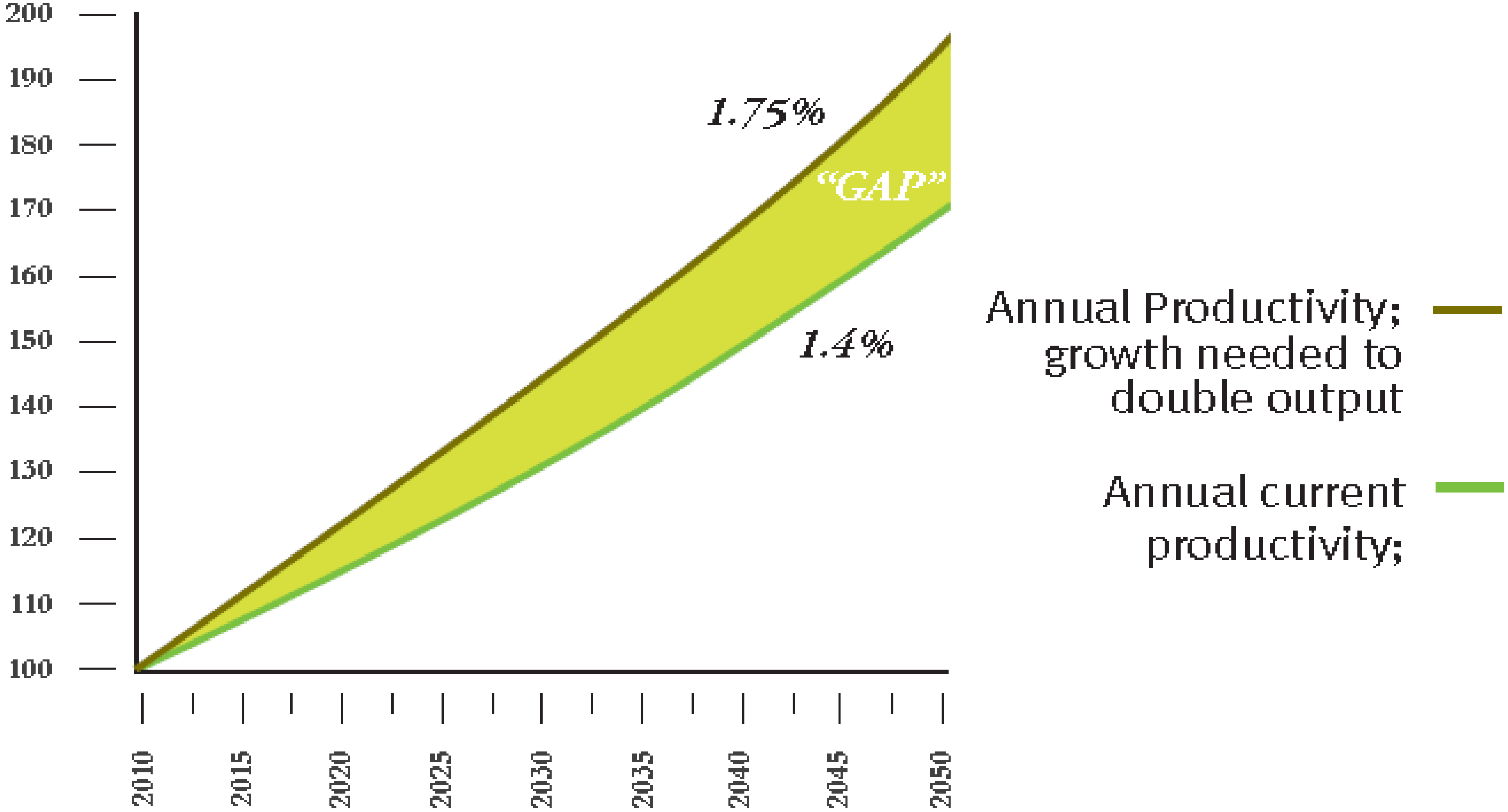
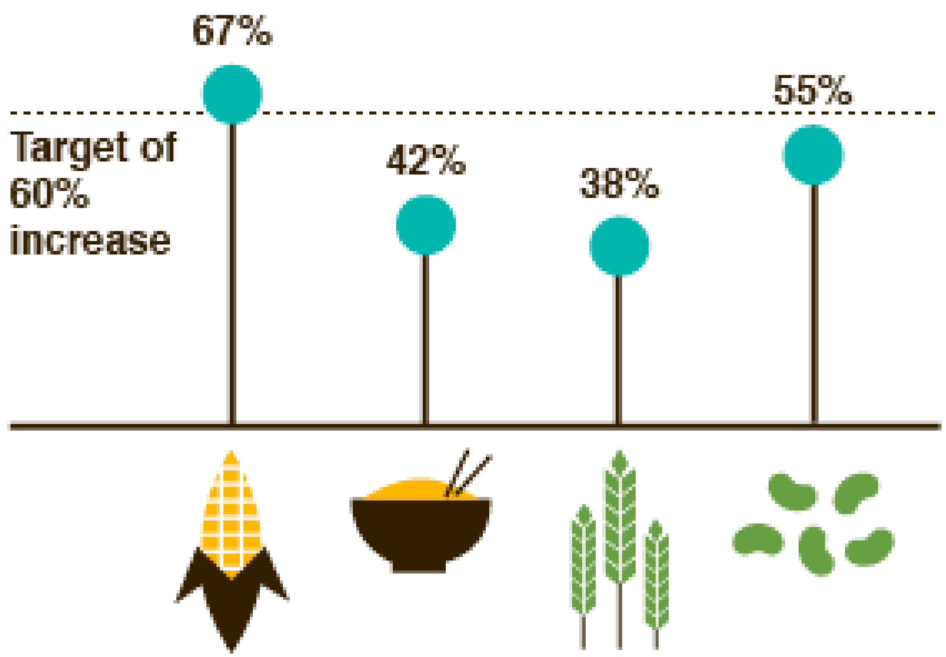
Brecha de Productividad Mundial: 2010-2050



inia
Instituto Nacional de Innovación Agraria

MINAGRI

Yields of maize, rice, wheat, and soybean all need to **INCREASE BY 60%,** by 2050 to meet demand but current growth in yield are falling short of the target.



Source: Ray et al., 2013

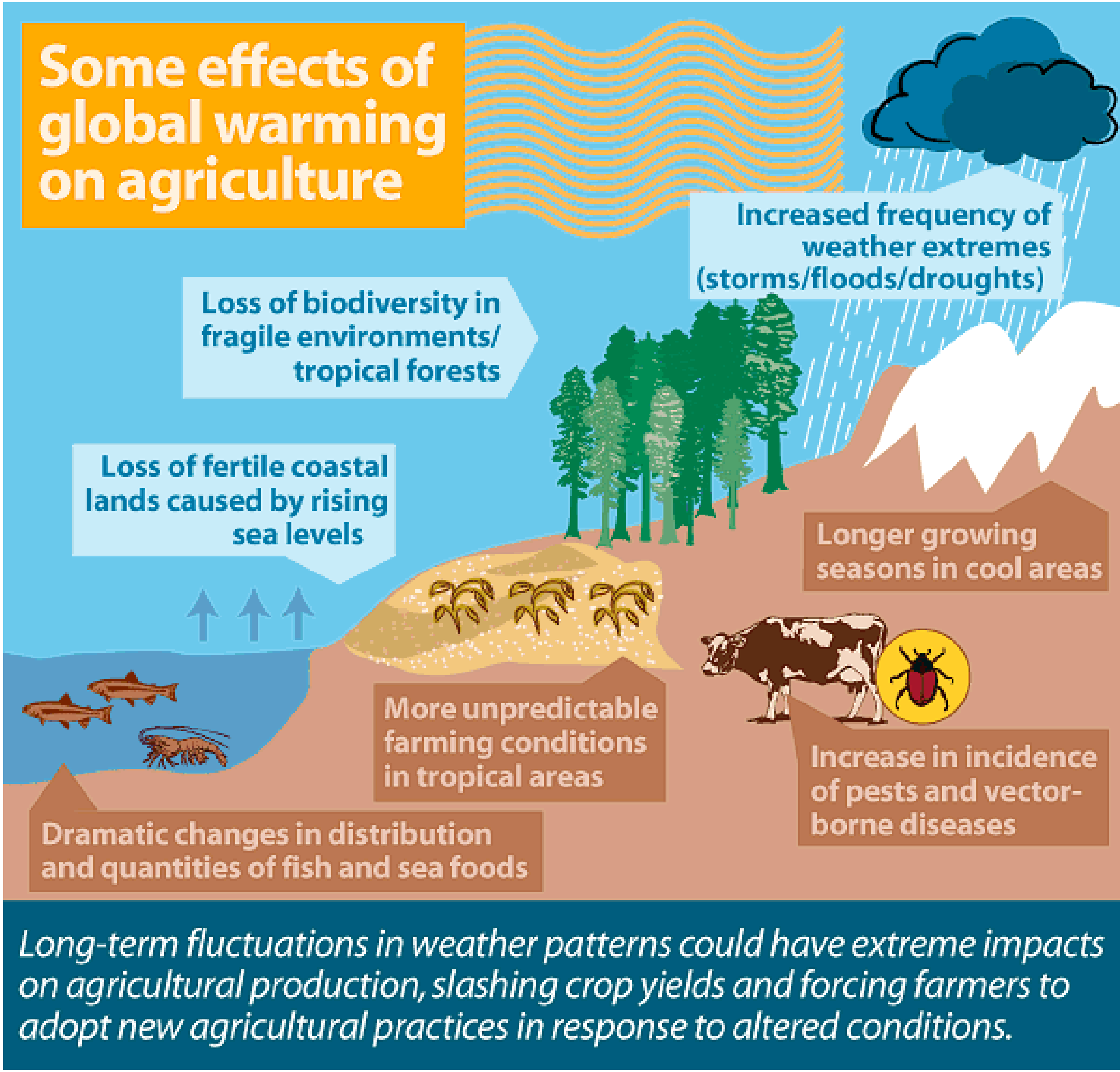
Big Facts

ccafs.cgiar.org/bigfacts

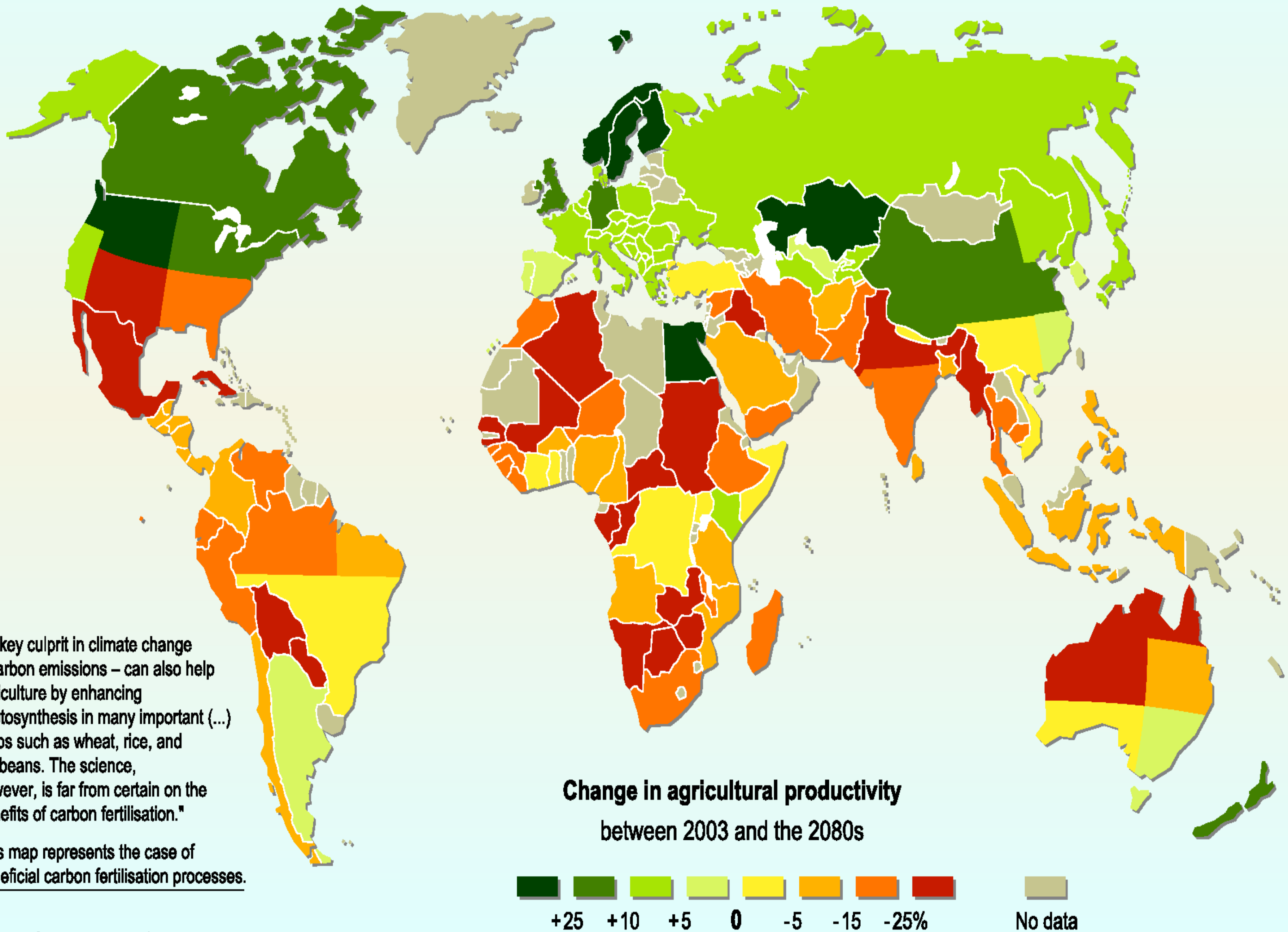
CGIAR

RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security

CCAFS


Some effects of global warming on agriculture
Increased frequency of weather extremes (storms/floods/droughts)
Loss of biodiversity in fragile environments/ tropical forests
Loss of fertile coastal lands caused by rising sea levels
Longer growing seasons in cool areas
More unpredictable farming conditions in tropical areas
Increase in incidence of pests and vector-borne diseases
Dramatic changes in distribution and quantities of fish and sea foods
Long-term fluctuations in weather patterns could have extreme impacts on agricultural production, slashing crop yields and forcing farmers to adopt new agricultural practices in response to altered conditions.

Projected impact of climate change on agricultural yields

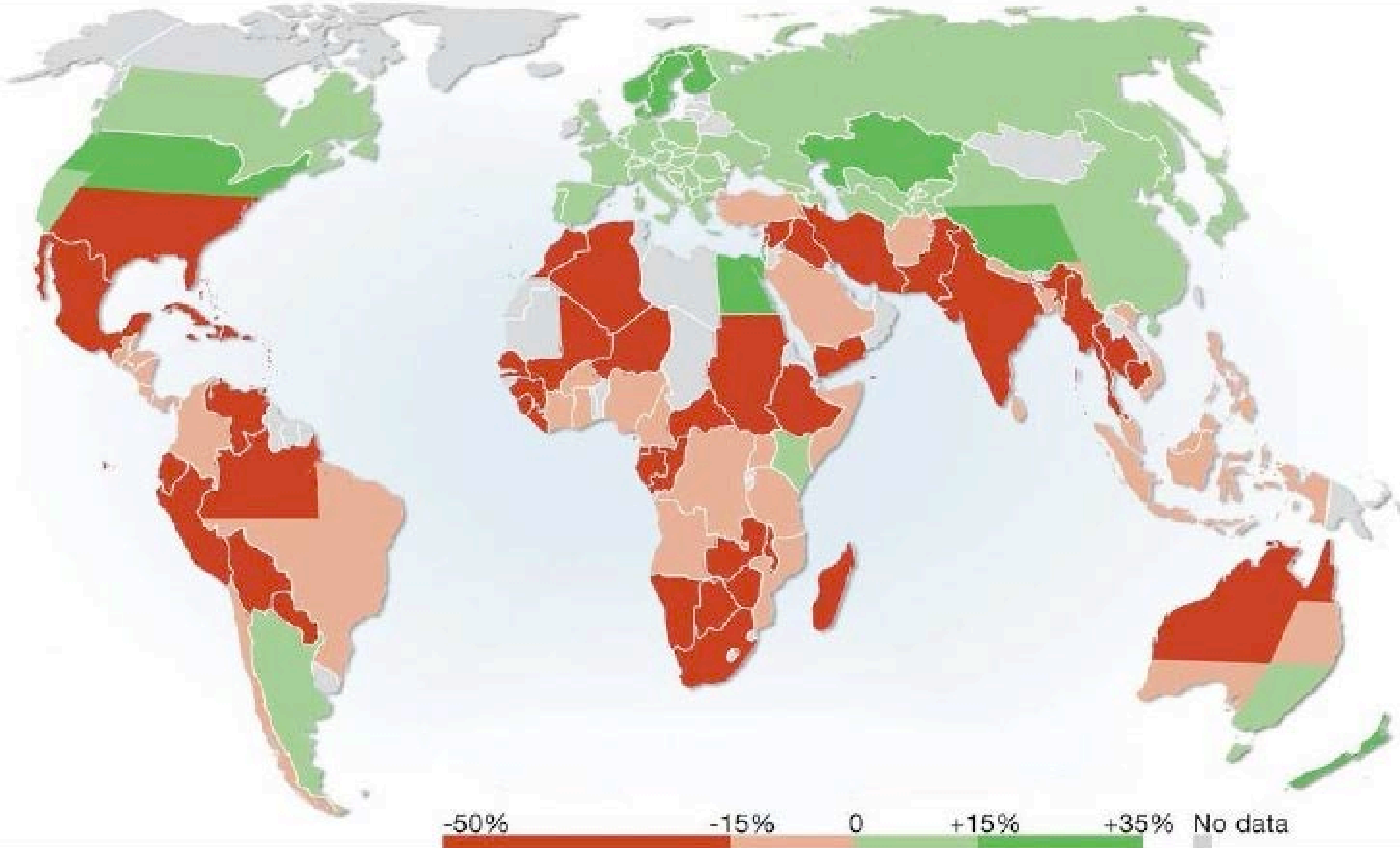


" A key culprit in climate change – carbon emissions – can also help agriculture by enhancing photosynthesis in many important (...) crops such as wheat, rice, and soybeans. The science, however, is far from certain on the benefits of carbon fertilisation."

This map represents the case of beneficial carbon fertilisation processes.

Source: Cline W., 2007, *Global Warming and Agriculture*.

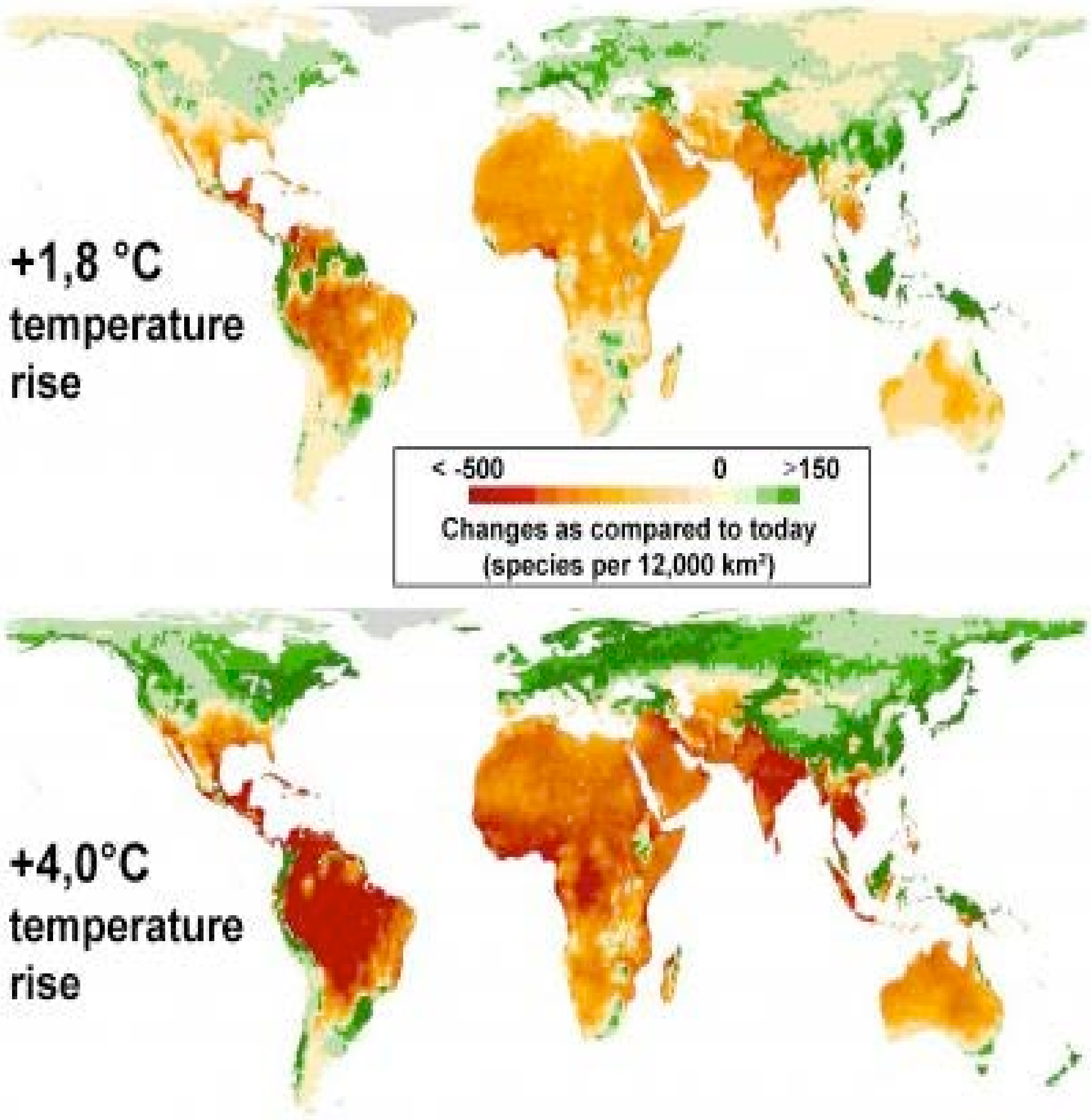
Climate Change and Food Security



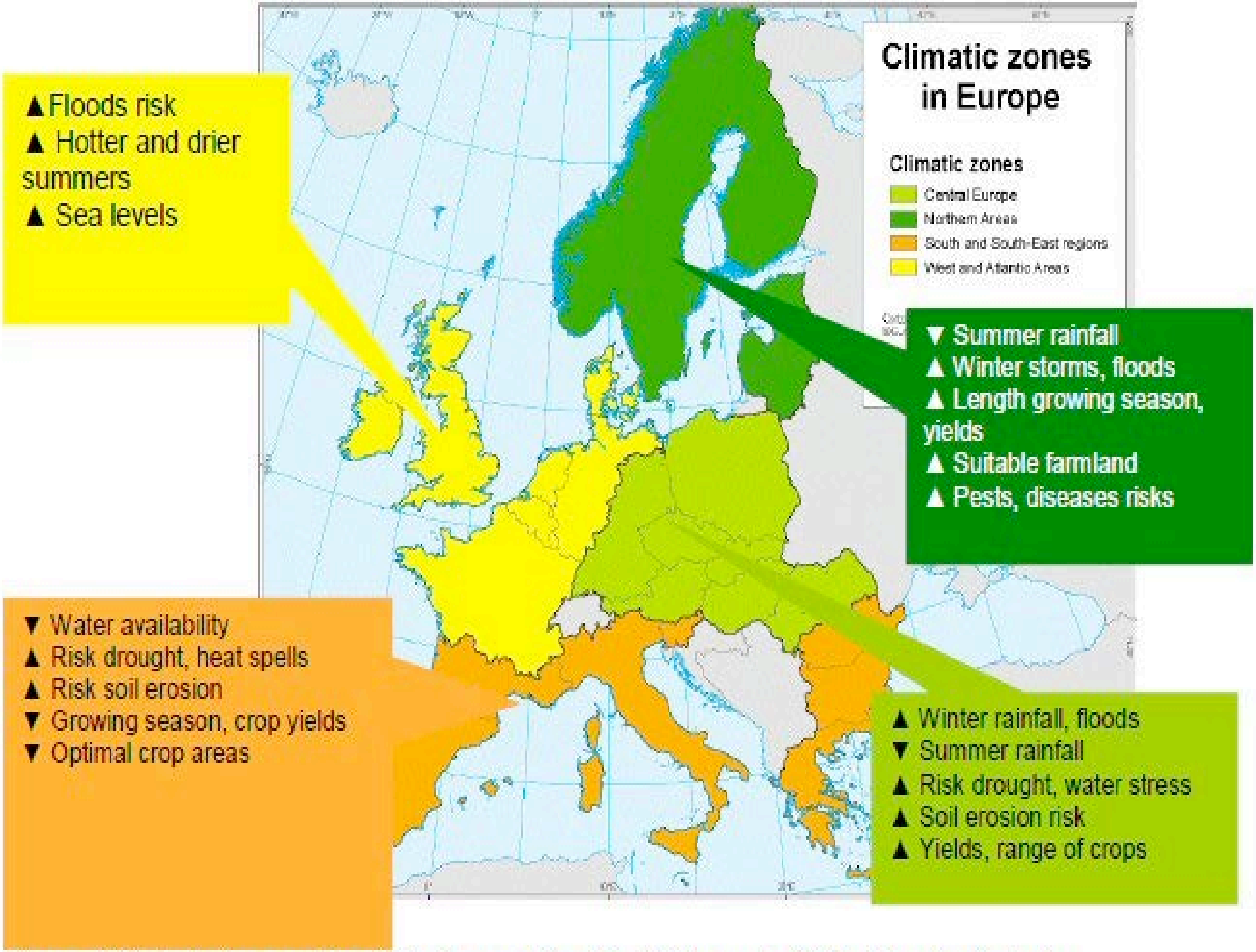
Source: Peterson Institute / UNEP / GRID-Arendal, 2007

Plant diversity and climate change

Possible changes in the climatic potential for plant species richness by 2100
as compared to today



Climate change – Possible impacts on EU agriculture



Source: DG Agriculture and Rural Development, based on EEA reports, JRC and academic studies

Farmers are educated people these days, they have to be . . . what people do not understand is that <u>farming is a incredible knowledge intensive endeavor</u>, we are trying to control the invariables of nature and produce crops on a sustainable and consisting basis and that takes a lot of knowledge . . .

http://www.youtube.com/watch?v=dlnrvkzEv9w

PNAS

Greenhouse gas mitigation by agricultural intensification

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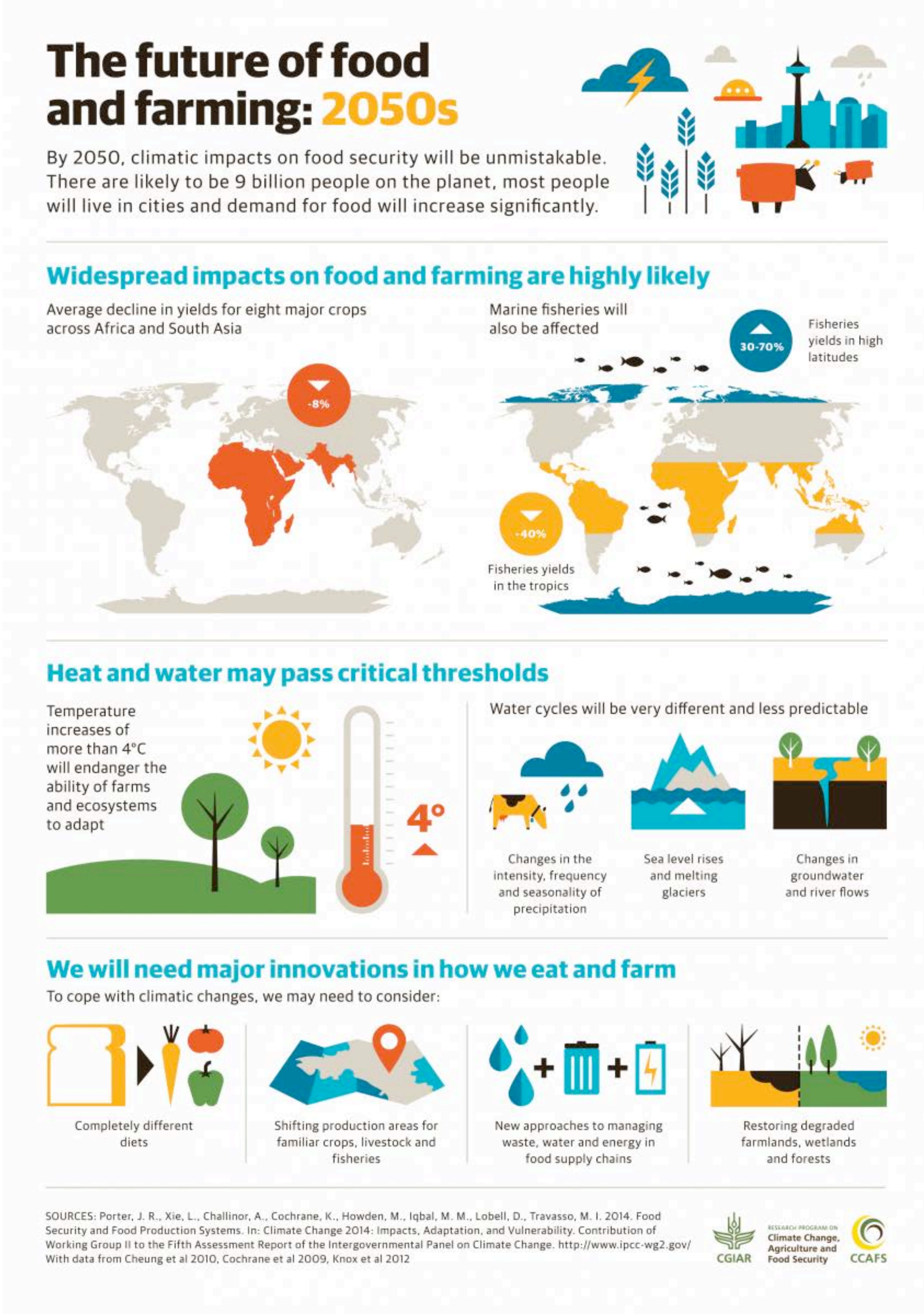
Edited by G. Philip Robertson, W. K. Kellogg Biological Station, Hickory Corners, MI, and accepted by the Editorial Board May 4, 2010 (received for review December 9, 2009)

As efforts to mitigate climate change increase, there is a need to identify cost-effective ways to avoid emissions of greenhouse gases (GHGs). Agriculture is rightly recognized as a source of considerable emissions, with concomitant opportunities for mitigation. Although future agricultural productivity is critical, as it will shape emissions from conversion of native landscapes to food and biofuel crops, investment in agricultural research is rarely mentioned as a mitigation strategy. Here we estimate the net effect on GHG emissions of historical agricultural intensification between 1961 and 2005. We find that while emissions from factors such as fertilizer production and application have increased, the net effect of higher yields has avoided emissions of up to 161 gigatons of carbon (GtC) (590 $GtCO_2e$) since 1961. We estimate that each dollar invested in agricultural yields has resulted in 68 fewer kgC (249 $kgCO_2e$) emissions relative to 1961 technology ($14.74/tC, or ~$4/tCO_2e), avoiding 3.6 GtC (13.1 $GtCO_2e$) per year. Our analysis indicates that investment in yield improvements compares favorably with other commonly proposed mitigation strategies. Further yield improvements should therefore be prominent among efforts to reduce future GHG emissions.

agriculture | greenhouse gas emissions | land use change | climate change mitigation | carbon price

GHG emissions; 1 GtC = 10^9 metric tons of carbon), including 0.76 GtC equivalent N_2O and 0.90 GtC equivalent CH_4 (58% and 47% of the anthropogenic total, respectively) (10). In the same year, land use change (e.g., harvesting of forest products and clearing for agriculture) accounted for an additional 1.5 GtC emissions (11). The main components of agricultural emissions outside of land use change are N_2O released from soils related to the application of nitrogenous fertilizer (38%), CH_4 from livestock enteric fermentation, and CH_4 and N_2O from manure management (38%), CH_4 from cultivation of rice (11%), and CH_4 and N_2O from burning of savannah, forest, and agricultural residues (13%) (12). Beyond these direct emissions sources, the agricultural sector drives emissions in the industrial and energy sectors through production of fertilizers and pesticides, production and operation of farm machinery, and on-farm energy use (13).

Important mitigation potential has been identified in each of these areas (10). In particular, it has been estimated that modified rice drainage and straw incorporation practices could reduce global CH_4 emissions from rice cultivation by up to 30% (14). Precision agriculture and nutrient budgeting can facilitate more efficient use of fertilizers and thus reduce emissions associated with excess application (6). Finally, much attention has been paid to conservation tillage and the potential for sequestration of soil organic carbon in agricultural systems, which can build fertility and



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CROPS

Switching to varieties tolerant to heat, drought or salinity

Optimising irrigation

Managing soil nutrients and erosion

LIVESTOCK

Matching animal numbers to changes in pastures

More farms that mix crops and livestocks

Controlling the spread of pests, weeds and diseases

FISHERIES

Switching to more abundant species

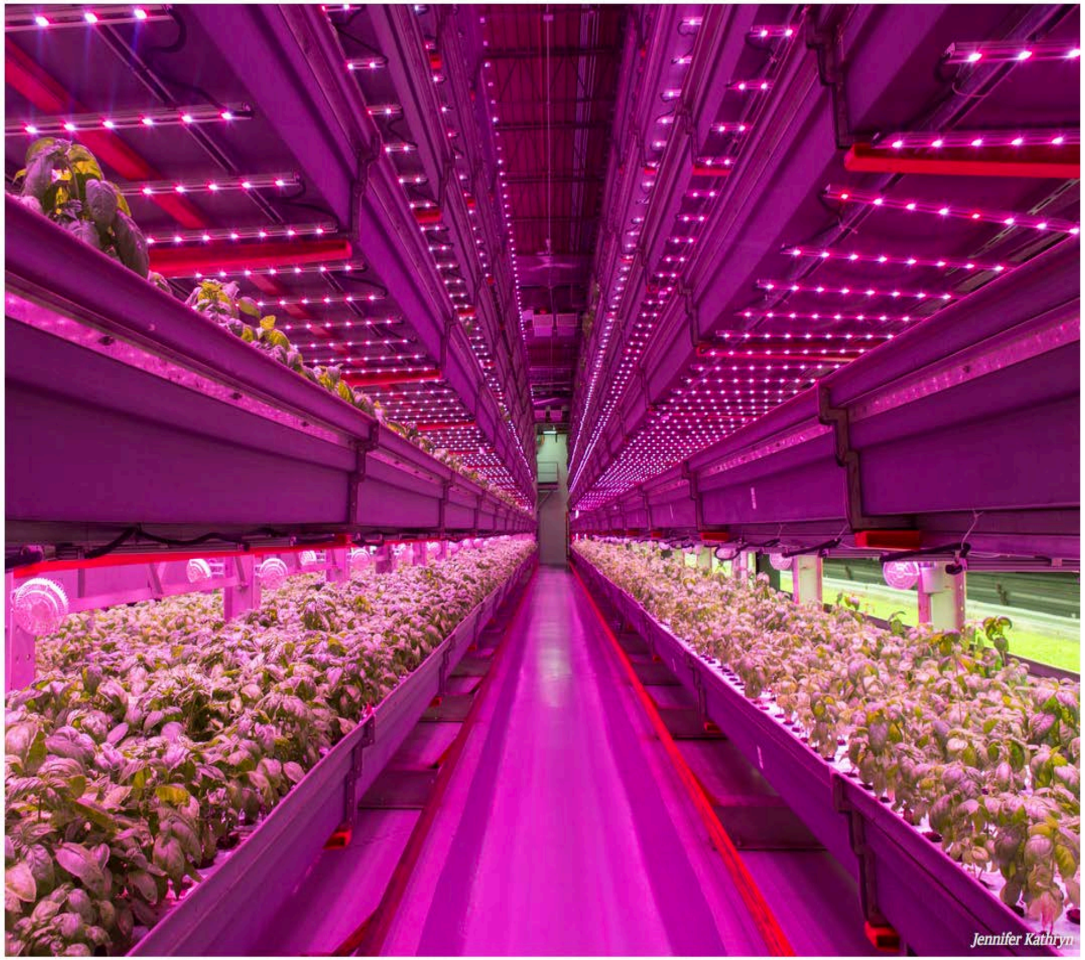
Restoring degraded habitats and breeding sites like mangroves

Strength-ening infrastruc-ture such as ports and landing sites

The future of agriculture is an indoor vertical farm half the size of a Wal-Mart

Chris Weller
Oct. 23, 2015, 11:30 AM 9,543 1

FACEBOOK | LINKEDIN | TWITTER | EMAIL | PRINT



http://bit.ly/1PLismp

The world's first robot-run farm will harvest 30,000 heads of lettuce daily

Leanna Garfield
Jan. 27, 2016, 1:00 PM 187,778 40

FACEBOOK | LINKEDIN | TWITTER | EMAIL | PRINT

The Japanese lettuce production company Spread believes the farmers of the future will be robots.

So much so that Spread is creating the world's first farm manned entirely by robots. Instead of relying on human farmers, the indoor Vegetable Factory will employ robots that can

http://bit.ly/1SbADZl

A manera de Conclusiones

1. Aumentar el presupuesto dedicado a la investigación pública agrícola
2. Aumentar el número de científicos en ciencias agrícolas.
3. Nuevas carreras en las Universidades
4. Desarrollar NUEVAS variedades para el CC.
5. Potenciar nuestro Sistema de Innovación Agraria (PNIA)
6. Educar/capacitar a los productores.

Muchas Gracias !!