

*Universidad San Salvador, Buenos Aires*

# **Nuevas Problemáticas Ambientales**

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***UNU-EHS-MRF-Cátedra Vulnerabilidad Social  
24 de Septiembre, 2009***

# **Contenido**

**¿Qué es el Cambio Ambiental Global?**

**¿Cómo afecta el GAC a América Latina en el siglo XXI?**

**¿Riesgos ambientales en el siglo XXI?:**

**Deterioro del suelo y DLDD**

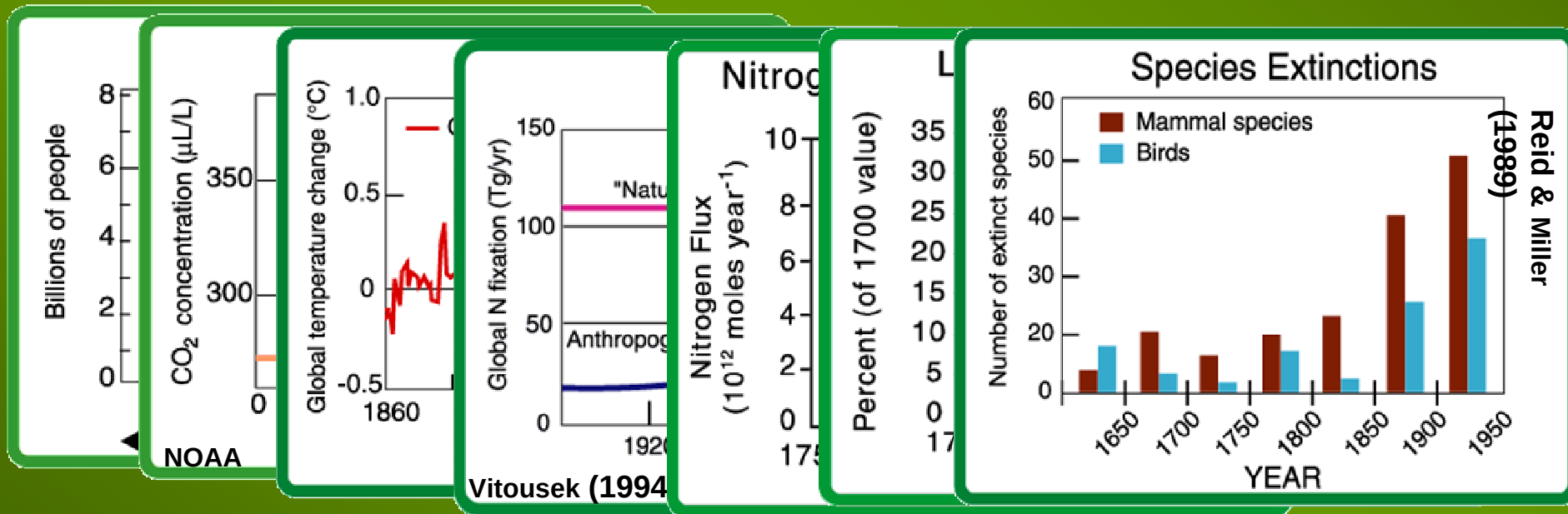
**Modelo PEISOR**

**Sequía y seguridad alimentaria**

**¿Cómo enfrentar el CAG en América Latina en el siglo XXI?**

# ¿Qué es cambio ambiental global: CAG?

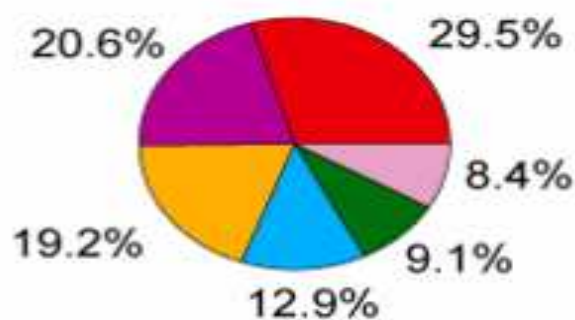
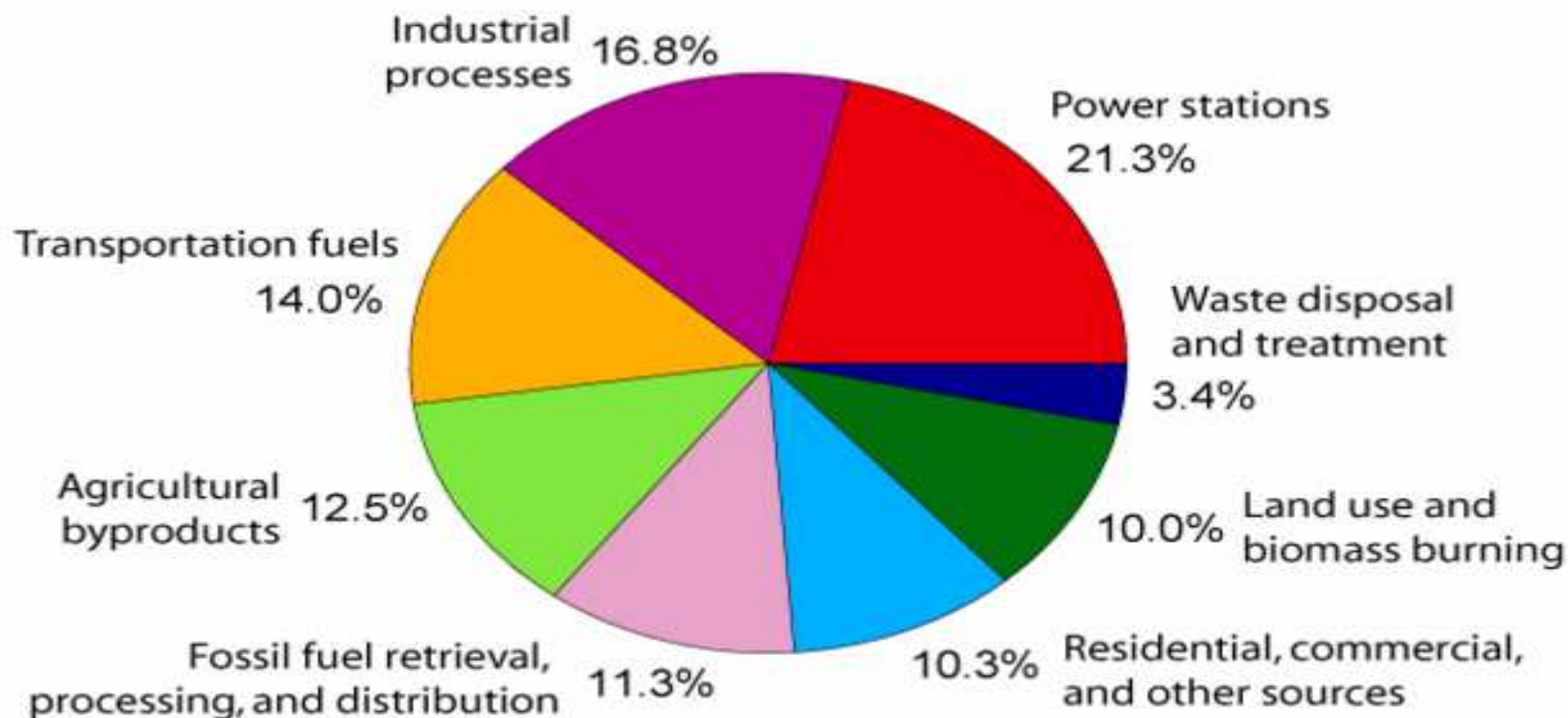
- Cambio global es más que cambio climático
- Cuenta con componentes naturales **más** los humanos
- Es un constelación de cambios en muchos dominios como:



# **CAC y sus efectos**

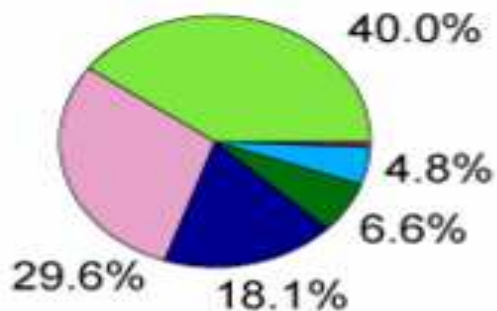
- 1. Aumento en la temperatura; ondas de calor y frío**
- 2. Aumento en el nivel del mar**
- 3. Tempestades e inundaciones**
- 4. Desertificación, pérdida de fertilidad de suelos y erosión**
- 5. Incendios forestales por sequía e inducidos**
- 6. Cambios irreversibles ambientales y destrucción de ecosistemas**
- 7. Afectación del bienestar, alimentación, producción, seguridad del agua y calidad de vida**
- 8. Aumento de migración de países pobres afectados**
- 9. Conflictos en zonas delicadas**
- 10. Posible cambios de gran dimensión (Amazonas, Corriente del Golfo, monzón en Asia, etc.)**

# Emisiones de Gases de Efecto Invernadero/Sector



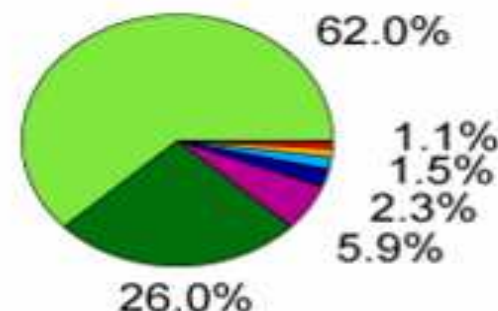
**Carbon Dioxide**

(72% of total)



**Methane**

(18% of total)



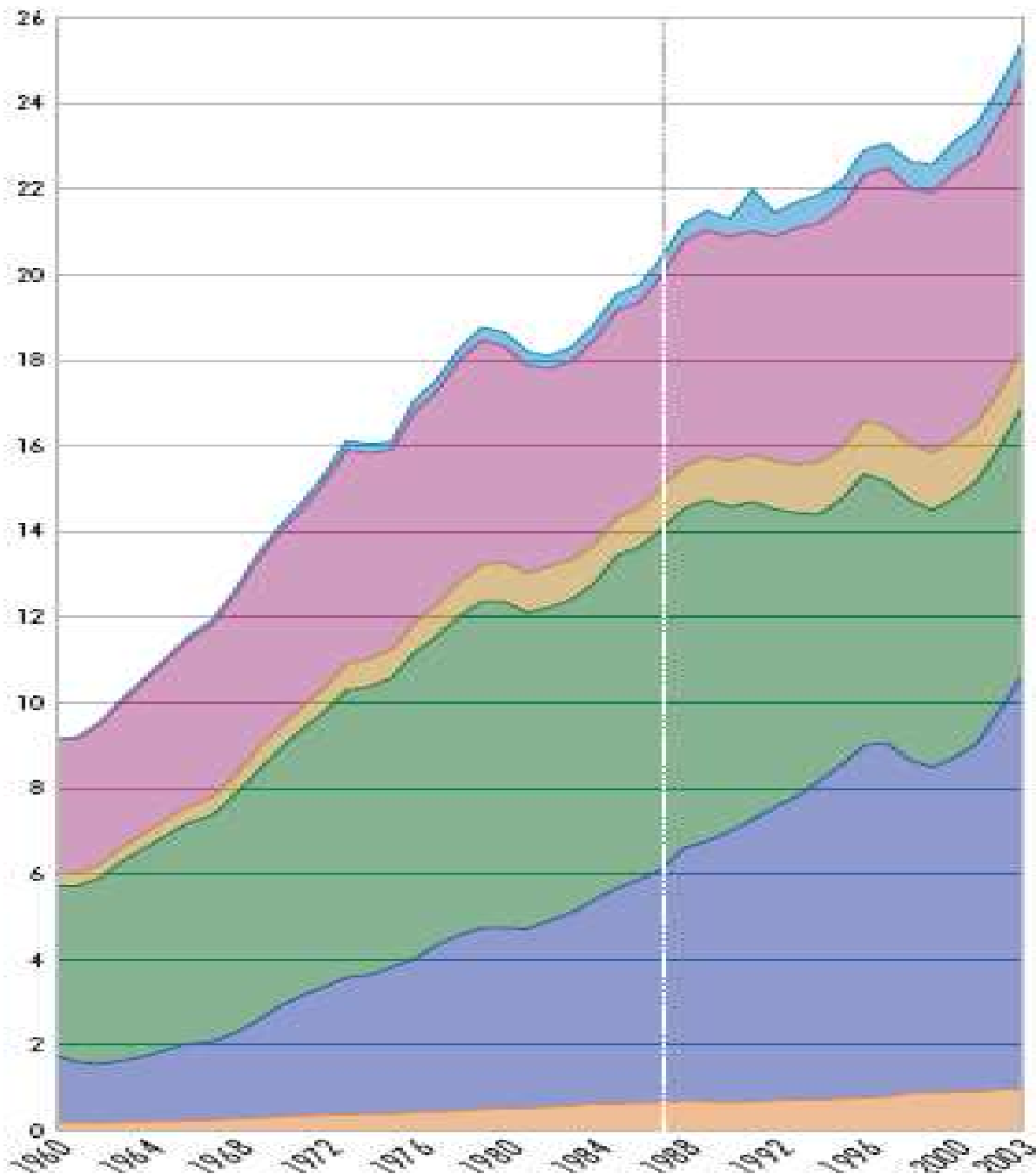
**Nitrous Oxide**

(9% of total)

# Emisiones fósiles de CO<sub>2</sub>/ región

- Africa
- Asia and the Pacific
- Europe
- Latin America and the Caribbean
- North America
- West Asia

Fuente: GEO 4, 2007: 60

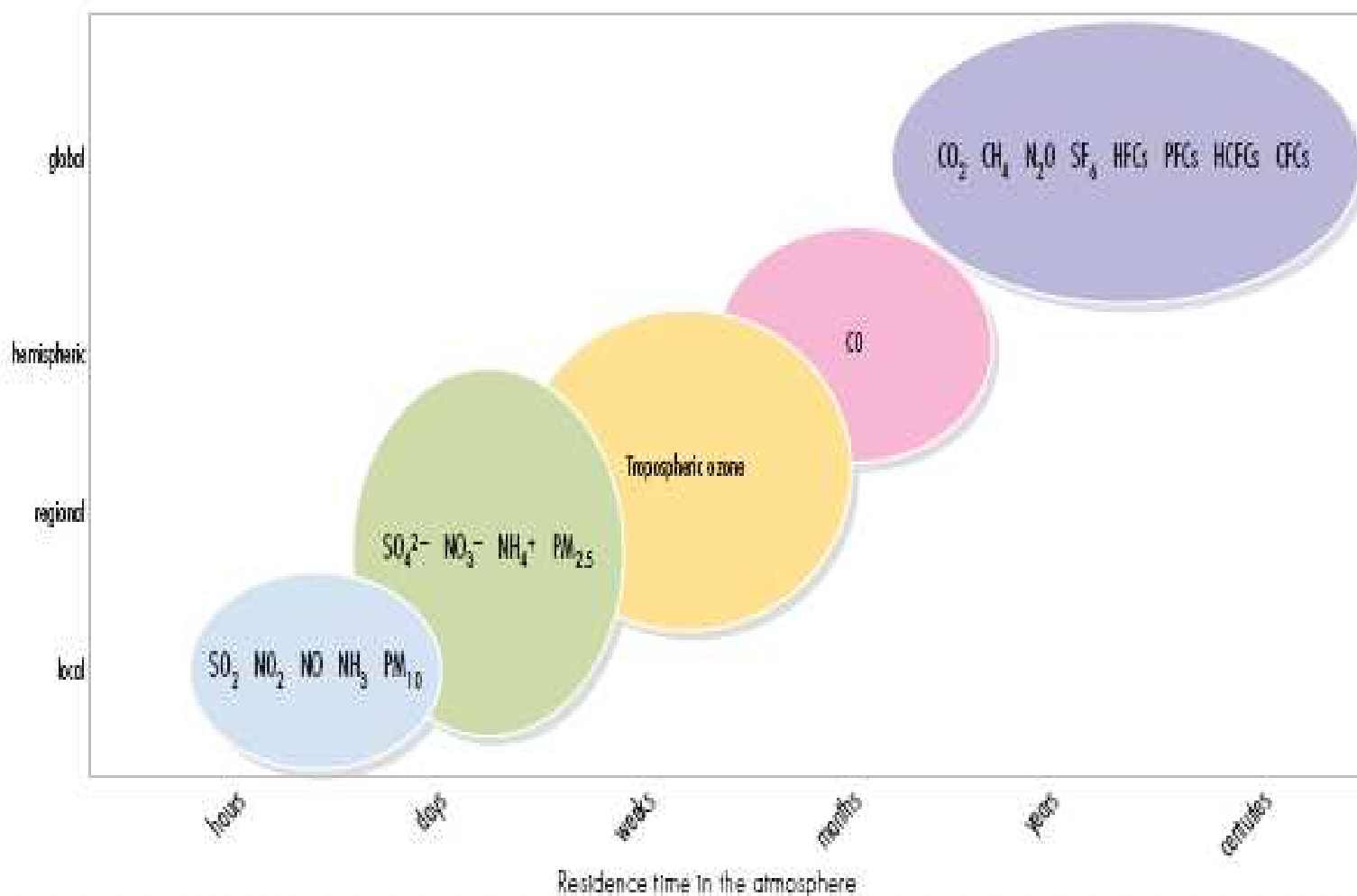


Source: GEO Data Portal,  
compiled from UNECCC-  
CDIAC 2006

# Tiempo de residencia de gases contaminantes

Figure 2.1 Selected pollutants, their average residence times in the atmosphere and maximum extent of their impact

Maximum scale of the problem

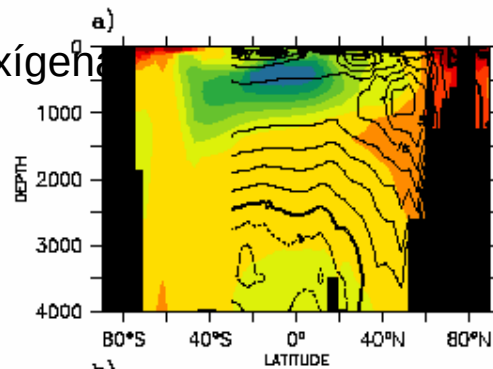


Source: EEA 1995, Centre for Airborne Organics 1997

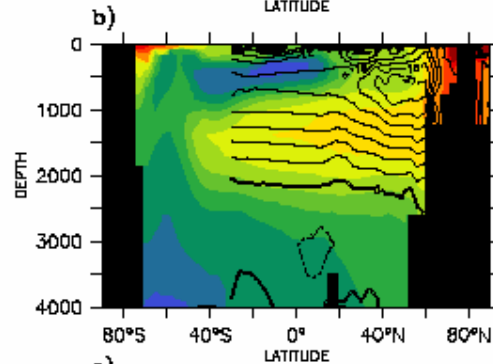
# Acidificación y Anoxia

Concentración de oxígeno  
en mMol/L

Hoy día

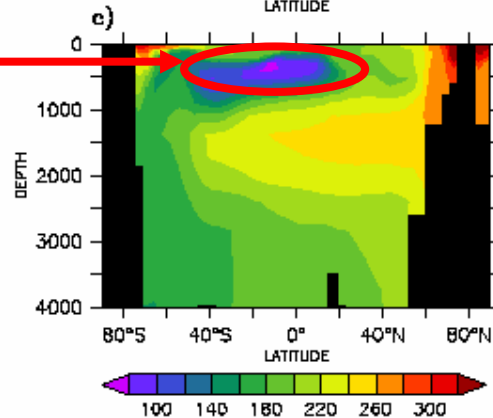


Año 3000  
sólo con CC

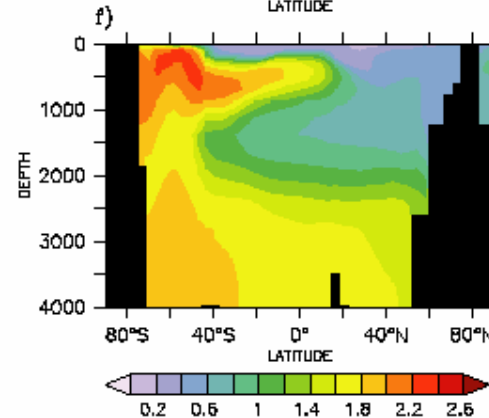
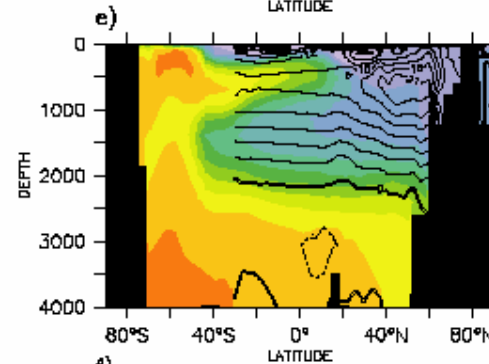
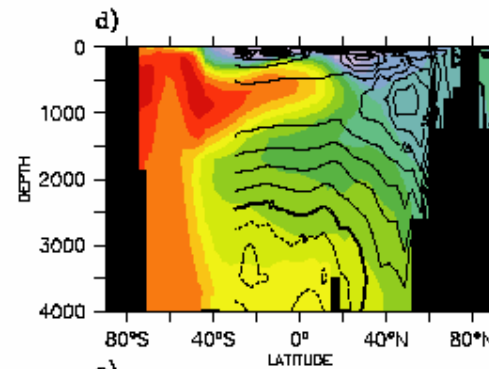


Hoyo de oxígeno

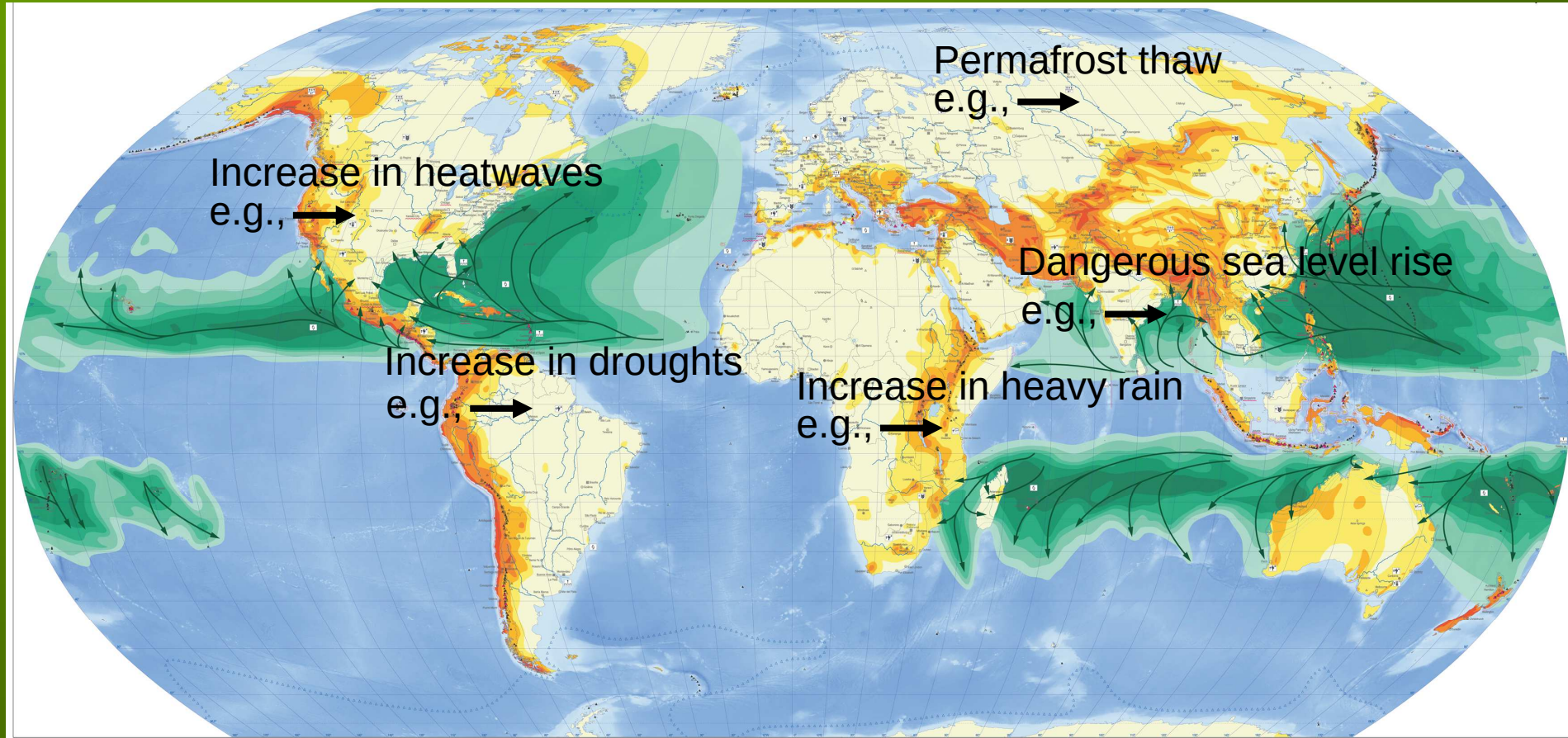
año 3000  
GAC



Concentración de fosfatos  
en mMol/L



# CAG y su impacto en regiones



## Earthquakes

|                 |
|-----------------|
| Zone 0: MM V    |
| Zone 1: MM VI   |
| Zone 2: MM VII  |
| Zone 3: MM VIII |
| Zone 4: MM IX   |

MM: modified Mercalli scale

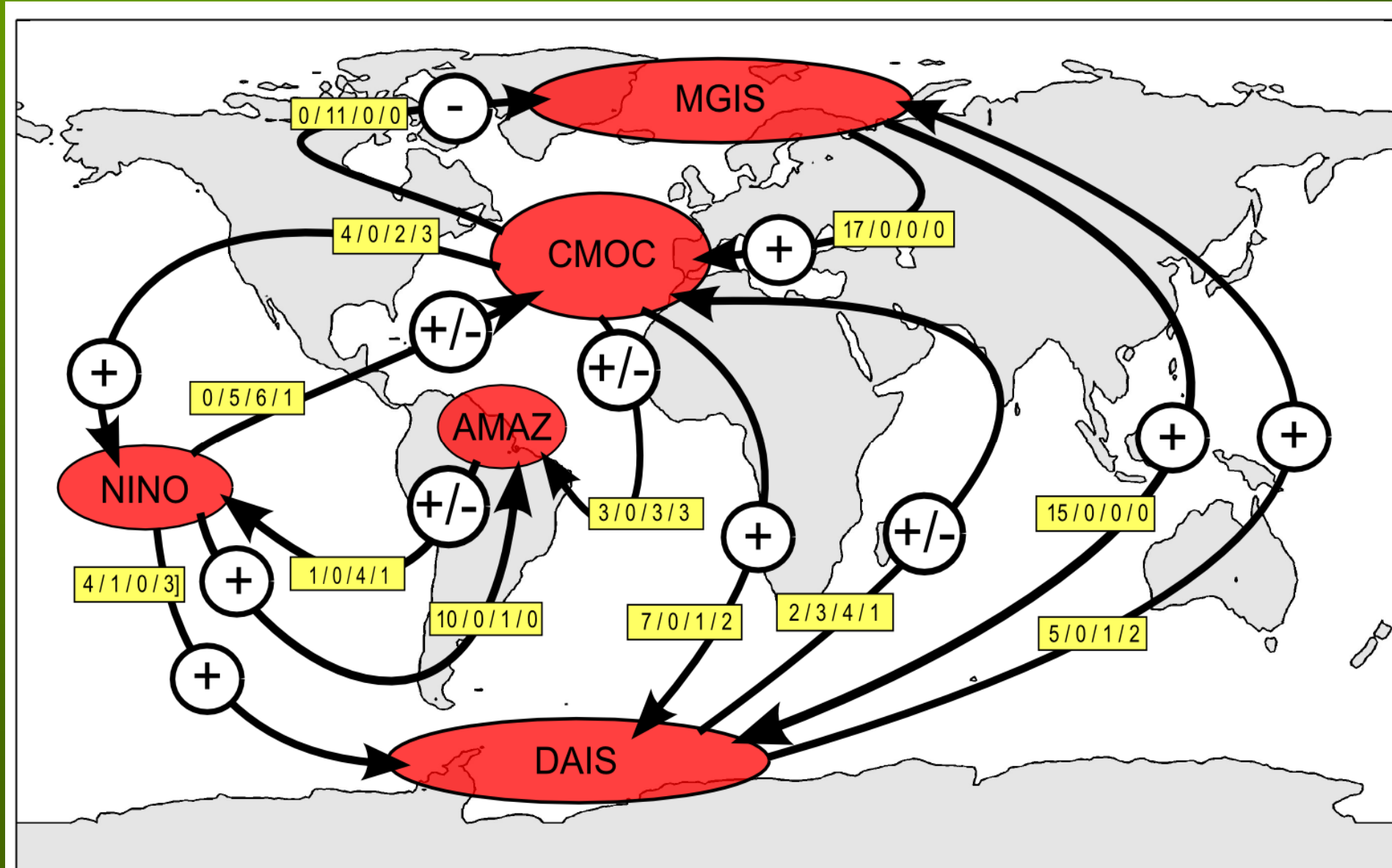
## Tropical Hurricanes

|                      |
|----------------------|
| Zone 0: 76–141 km/h  |
| Zone 1: 142–184 km/h |
| Zone 2: 185–212 km/h |
| Zone 3: 213–251 km/h |
| Zone 4: 252–299 km/h |
| Zone 5: ≥ 300 km/h   |

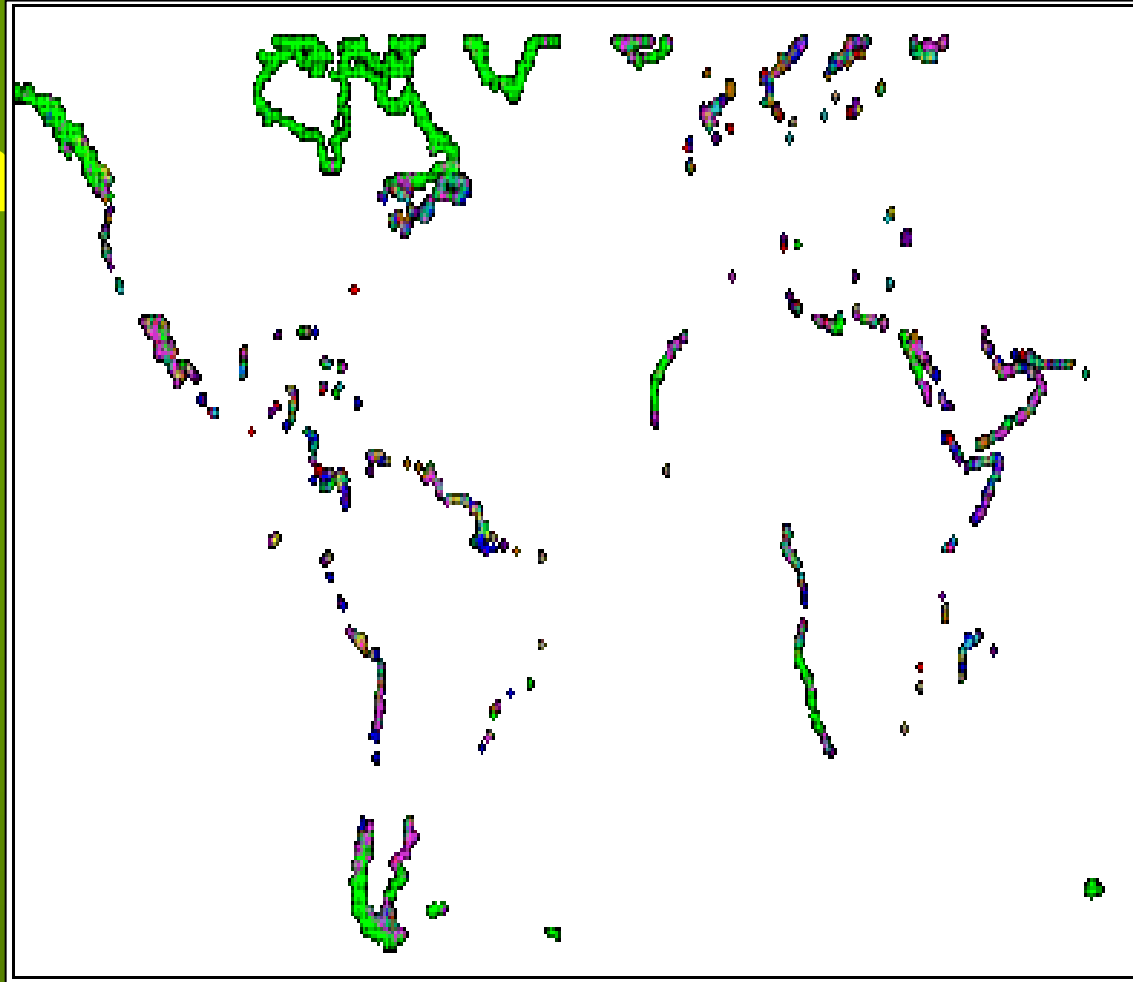


Münchener Rück  
Munich Re Group

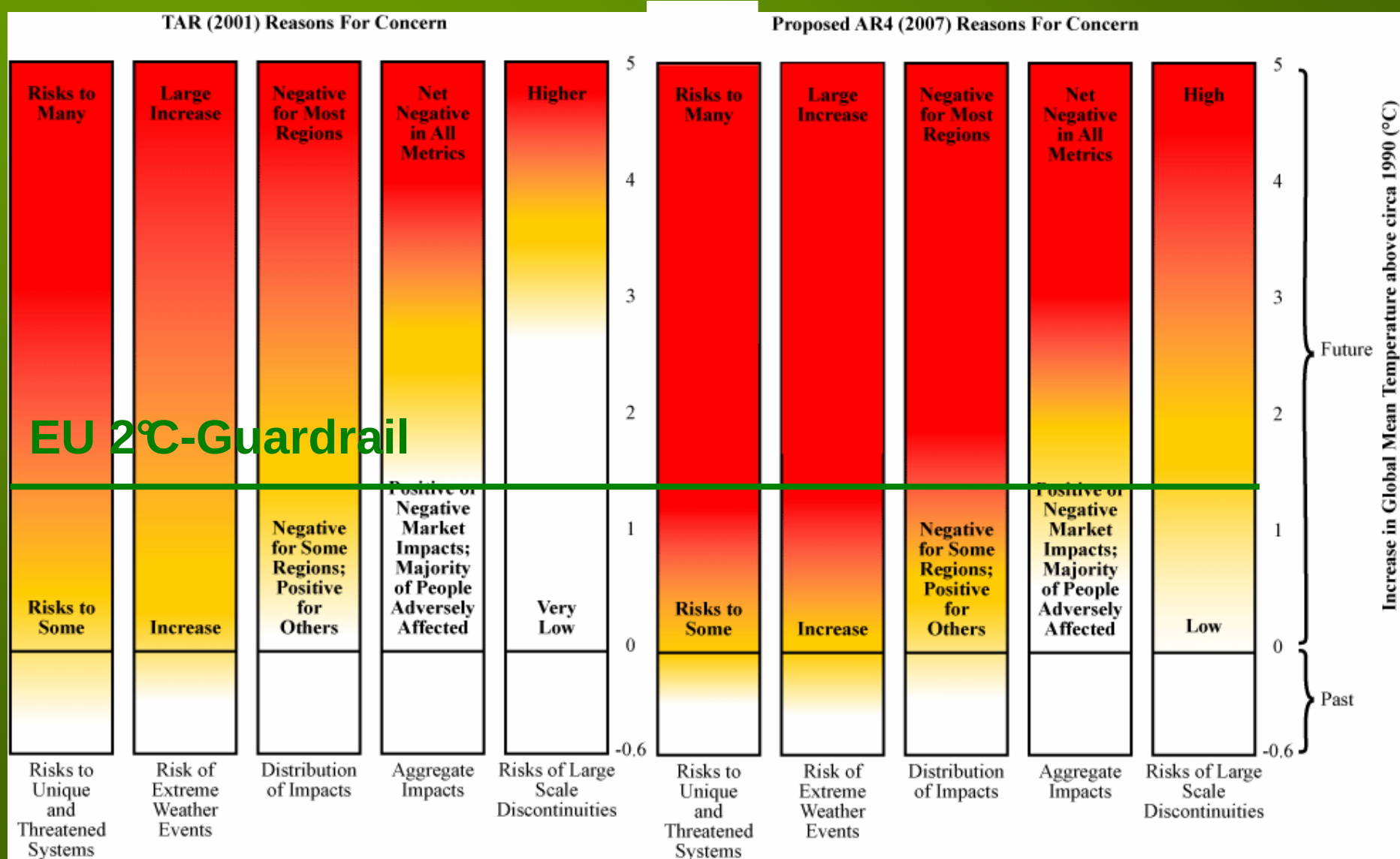
# Interdependencia entre puntos de ruptura



**Aumento en  
el nivel del  
mar afecta  
costas**



# Riesgos: Datos actualizados 2007



(Smith et al. 2009 PNAS)

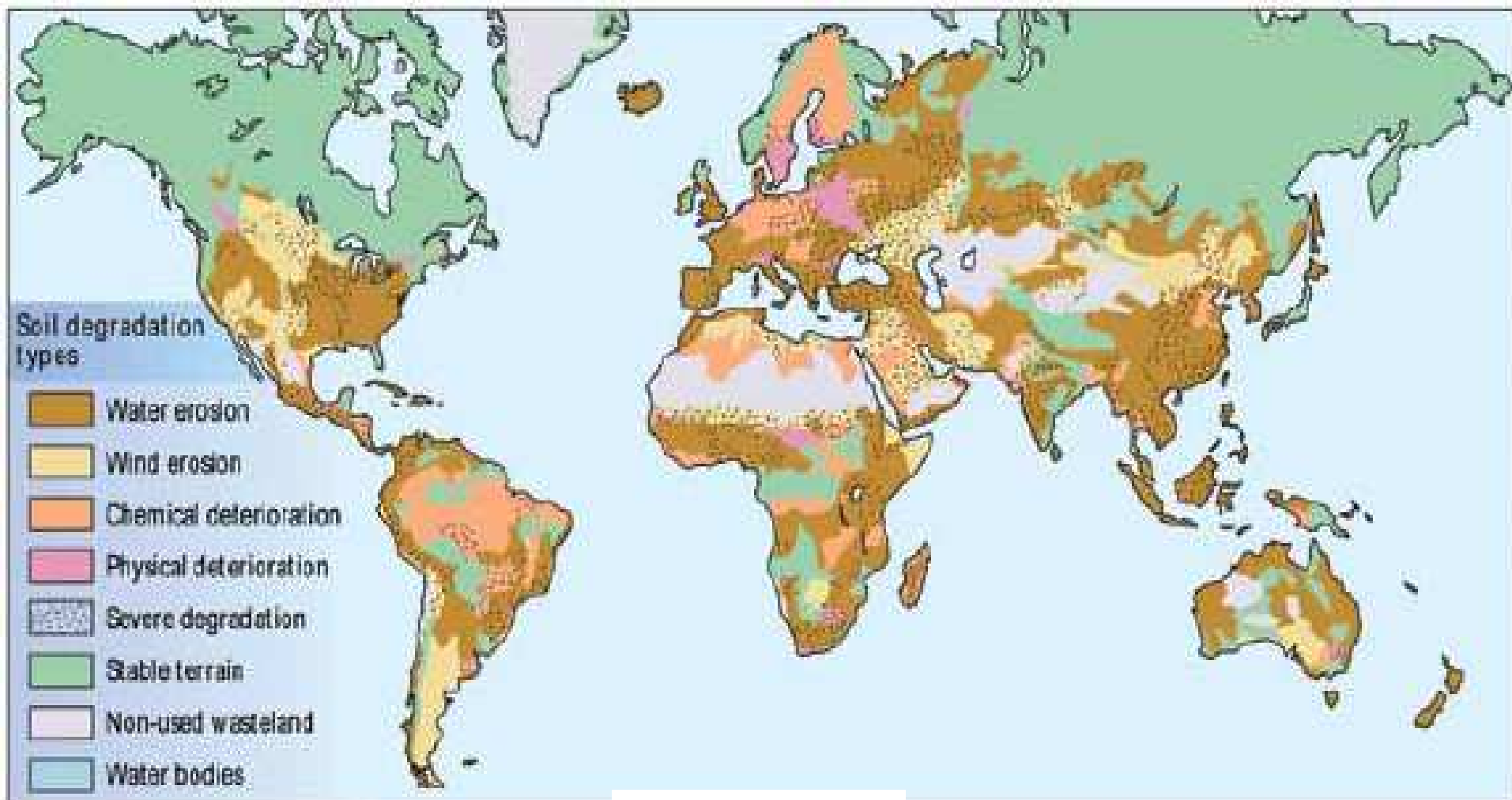
## Impactos asociados al aumento de temperatura entre 1980-1999

|             | 0                                                                                                                                                                                                                                                                                                                                                                                          | 1 | 2 | 3 | 4 | 5°C |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|-----|
| WATER       | Increased water availability in moist tropics and high latitudes<br>Decreasing water availability and increasing drought in mid-latitudes and semi-arid low latitudes<br>Hundreds of millions of people exposed to increased water stress                                                                                                                                                  |   |   |   |   |     |
| ECO-SYSTEMS | Increased coral bleaching    Most corals bleached    Widespread coral mortality<br><br>Terrestrial biosphere tends towards a net carbon source as:<br>15%                                  40% of ecosystems affected<br><br>Increasing species range shifts and wildfire risk<br><br>Ecosystem changes due to weakening of the meridional overturning circulation                         |   |   |   |   |     |
| FOOD        | Complex, localised negative impacts on small holders, subsistence farmers and fishers<br><br>Tendencies for cereal productivity to decrease in low latitudes                  Productivity of all cereals decreases in low latitudes<br><br>Tendencies for some cereal productivity to increase at mid- to high latitudes                  Cereal productivity to decrease in some regions |   |   |   |   |     |
| COASTS      | Increased damage from floods and storms<br><br><br>About 30% of global coastal wetlands lost<br><br>Millions more people experience coastal flooding each year                                                                                                                                                                                                                             |   |   |   |   |     |
| HEALTH      | Increasing burden from malnutrition, diarrhoeal, cardio-respiratory, infectious diseases<br>Increased morbidity and mortality from heat waves, floods, droughts<br>Changed distribution of some disease vectors                                                                                                                                                                            |   |   |   |   |     |

# **Deterioro del suelo y cambio climático (DLDD)**

- **Proceso de desertificación, degradación de suelos y sequías (DLDD): degradada 15% a 24% de superficie de Tierra.**
- **Círculo vicioso: DLDD, migración forzada, crisis políticas y conflictos amenazan seguridad nacional e internacional**
- **Agravados por:**
  - **pobreza (sobre-pastoreo y sobreuso de tierras)**
  - **Expansión agricultura comercial**
  - **Sobreexplotación acuíferos en tierras secas.**

# Destrucción del suelo



# Causas antropogénicas

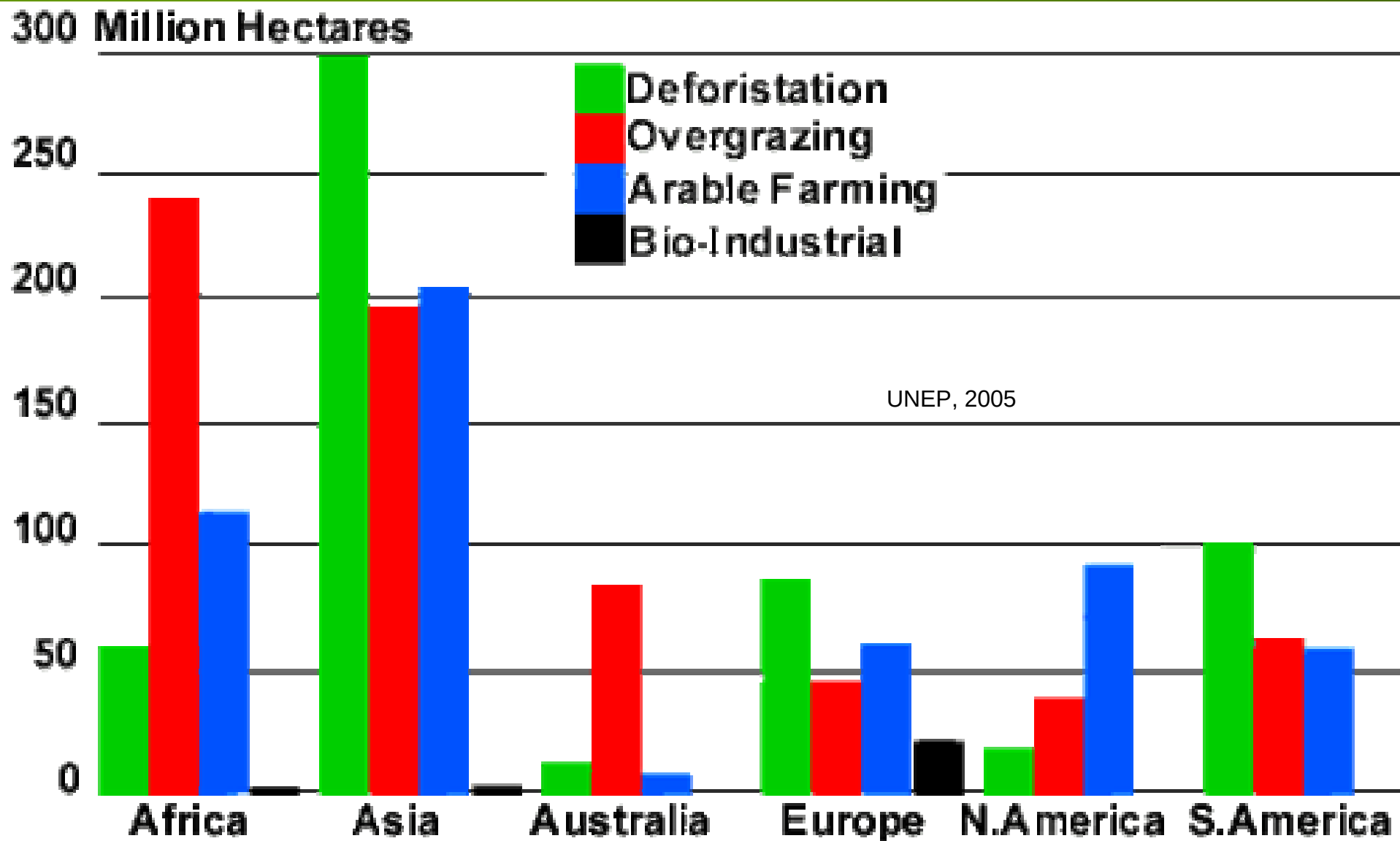
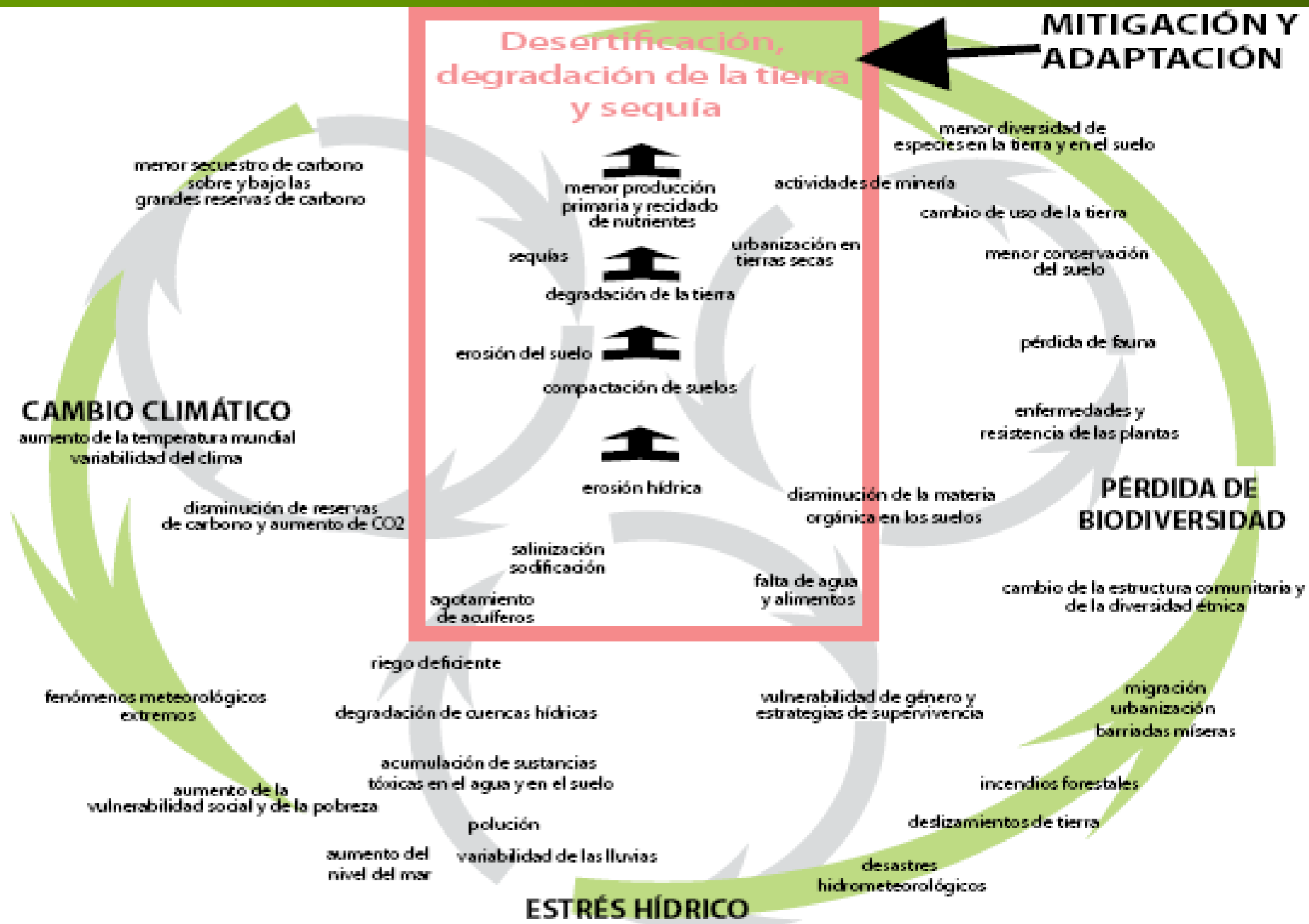


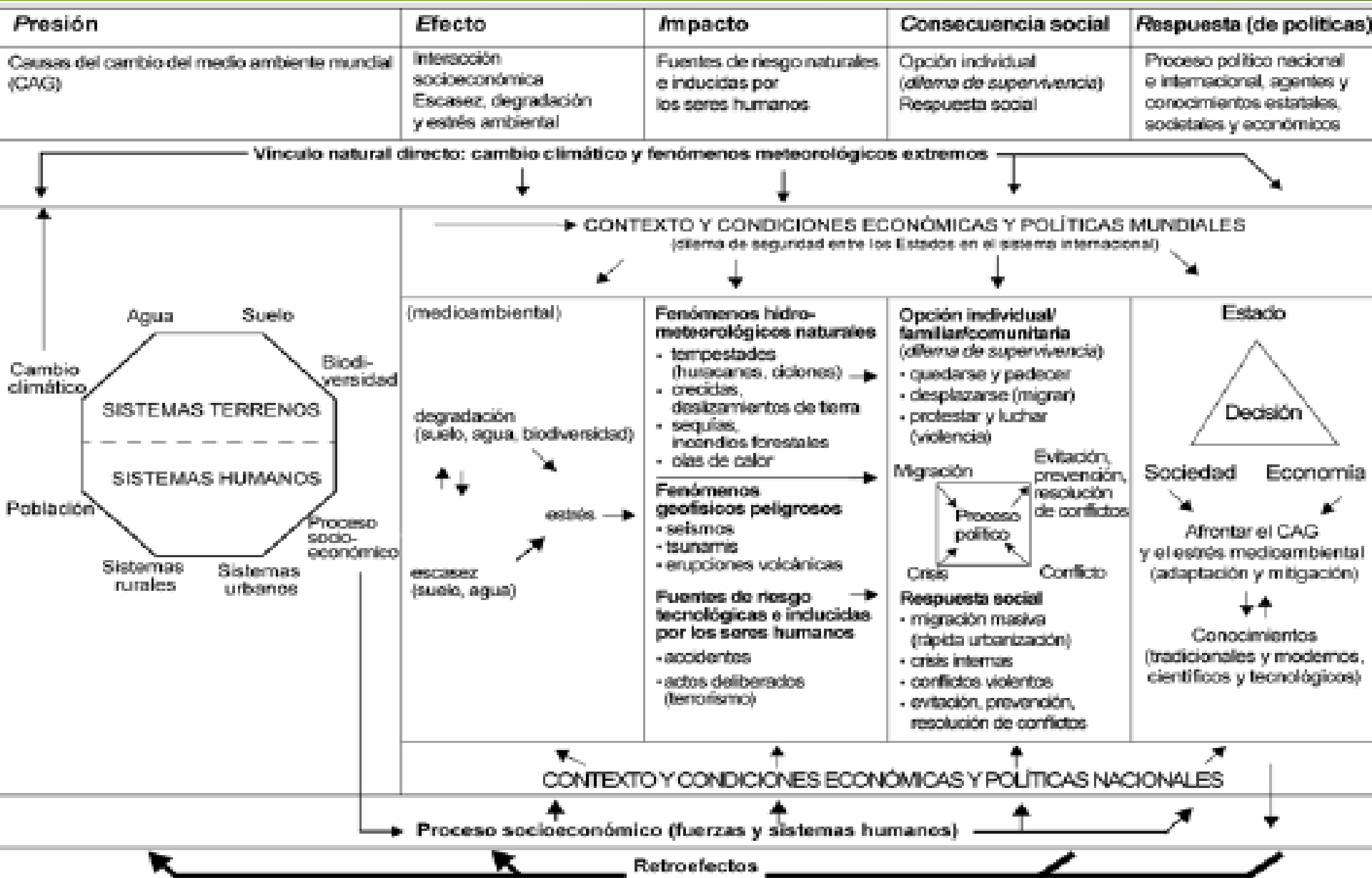
Figura 9  
Desertificación en la República Mexicana

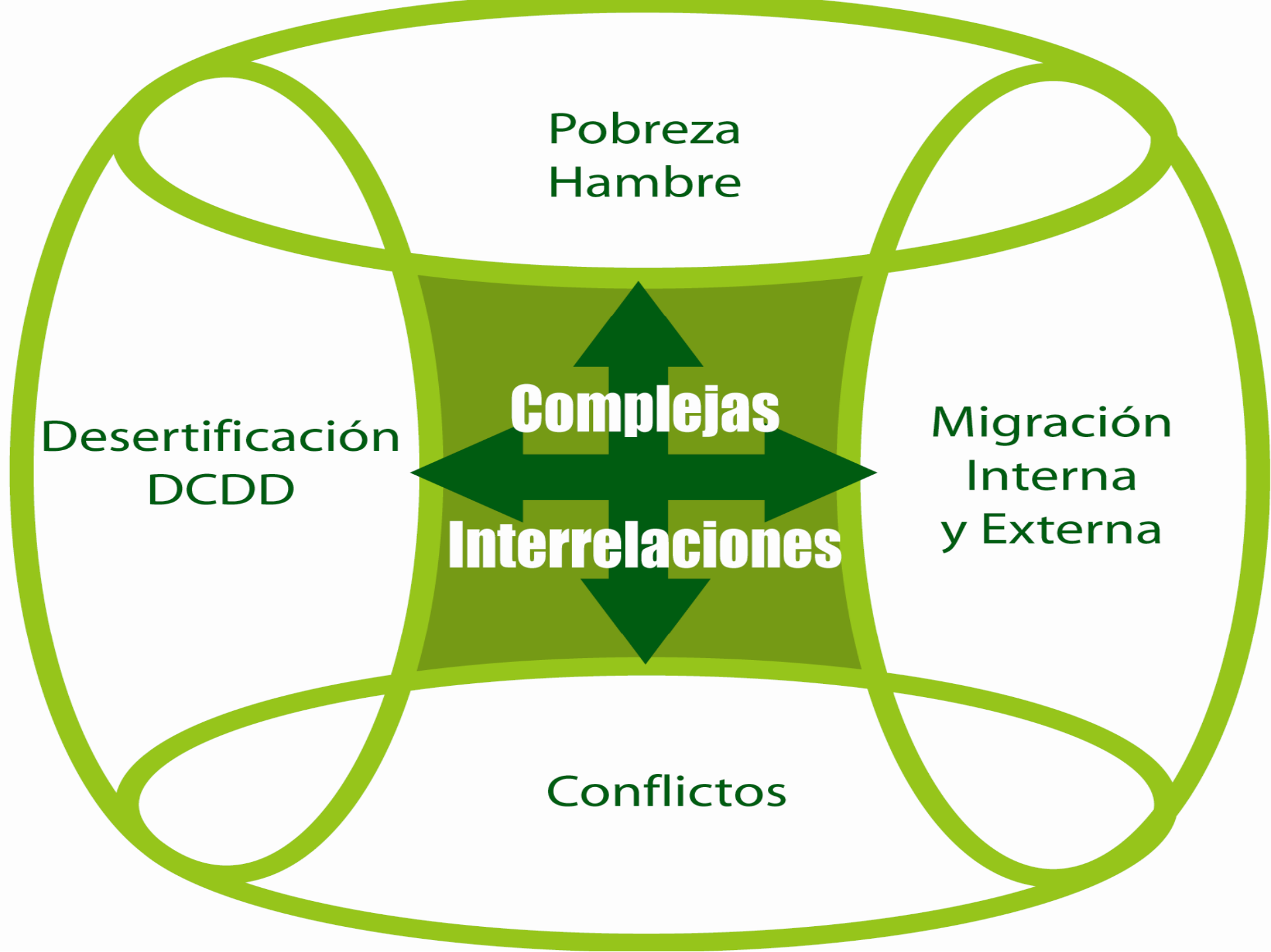


# Interrelación naturaleza-humanos



# Modelo PEISOR (Brauch/Oswald, 2009)





The image shows a wide, flat landscape under a bright, hazy sky. The ground is extremely dry, with a network of deep, dark cracks running across it. The soil is a mix of light brown and greyish tones, indicating a lack of moisture. In the distance, there are some low, dark, irregular shapes that could be rocks or small shrubs. The overall atmosphere is one of extreme aridity.

**Sequía**

# **Zonas Secas en el Mundo**

- Superficie de la tierra: **14.9 Millarden ha**
- UNEP: **6.1 mil millones de ha** son tierras secas;
- **1 mil millones de ha:** son zonas hiperáridas o desiertos
- Las tierras secas están amenazadas por **DLDD**
- **Una cuarta parte** de la población mundial depende de tierras secas.

# **Seguridad alimentaria y sequías**



# Catástrofes por sequía y afectación

| By the number of people killed on the country base |          |           | By the number of people affected on the country base |              |                    | By the economic damage on the country base |           |                       |
|----------------------------------------------------|----------|-----------|------------------------------------------------------|--------------|--------------------|--------------------------------------------|-----------|-----------------------|
| Country                                            | Date     | Killed    | Country                                              | Date         | Affected (million) | Country                                    | Date      | Damage in US\$ (1000) |
| China P.R.                                         | 1928     | 3,000,000 | India                                                | 1982         | 300                | China P.R.                                 | Jan 1984  | 13,755,200            |
| Bangladesh                                         | 1943     | 1,900,000 | India                                                | 2002         | 300                | Australia                                  | 1991      | 6,000,000             |
| India                                              | 1942     | 1,500,000 | India                                                | 1972         | 200                | Spain                                      | Sep. 1990 | 4,500,000             |
| India                                              | 1965     | 1,500,000 | India                                                | 1965         | 100                | Iran                                       | Apr.1999  | 3,300,000             |
| India                                              | 1900     | 1,250,000 | India                                                | Jun 82       | 100                | US                                         | July 2002 | 3,300,000             |
| Sov. Union                                         | 1921     | 1,200,000 | China P.R.                                           | Jun 94       | 82                 | Spain                                      | Apr. 1999 | 3,200,000             |
| China P.R.                                         | 1920     | 500,000   | China P.R.                                           | April 2002   | 60                 | Canada                                     | Jan 1977  | 3,000,000             |
| Ethiopia                                           | May 83   | 300,000   | India                                                | April 2000   | 50                 | China P.R.                                 | May 2006  | 2,910,000             |
| Sudan                                              | April 83 | 150,000   | China P.R.                                           | June 1988    | 49                 | Zimbabwe                                   | Oct. 1982 | 2,500,000             |
| Ethiopia                                           | Dec 73   | 100,000   | China P.R.                                           | January 2003 | 48                 | Brazil                                     | 1978      | 2,300,000             |

# Protestas por aumento en alimentos

## UNREST OVER FOOD

This map records some of the worst recent violence – where people died or large numbers protested – wholly or partly in response to rising food prices. Other, lesser outbreaks occurred in West Africa. Even Wal-Mart in the United States rationed rice and Italian consumers protested over the price of pasta.

**MEXICO**  
Jan 2007: 75,000 protest against a 400% rise in tortilla prices.

**HONDURAS**  
Apr 2008: Thousands of activists, students and farmers block highways and rally against high food prices and free trade.

**PERU**  
Feb 2008: Farmers strike. May 2008: 1,000 women hang pots outside Congress. Jul 2008: One-day national strike.

**HAITI**  
Apr 2008: Food price riots leave 4 dead. Prime minister sacked. Aug 2008: More violence erupts.

**MOROCCO**  
300 injured in bread protests.

**SENEGAL**  
Apr 2008: 1,000 march; many with empty rice sacks.

**GUINEA**  
Jan 2007: 130 killed in 16-day national strike.

**ARGENTINA**  
Mar-Apr 2008: 3-week farmers' strike over new export taxes on soy and other products.

**SOUTH AFRICA**  
Aug 2008: National day of protest and strikes. 25,000 march through Johannesburg.

**MAURITANIA**  
Nov. 2007: 1 killed in riots. May 2008: More violence; president sacks govt over slow response. Aug 2008: Coup ousts president.

**EGYPT**  
Apr 2008: 2 die in major bread riots; army is ordered to start baking bread.

**CAMEROON**  
Feb 2008: Riots leave 24 dead.

**YEMEN**  
Sep 2007: Tanks called in, 4 killed, in 5-day riots over wheat prices.

**SOMALIA**  
May 2008: 10s of 1,000s protest at doubling of food prices; 2 killed.

**MOZAMBIQUE**  
Feb 2007: 8 killed in food and fuel protests.

**UZBEKISTAN**  
Sep 2007: Food protests erupt in the capital, Tashkent, and the Fergana region.

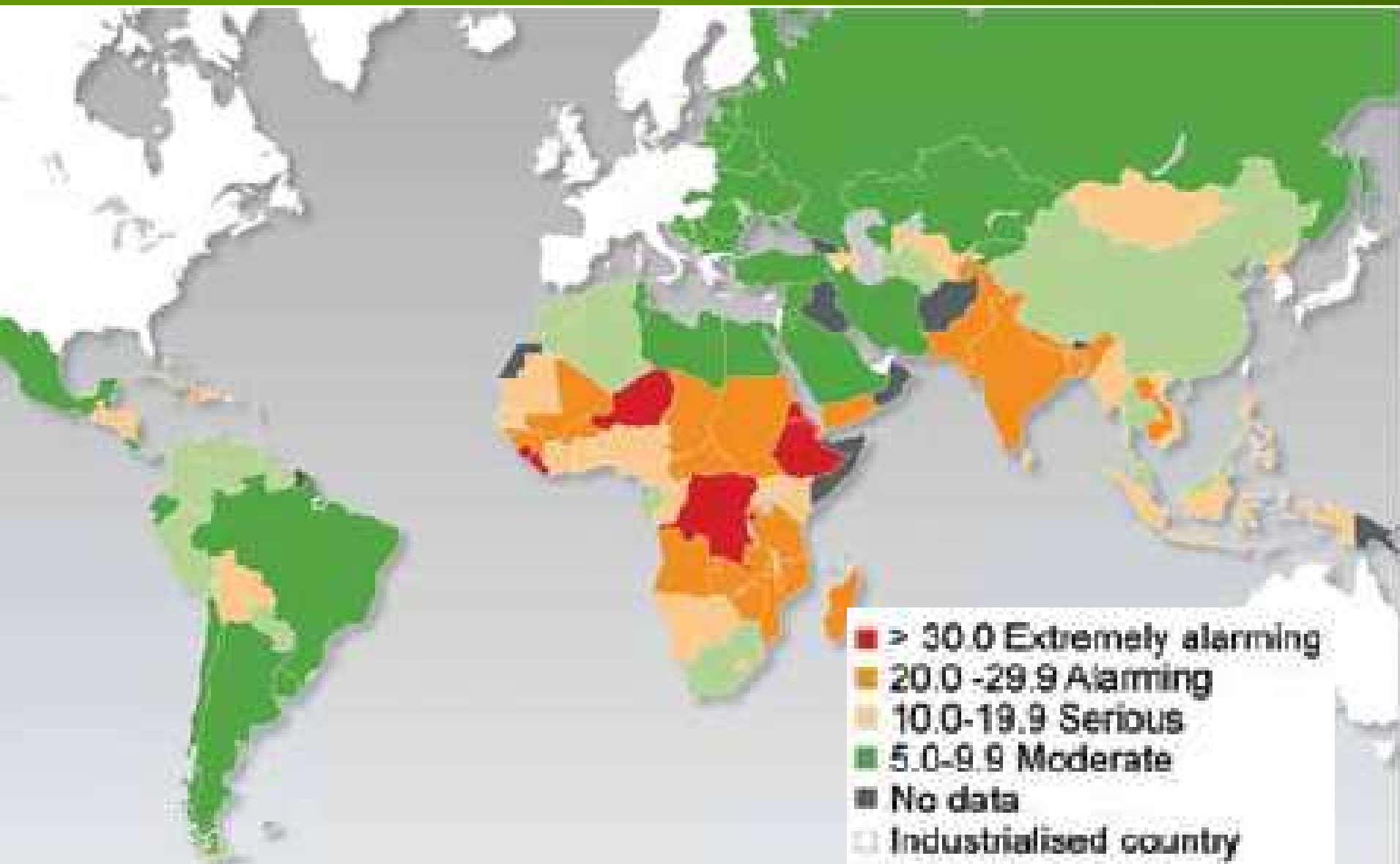
**INDIA**  
Sep 2007: At least 6 die in mob attacks on West Bengali rice sellers in rationing protests. Aug 2008: Food riots follow flooding in eastern India.

**BANGLADESH**  
Apr 2008: 20,000 textile workers riot over wages and food prices.

**INDONESIA**  
Jan 2008: 3,000 rally in Jakarta to demand action on soybean price, which doubled in a year.

Source: Al Jazeera, Antara News, AP, BBC, Bloomberg, Institute for War and Peace Reporting, International Business Times online, New York Times, Reuters, The Times (South Africa)

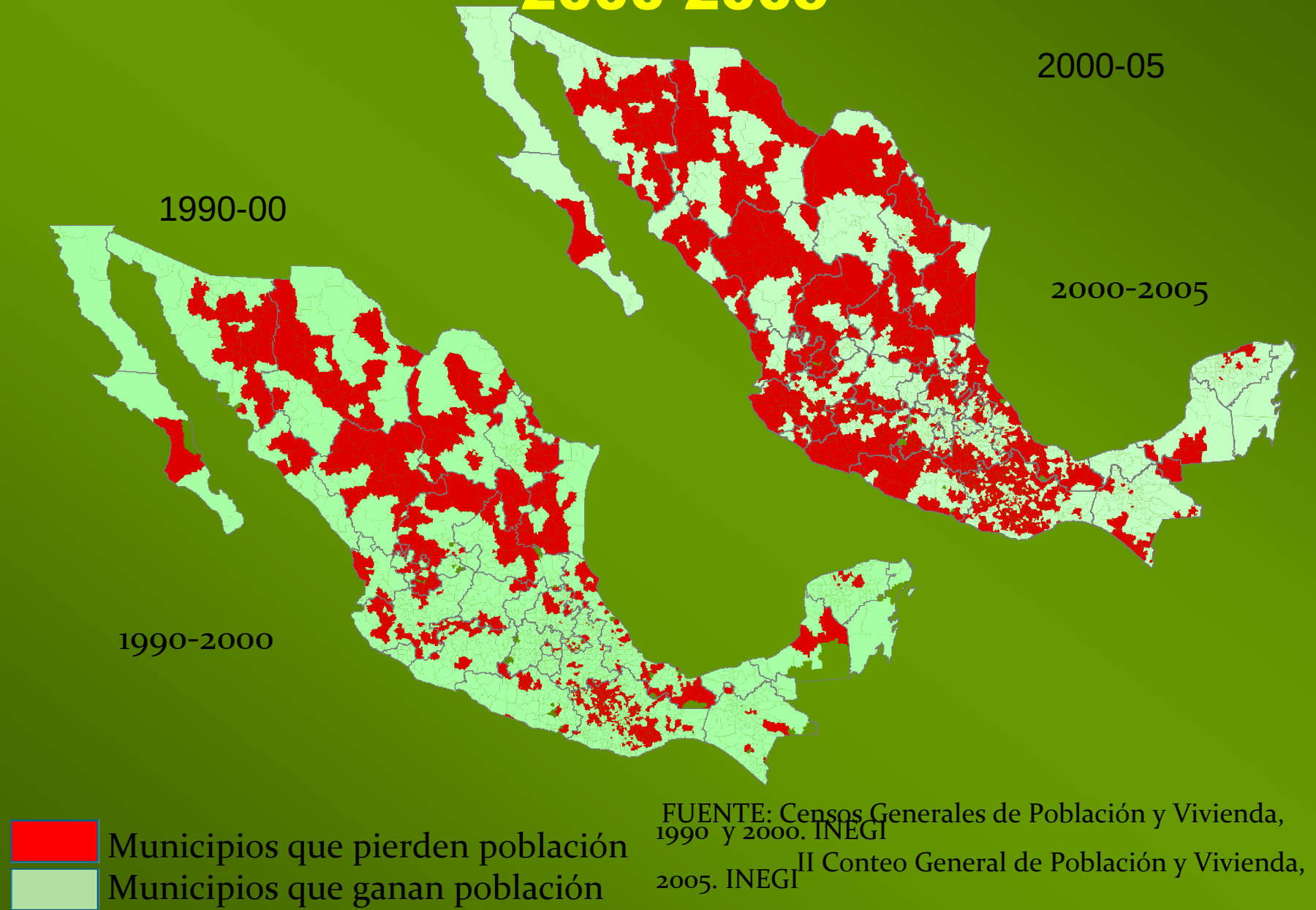
# Índice del hambre: IFPRI, 2008



# Inseguridad humana y migración



# Migración y despoblamiento: 1990-2000 y 2000-2005





**Pérdida de la biodiversidad**

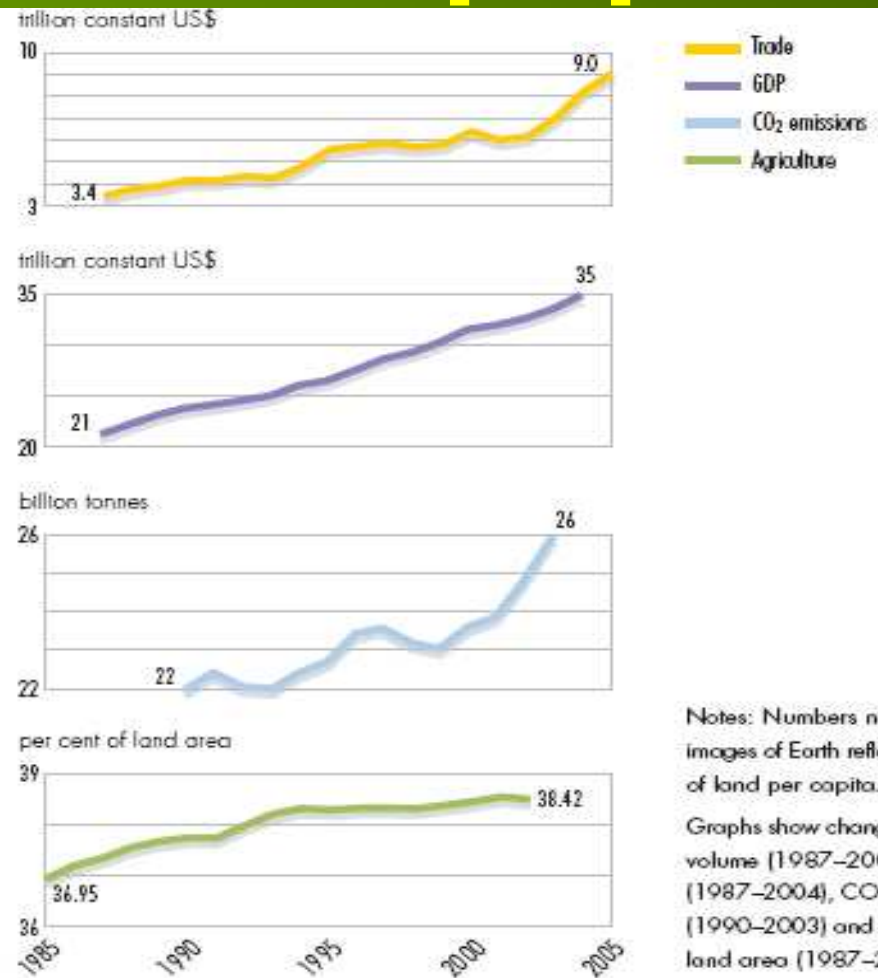
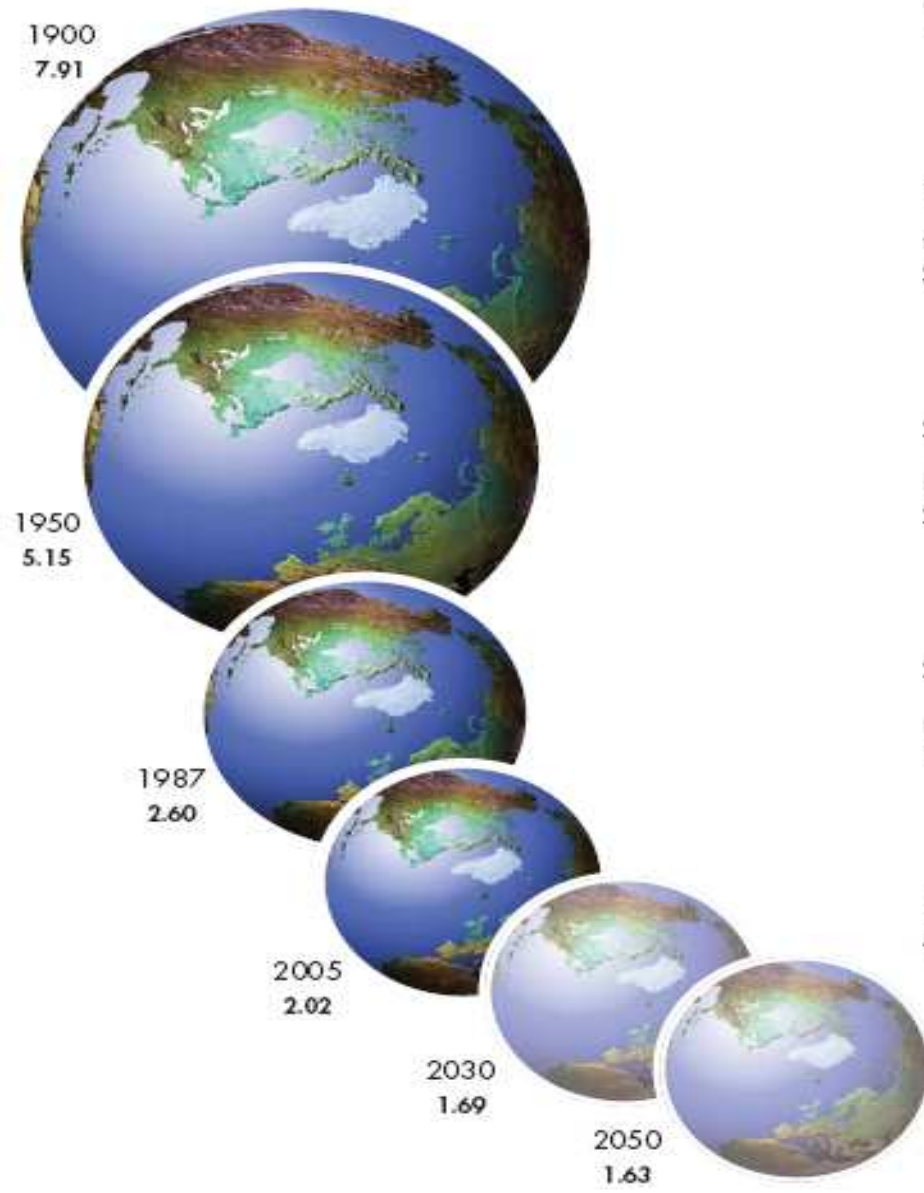
A photograph of a massive glacier, likely Perito Moreno, with a large, jagged rocky outcrop in the foreground. The glacier is a deep blue color, and the sky is a pale blue. The text is overlaid on the lower half of the image.

**¿Cómo enfrentar el CAG en  
América Latina en el siglo XXI?**

# Políticas de Adaptación/ Mitigamiento ante Amenazas Socio-Ambientales

| Estrategias y políticas de manejo                                                    | Amenazas                                                                                                               | Desafíos                                                                                 | Vulnerabilidades                                                                              | Riesgos                                                                |
|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
|                                                                                      |                                                                                                                        |                                                                                          |                                                                                               |                                                                        |
| Metas y políticas de sustentabilidad                                                 | - clima (aire), agua, suelos, biodiversidad                                                                            | - agricultura y soberanía alimentaria                                                    | - vulnerables (mejoramiento condiciones de mujeres, niños, ancianos, indígenas, minusválidos) |                                                                        |
| Política Ambiental (acuerdos, regímenes, normas, leyes, convenios, cultura)          | - cambio climático<br>- desertificación, erosión, pérdida fertilidad suelos<br>- escasez/ contamin. agua               | - economía<br>- agricultura<br>- turismo<br>- salud                                      | - bienestar rural<br>-hábitat urbano<br>- infraestructura<br>- transporte                     | - mejorar resiliencia y reducción a exposición                         |
| Anticipación y prevención (investigación, CyT, educación, prevención, entrenamiento) | - eventos extremos (ciclones, inundación, deslizamientos tierra, sequía)                                               | -agricultura (cambio cultivos, reforma agraria, tecnología riego)<br>- zonas urbanas     | -planeación<br>--normas de construcción<br>- zonas de exclusión, ANP                          | -entrenamiento de vulnerables y expuestos<br>-resolución de conflictos |
| Alerta temprana ante eventos extremos y posibles desastres                           | - eventos hidro-meteorológicos (ciclón, sequía inundación, temp. extremas) y geológicos (terremoto, volcanes, tsunami) | - agricultura (soberanía aliment.)<br>-salud pública<br>-protección civil<br>-gobernanza | -Estudios de vulnerabilidad en zonas y hogares<br>- rutas evacuación<br>- organización soc.   | -capitación<br>- evacuación preventiva<br>- resiliencia                |
| Preparación efectiva y respuesta rápida ante eventos extremos                        |                                                                                                                        | - organizaciones (inter)-nacionales y recurso natural                                    | -mapas de riesgos<br>-refugios, recursos<br>-comunic. Masiva<br>-aprendizaje                  | -mejoramiento/ restauración socio-ambiental<br>-prevención             |

# Conclusiones: el mundo se torna más pequeño

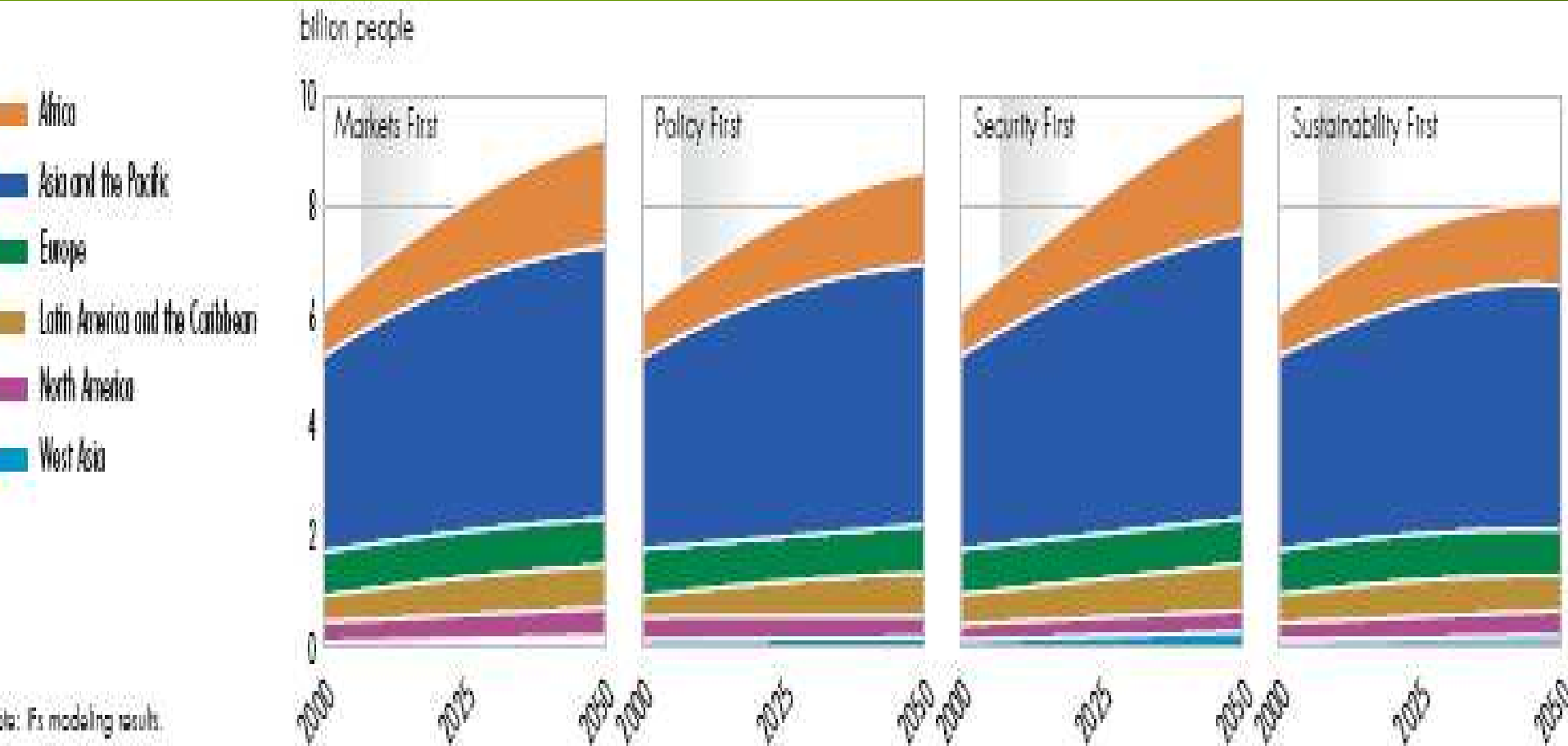


Notes: Numbers next to images of Earth reflect hectares of land per capita.

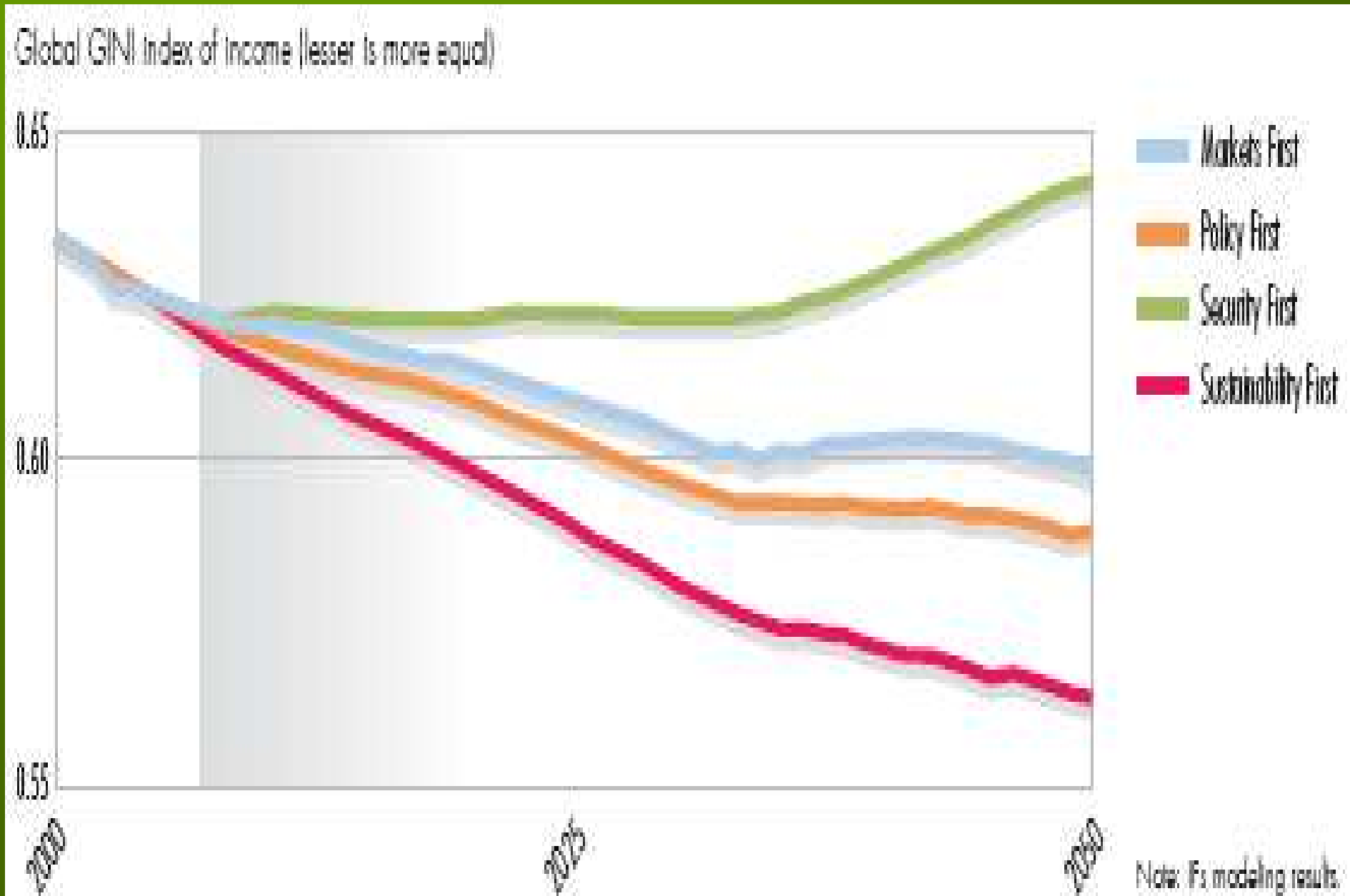
Graphs show changes in trade volume (1987–2005), GDP (1987–2004), CO<sub>2</sub> emissions (1990–2003) and agricultural land area (1987–2002).

Sources: FAOSTAT 2006, Chapter 9 population projection, WTO 2007, GEO Data Portal compiled from UNPD 2007 low estimate, World Bank 2006a, UNFCCC-CDIAC 2006 and FAOSTAT 2004

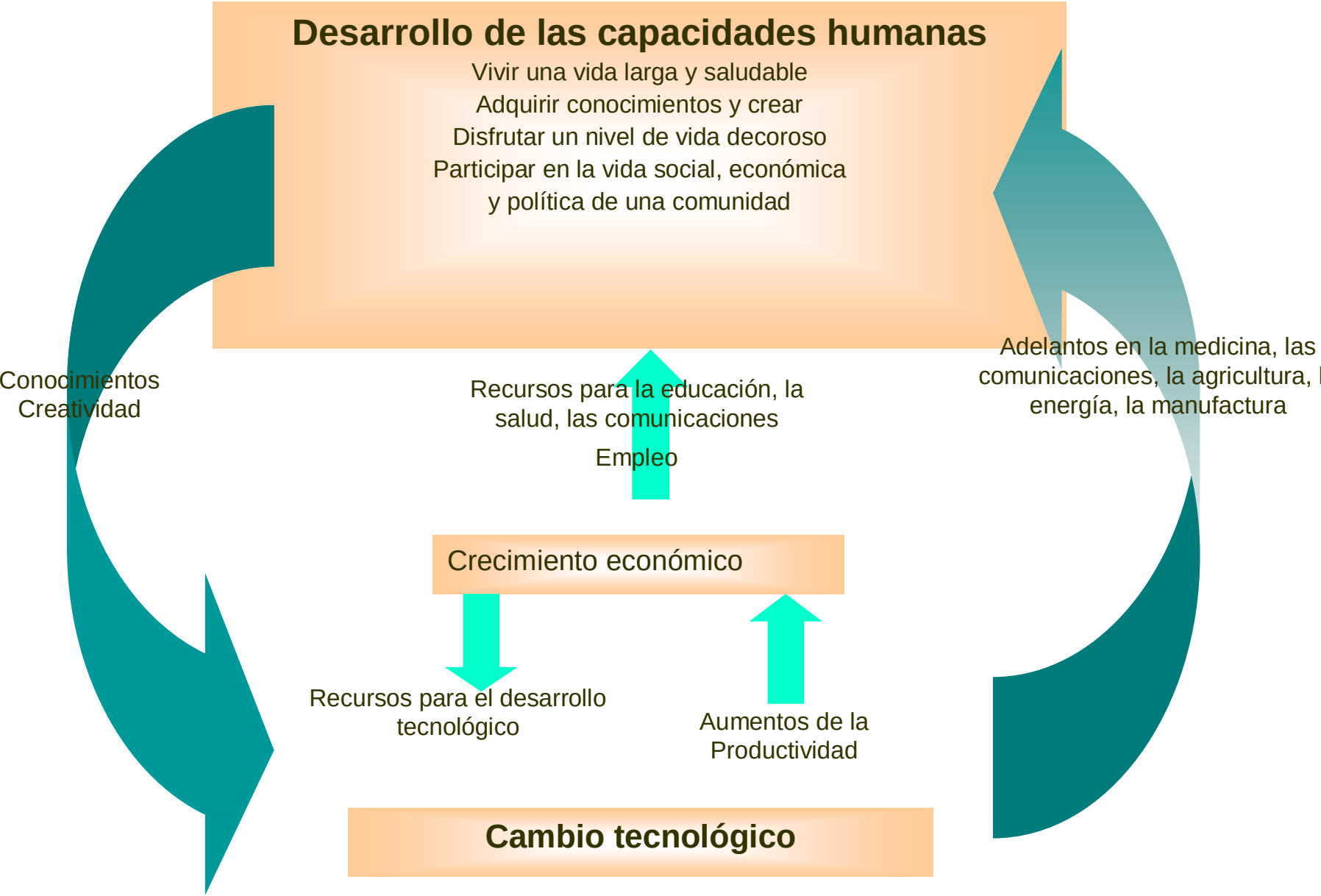
# Possibles Futuros: Modelos de desarrollo



# Desigualdad social: coeficiente Gini



# Política Científica de Seguridad Humana, de Género y Ambiental: HUGE en lugar de Seguridad Militar



# Políticas de Planeación





**Gracias por su atención**

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