

ISU-ISU LINGKUNGAN GLOBAL

BI2001 Pengetahuan Lingkungan

Topik Bahasan Kuliah

- Isu-isu lingkungan pada forum internasional
- Jasa lingkungan (*ecosystem services*) sebagai penentu kesejahteraan manusia



MASALAH LINGKUNGAN GLOBAL : KOMITMEN & KERJASAMA MULTILATERAL

2

- Aktifitas Manusia dan Ekosistem
 - Ekosistem banyak berubah dan mengalami degradasi terkait aktifitas manusia dalam memenuhi kebutuhan hidupnya akan : pangan, air, kayu, sandang, dan energi yang makin meningkat menyebabkan ekosistem dieksploitasi;
 - Eksploitasi sumberdaya alam yang tidak *sustainable* menyebabkan degradasi ekosistem → jasa ekosistem terdegradasi → kesejahteraan manusia terganggu
- Temuan Millenium Assessment (2005)
 - 1) 60% jasa ekosistem dunia mengalami degradasi;
 - 2) 15 dari 24 ekosistem yang dikaji dalam kondisi rusak;
 - 3) Sejak tahun 1980, 35% ekosistem mangrove dunia hilang;
 - 4) Sekitar 20% terumbu karang hilang, dan 20% mengalami degradasi;
 - 5) Polusi hara (*nutrient poluttion*) menyebabkan eutrofikasi badan-badan air;
 - 6) Laju kepunahan spesies 100-1000 kali lebih tinggi dari kondisi sebelumnya;
- 'BUMI yang SATU dan sedang "SAKIT" (TERDEGRADASI)" : HARUS dijaga dan diselamatkan dari faktor-faktor PERUSAKnya
 - Perlu KOMITMEN GLOBAL untuk LINGKUNGAN
 - Dibangunnya : MEAs (*Multilateral Environmental Agreements*)



MEAs : multilateral environmental agreements

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- MEAs : perjanjian multilateral tentang lingkungan merupakan instrumen legal (hukum)
 - ▣ Bertujuan untuk perlindungan lingkungan
 - ▣ Disepakati diantara sejumlah besar negara atau organisasi internasional sebagai pesertanya (parties) dan dalam bentuk tertulis;
 - ▣ Diatur oleh hukum internasional
 - ▣ Dapat diwujudkan dalam satu atau lebih instrumen yang berkaitan (dalam bentuk perjanjian kerangkakerja/*framework agreements*)

KELOMPOK MEA	KONVENSI PENTING
Biodiversity	The Biodiversity Convention
Atmosphere	Montreal Protocol on Substances that Deplete Ozone Layer The Kyoto Protocol to the UN Framework Convention on Climate Change
Land	United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification
Chemicals And Hazardous Wastes	Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal Rotterdam Convention on the Prior Informed Consent for Certain Hazardous Chemicals and Pesticides in International Trade Stockholm Convention on Persistent Organic Pollutants (POPs).
Regional Seas And Related	17 Regional Seas Conventions and A number of Protocols on land-based sources of pollution of marine environment Global Program of Action for the Protection of the Marine Environment from Land-Based Activities (GPA)

Inisiatif MEAs banyak dilakukan sejak 1960 dengan makin menguatnya Gerakan Lingkungan global di berbagai negara, namun demikian inisiatif beberapa MEAs juga telah dilakukan sebelum UN Conference on the Human Environment 1972:

1872: Swiss propose international commission to protect migratory birds

1900: Convention for the Preservation of Animals, Birds and Fish in Africa (*first MEA agreement*)

1900: European littoral states sign treaty to regulate transportation of toxic substances on Rhine River

1909: Canada-US Boundary Waters Treaty

1911: North Pacific Fur Seal Commission established by USA, Canada, USSR and Japan 1918: US-Canada Migratory Bird Treaty Act

1931: First efforts to regulate commercial whaling, led (in 1946) to International Convention for the Regulation of Whaling and establishment of International Whaling Commission

1940: Convention on Nature Protection and Wildlife Conservation in the Western Hemisphere

1946: Founding of the United Nations and World Bank, which would play leading roles in international environmental cooperation (World Bank, UNIMO, FAO, UNDP, WHO, UNEP & UNESCO)

1954: International Convention for the Prevention of Pollution of the Sea by Oil

1958: International Maritime Consultative Organization (UN-IMCO)

1971: RAMSAR Convention on Wetlands of International Importance

1972: UNESCO-sponsored Convention for the Protection of World Cultural and Natural Heritage.

1972: Oslo Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft.

1972: US-Can Great Lakes Water Quality Agreement

MEAs Sebelum UN Conference on the Human Environment 1972



TAHUN	PERISTIWA	HASIL PENTING
1972	UN Conference on the Human Environment	Stockholm Declaration : ada 26 prinsip Stockholm Action Plan : 109 rekomendasi UNEP (UN Environment Programme) dan Environment Fund
1983	World Commission on Environment and Development	1987 : Laporan OUR COMMON FUTURE (Masa Depan Bersama)/Brundland Report
1992	UN Conference on Environment and Development	Rio Declaration on Environment and Development Agenda 21 Statement of Forest Principles UN Framework Convention on Climate Change Convention on Biological Diversity Convention to Combat Desertification Call for creation of a Commision on Sustainable Development
2003	World Summit on Sustainable Development	Johannesburg Declaration Johannesburg Plan of Implementation
2012	UN Conference in Sustainable Development	The Future We Want



Global Environmental Milestones (UNEP, 2013)



UNITED NATIONS MULTILATERAL TREATIES

6

1. Convention on Long-range Transboundary Air Pollution. Geneva, 13 November 1979

- 1.a.** Protocol to the 1979 Convention on Long-range Transboundary Air Pollution on Longterm Financing of the Co-operative Programme for Monitoring and Evaluation of The Long-range Transmission of Air Pollutants in Europe (EMEP). Geneva, 28 September 1984
- 1.b.** Protocol to the 1979 Convention on Long-Range Transboundary Air pollution on The Reduction of Sulphur Emissions or their Transboundary Fluxes by at least 30 per cent. Helsinki, 8 July 1985
- 1.c.** Protocol to the 1979 Convention on long-range transboundary air pollution concerning the control of emissions of nitrogen oxides or their transboundary fluxes. Sofia, 31 October 1988
- 1.d.** Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution concerning the Control of Emissions of Volatile Organic Compounds or their Transboundary Fluxes. Geneva, 18 November 1991
- 1.e.** Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution on Further Reduction of Sulphur Emissions. Oslo, 14 June 1994
- 1.f.** Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution on Heavy Metals. Aarhus, 24 June 1998
- 1.g.** Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution on Persistent Organic Pollutants. Aarhus, 24 June 1998
- 1.h.** Protocol to the 1979 Convention on Long-range Transboundary Air Pollution to Abate Acidification, Eutrophication and Ground-level Ozone. Gothenburg (Sweden), 30 November 1999
- 1.i.** Amendments to the Text and to Annexes I, II, III, IV, VI and VIII to the 1998 Protocol on Persistent Organic Pollutants. Geneva, 18 December 2009
- 1.j.** Amendments to Annexes I and II to the 1998 Protocol on Persistent Organic Pollutants. Geneva, 18 December 2009
- 1.k.** Amendment of the text and annexes II to IX to the Protocol to the 1979 Convention on Long-range Transboundary Air Pollution to Abate Acidification, Eutrophication and Ground-level Ozone and the addition of new annexes X and XI. Geneva, 4 May 2012

2. Vienna Convention for the Protection of the Ozone Layer. Vienna, 22 March 1985

- 2.a. Montreal Protocol on Substances that Deplete the Ozone Layer. Montreal, 16 September 1987
- 2.b. Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer. London, 29 June 1990
- 2.c. Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer. Copenhagen, 25 November 1992
- 2.d. Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer. Montreal, 17 September 1997
- 2.e. Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer. Beijing, 3 December 1999

3. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. Basel, 22 March 1989

- 3.a. Amendment to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. Geneva, 22 September 1995
- 3.b. Basel Protocol on Liability and Compensation for Damage Resulting from Transboundary Movements of Hazardous Wastes and their Disposal. Basel, 10 December 1999

4. Convention on Environmental Impact Assessment in a Transboundary Context. Espoo, Finland, 25 February 1991

- 4.a. Amendment to the Convention on Environmental Impact Assessment in a Transboundary Context. Sofia, 27 February 2001
- 4.b. Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context. Kiev, 21 May 2003
- 4.c. Amendment to the Convention on Environmental Impact Assessment in a Transboundary Context. Cavtat, 4 June 2004

5. Convention on the Protection and Use of Transboundary Watercourses and International Lakes. Helsinki, 17 March 1992

- 5.a. Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes. London, 17 June 1999
- 5.b. Amendments to Articles 25 and 26 of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes. Madrid, 28 November 2003

6. Convention on the Transboundary Effects of Industrial Accidents. Helsinki, 17 March 1992

7. United Nations Framework Convention on Climate Change. New York, 9 May 1992

- 7.a.** Kyoto Protocol to the United Nations Framework Convention on Climate Change. Kyoto, 11 December 1997
- 7.b.** Amendment to Annex B of the Kyoto Protocol to the United Nations Framework Convention on Climate Change. Nairobi, 17 November 2006
- 7.c.** Doha amendment to the Kyoto Protocol. Doha, 8 December 2012

8. Convention on Biological Diversity. Rio de Janeiro, 5 June 1992

- 8.a.** Cartagena Protocol on Biosafety to the Convention on Biological Diversity. Montreal, 29 January 2000
- 8.b.** Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity. Nagoya, 29 October 2010
- 8.c.** Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress to The Cartagena Protocol on Biosafety. Nagoya, 15 October 2010

9. Agreement on the conservation of small cetaceans of the Baltic, North East Atlantic, Irish and North Seas. New York, 17 March 1992

- 9.a.** Amendment to the Agreement on the conservation of small cetaceans of the Baltic, North East Atlantic, Irish and North Seas. Esbjerg, 22 August 2003

- 10. United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa. Paris, 14 October 1994**
- 11. Lusaka Agreement on Co-operative Enforcement Operations Directed at Illegal Trade in Wild Fauna and Flora. Lusaka, 8 September 1994**
- 12. Convention on the Law of the Non-Navigational Uses of International Watercourses. New York, 21 May 1997**
- 13. Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters. Aarhus, Denmark, 25 June 1998**
 - 13.a.** Protocol on Pollutant Release and Transfer Registers. Kiev, 21 May 2003
 - 13.b.** Amendment to the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters. Almaty, 27 May 2005
- 14. Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade. Rotterdam, 10 September 1998**
- 15. Stockholm Convention on Persistent Organic Pollutants. Stockholm, 22 May 2001**
- 16. Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents on Transboundary Waters to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes and do the 1992 Convention on the Transboundary Effects of Industrial Accidents. Kiev, 21 May 2003**

PENGESAHAN BEBERAPA KONVENSI LINGKUNGAN INTERNASIONAL OLEH PEMERINTAH INDONESIA

Pengesahan adalah perbuatan hukum untuk mengikatkan diri pada suatu perjanjian internasional dalam bentuk ratifikasi (*ratification*), aksesasi (*accession*), penerimaan (*acceptance*) dan penyetujuan (*approval*) (UU no.20 tahun 2004 : Perjanjian Internasional)

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1. Protokol Montreal	Protokol Montreal mengatur kesepakatan antar negara yang meratifikasi untuk mengurangi secara bertahap penggunaan CFC sampai menjelang tahun 2000. Tujuan protokol ini adalah untuk melindungi kesehatan manusia dan lingkungan dari dampak negatif kegiatan manusia yang merusak lapisan ozon	Keputusan Presiden Republik Indonesia Nomor 23 Tahun 1992 Tentang Pengesahan Vienna Convention For The Protection Of The Ozone Layer Dan Montreal Protocol On Substances That Deplete The Ozone Layer As Adjusted And Amended By The Second Meeting Of The Parties London, 27 - 29 June 1990
2. Protokol Kyoto	Protokol Kyoto mengatur kerangka kerja tentang konvensi perubahan iklim, protokol ini dilengkapi dengan dua Annex, yaitu Annex A dan Annex B. Annex A mengenai gas-gas rumah kaca yang terdiri dari atas: CO ₂ , CH ₄ , N ₂ O, PFC, dan FC ₆ . Annex B mengenai kategori energi, industri energii, industri manufaktur. Annex ini merupakan perhitungan pembatasan atau reduksi gas-gas rumah kacayang menjadi komitmen para pihak.	Undang Republik Indonesia Nomor 17 Tahun 2004 Tentang Pengesahan Kyoto Protocol To The United Nations Framework Convention On Climate Change (Protokol Kyoto Atas Konvensi Kerangka Kerja Perserikatan Bangsa-bangsa Tentang Perubahan Iklim)

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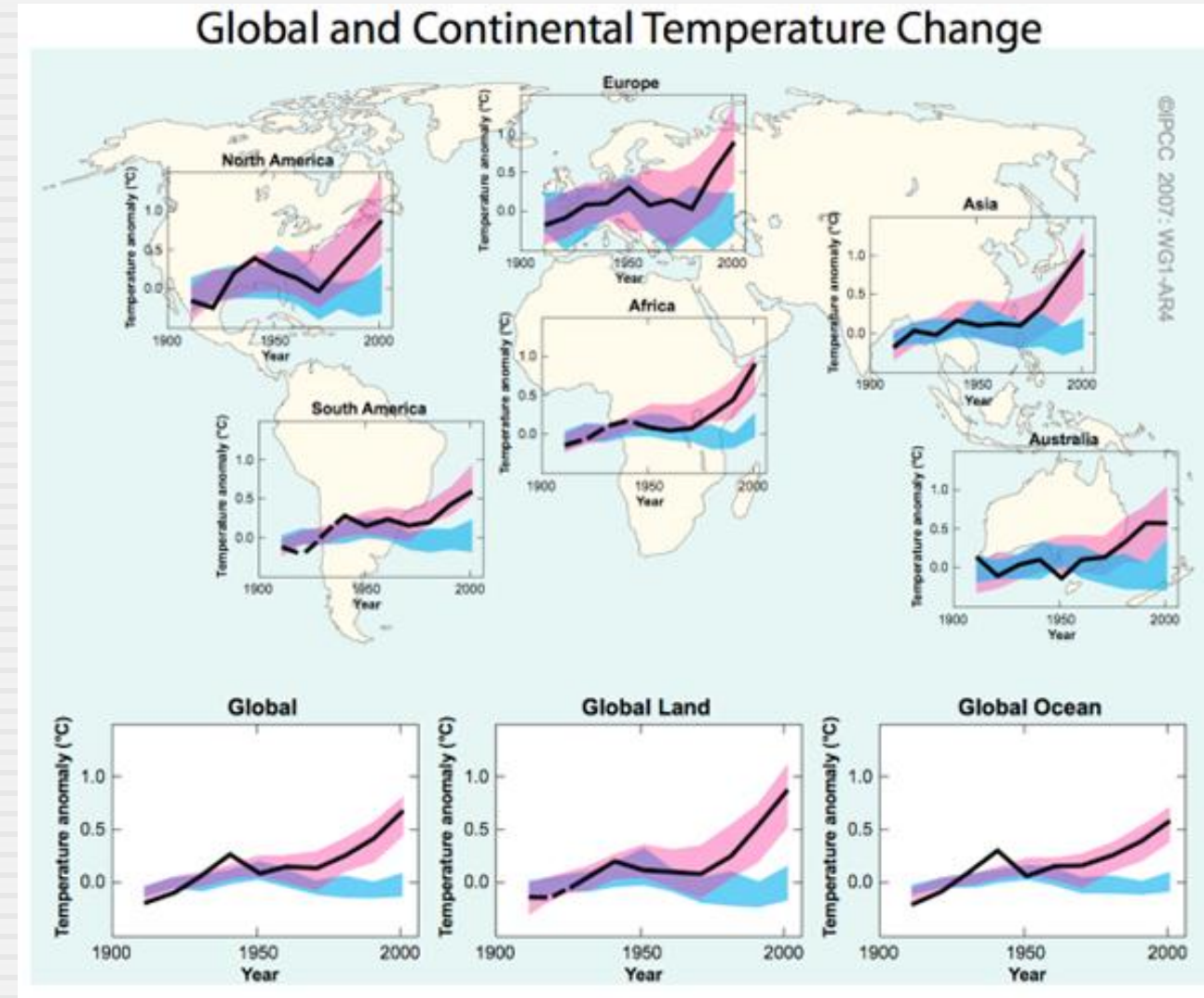
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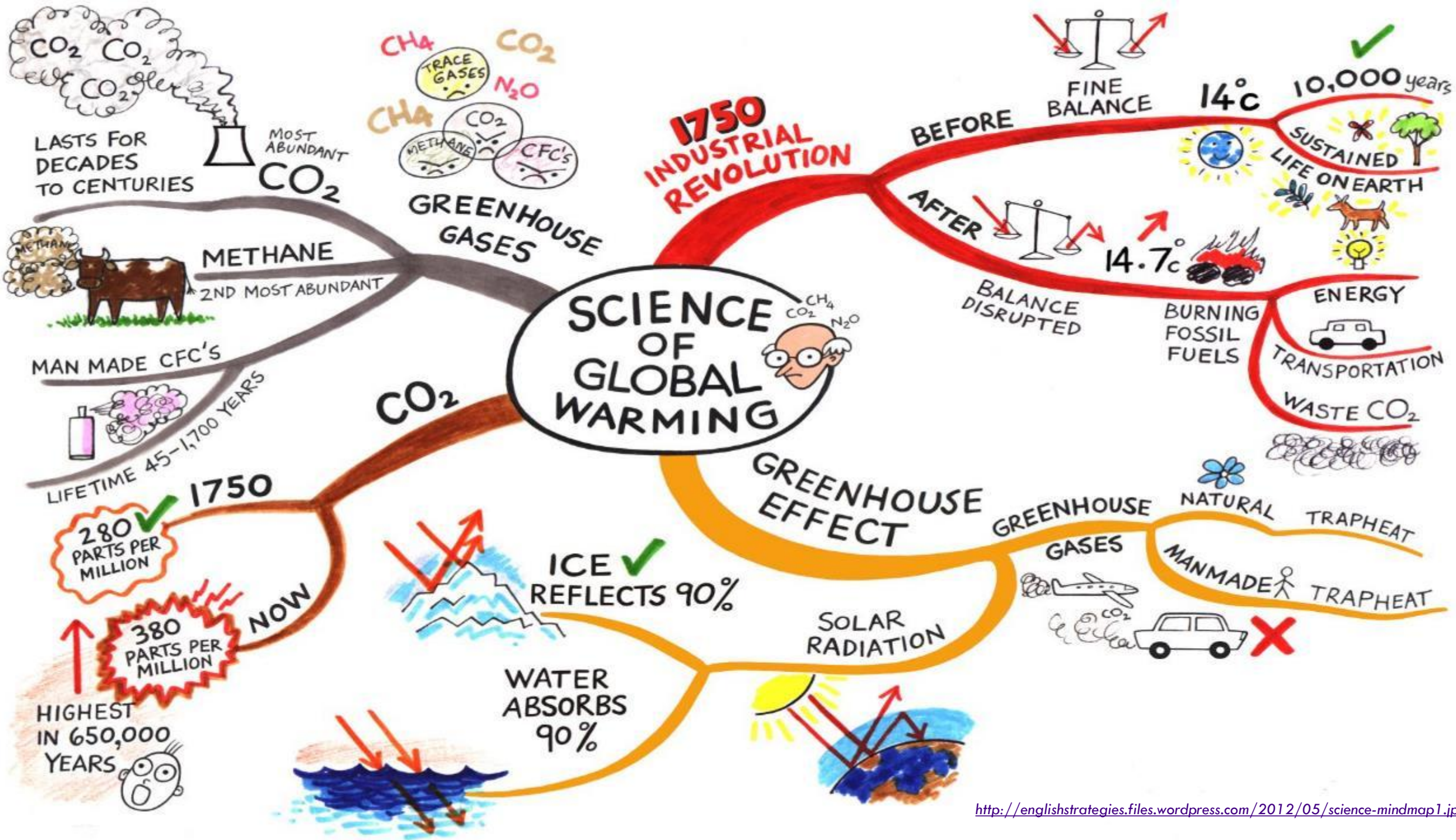
3. Konvensi Basel	Konvensi ini mengatur tentang pengawasan perpindahan lalu lintas batubara limbah B3 dan pembuangannya/penyimpanannya. Konvensi ini melarang ekspor limbah beracun ke negara yang tidak mampu mengelola secara berwawasan lingkungan	Keppres Nomor 61 Tahun 1993 tentang Ratifikasi Konvensi Basel
4. Konvensi Keragaman Hayati	Konvensi ini mengatur perlindungan keragaman hayati. Setiap negara mempunyai hak berdaulat untuk memanfaatkan sumber daya hayatinya sesuai dengan kebijakan lingkungannya. Konvensi ini bertujuan menaati pemanfaatan komponen-komponennya secara berkelanjutan dan membagi keuntungan yang dihasilkan dari pemanfaatan sumber daya genetik secara adil dan merata.	Undang-Undang nomor 5 tahun 1992 tentang Pengesahan Konvensi Keragaman Hayati tanggal 1 Agustus 1994
5. Konvensi tentang Perubahan Iklim	Konvensi ini bertujuan untuk mencapai kestabilan konsentrasi gas rumah kaca di atmosfer pada tingkat yang dapat mencegah kondisi yang membahayakan sistem iklim dalam jangka waktu cukup agar ekosistem dapat menyesuaikan diri dengan perubahan iklim.	Undang-Undang Nomor 6 tahun 1994 tentang Konvensi PBB mengenai Perubahan Iklim tanggal 23 Agustus 1994.
6. Deklarasi Rio	Kesepakatan tidak mengikat (<i>non legally binding</i>) yang dihasilkan dalam KTT Rio 1992 memuat Pinsip-Prinsip Dasar Pengelolaan Lingkungan Hidup dalam Kerangka Pembangunan Berkelanjutan	<i>acceptance</i>
8. Agenda 21	Agenda ini memuat program dan strategi rinci untuk mendorong pembangunan berkelanjutan di seluruh negara di dunia, agenda ini bersifat <i>Non legally Binding</i> . Untuk menjaga penerapan Agenda-21 UNCED membentuk Commission for Sustainable Development (CSD)	<i>acceptance</i>

PERUBAHAN IKLIM DAN PEMANASAN GLOBAL

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- Perubahan Iklim ialah perubahan suhu, tekanan udara, angin, curah hujan, dan kelembaban sebagai akibat dari Pemanasan Global.
- Pemanasan Global ialah meningkatnya temperatur rata-rata bumi sebagai akibat dari akumulasi panas di atmosfer yang disebabkan oleh Efek Rumah Kaca.
- Efek Rumah Kaca ialah fenomena menghangatnya bumi karena radiasi sinar matahari dari permukaan bumi dipantulkan kembali ke angkasa yang terperangkap oleh “selimut” dari gas-gas CO₂ (karbon dioksida), CH₄ (metana), N₂O (nitrogen dioksida), PFCS (perfluorokarbon), HFCS (hidrofluorokarbon), dan SF₆ (sulfurheksafluorida)
- Efek Rumah Kaca menyebabkan terjadinya Pemanasan Global yang dapat menyebabkan Perubahan Iklim. Hubungan di antara ketiganya adalah hubungan sebab-akibat. (wwf.or.id)



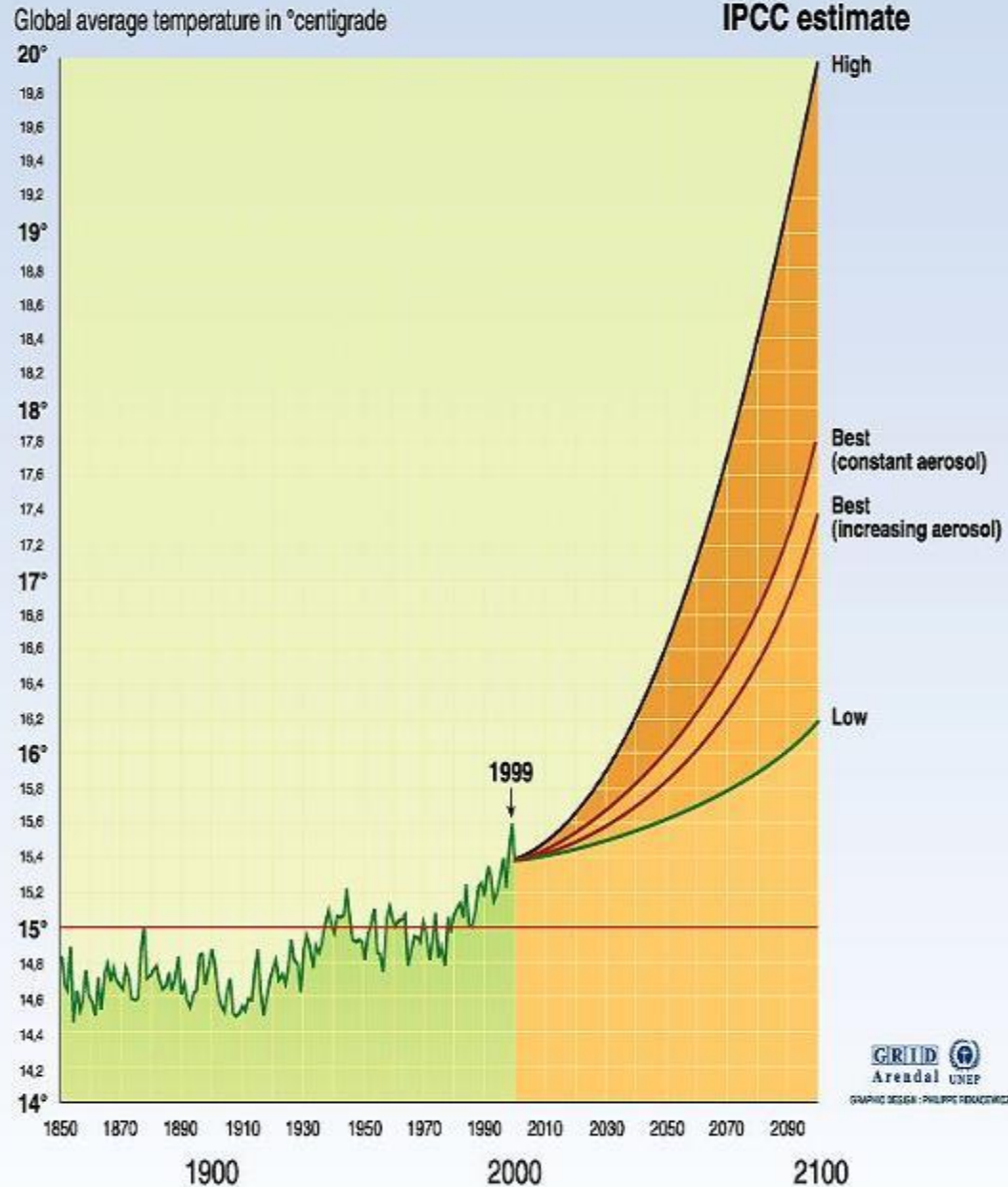


Perubahan Suhu,
Perubahan Iklim
dan Dampak
Potensialnya

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Projected changes in global temperature:

global average 1856-1999 and projection estimates to 2100



Source : Temperatures 1856 - 1999: Climatic Research Unit, University at East Anglia, Norwich UK. Projections: IPCC report 95.

Potential Impacts



Health
Weather-Related Mortality
Infectious Diseases



Agriculture
Crop Yields
Irrigation Demands



Forests
Composition
Geographic Range
Health and Productivity



Water Resources
Water Supply
Water Quality
Competition for Water



Coastal Areas
Erosion of Beaches
Inundation of Coastal Lands
Costs to Protect Communities



Natural Areas
Loss of Habitat and Species

Climate Changes



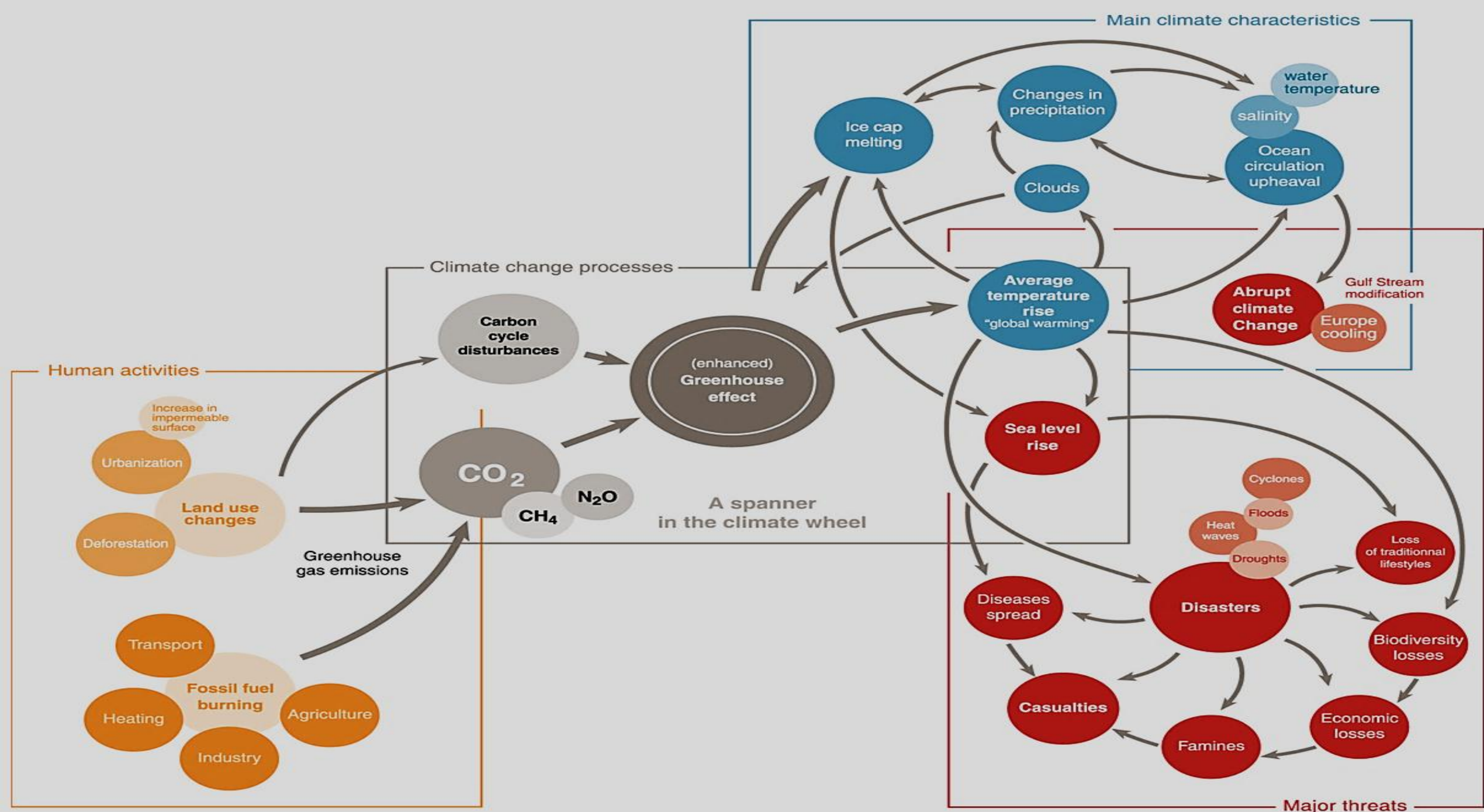
Temperature



Precipitation



Sea-Level Rise



□ Prakiraan Dampak Pemanasan Global di Indonesia

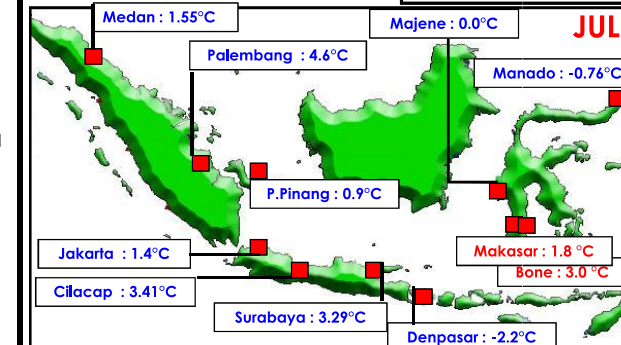
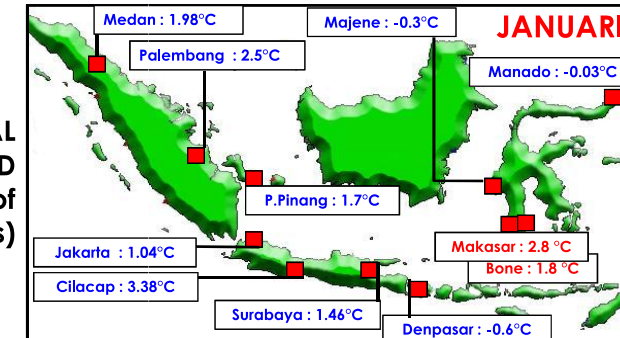


Perbedaan Perubahan Temperatur dan Curah Hujan antara periode 1979-2003 dan periode 2075-2099

Parameter	Musim Kemarau (Jun-Jul-Aug)	Musim Hujan (Dec-Jan-Feb)	Kesimpulan
Temperatur	<p>Kenaikan Temperatur</p> <ul style="list-style-type: none"> Sebagian besar Sumatera bag. Utara dan Bengkulu (3°C) Sebag. Besar Kalimantan (3°C) Sulawesi bag. Tengah, tenggara dan utara (3°C) Sekitar Halmahera dan Papua bag. Utara (3°C) Lampung, Sumsel, sebag. Besar Jawa, Bali, NTB, NTT Sulse Maluku dan Papua bag. Selatan (2.5°C) <p>Penurunan Temperatur</p> <ul style="list-style-type: none"> Tidak ada 	<p>Kenaikan Temperatur</p> <ul style="list-style-type: none"> Kalteng (>3°C) Aceh, Sumut, selatan Riau, Sumbar, Bengkulu Jawa bag. Selatan, Bali, NTB, NTT, sebag. Besar Kalimantan, sebag. Besar Sulawesi, Maluku dan Papua (3°C) Riau, Jambi, Sumsel, Lampung, pantura Jawa, Kalteng, sebag. Kalbar, dan Merauke (2.5°C) <p>Penurunan Temperatur</p> <ul style="list-style-type: none"> Tidak ada 	<p>Kenaikan temperatur baik di Musim Hujan maupun di musim kemarau pada umumnya berkisar antara 2-3°C</p> <p>Wilayah yang mengalami kenaikan temperatur lebih luas pada waktu musim hujan dibanding pada musim kemarau terutama di Kalimantan dan Papua</p>
Curah Hujan	<p>Kenaikan Curah Hujan</p> <ul style="list-style-type: none"> Bag. Selatan Aceh dan bag. Selatan Sumut (40%) Sebag. Besar Sumatera, pantura Jawa, Kalimantan, NTT dan Papua (20%) <p>Penurunan Curah Hujan</p> <ul style="list-style-type: none"> Bengkulu, Lampung bag. Selatan, sebagian besar Jawa, Bali, NTB, sebag. Besar Sulawesi, Kep. Maluku, sekitar Kepala Burung dan bag. Tengah Papua (20%) 	<p>Kenaikan Curah Hujan</p> <ul style="list-style-type: none"> Kalteng (>50%) Riau bag. Timur, Merauke, Sulse bag. Selatan, pesisir Bengkulu (40%) Riau, sebag Kalsel dan Kalteng (30%) Sebag. Besar Sumatera, Jawa, Bali, NTB, NTT sebag. Besar Kalimantan, Sulawesi, Maluku dan Papua (20%) <p>Penurunan Curah Hujan</p> <ul style="list-style-type: none"> Sekitar pegunungan Bukit Barisan dan sekitar pegunungan Jaya Wijaya Papua (10-20%) 	<p>Proyeksi curah hujan bervariasi dari pengurangan sampai dengan penambahan curah hujan, pada umumnya penurunan curah hujan terjadi di daerah pegunungan sekitar Bukit Barisan dan dataran tinggi papua sedangkan pada dataran tinggi Sulawesi Tengah terjadi kenaikan curah hujan.</p> <p>Penyebab dari hal tersebut masih dalam studi.</p>



IMPACT OF GLOBAL WARMING TOWARD INDONESIA : Increase of Temperature (in 100 years)

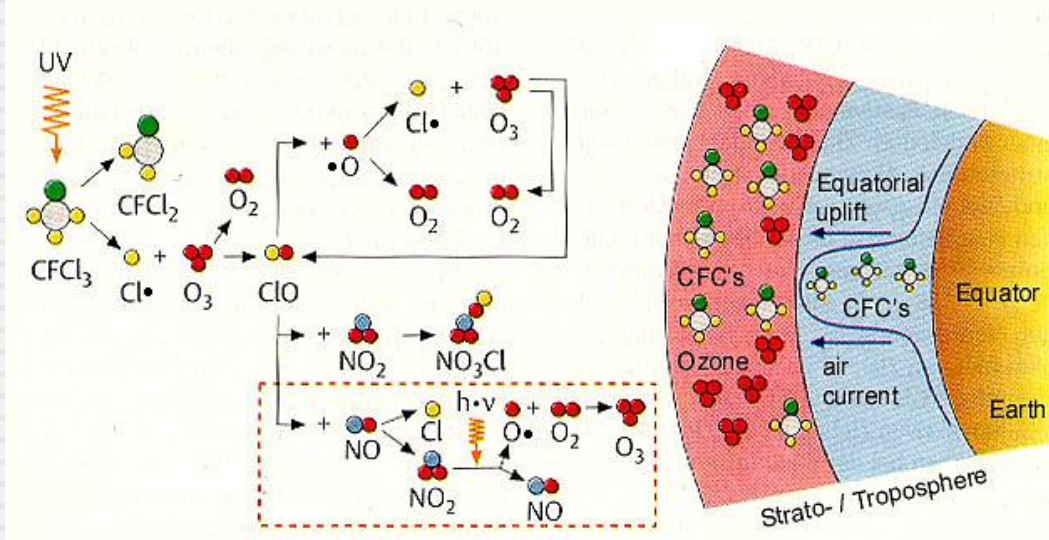


GLOBAL : 0.7°C/100 tahun

Timeline International Action on Climate Change



INTERNATIONAL ACTION ON CLIMATE CHANGE

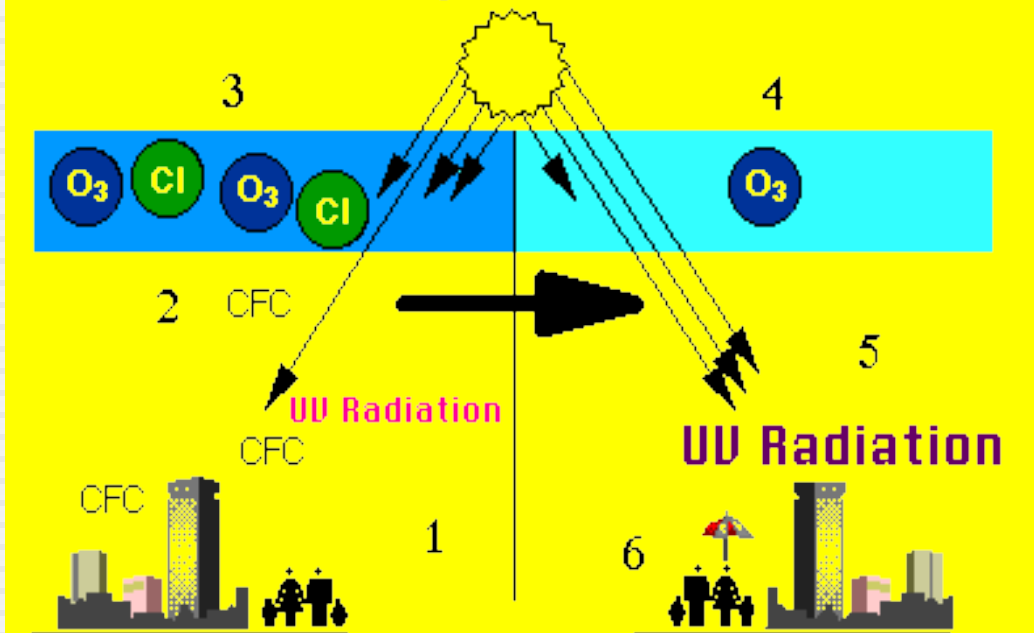


ISU LINGKUNGAN GLOBAL : OZONE DEPLETION

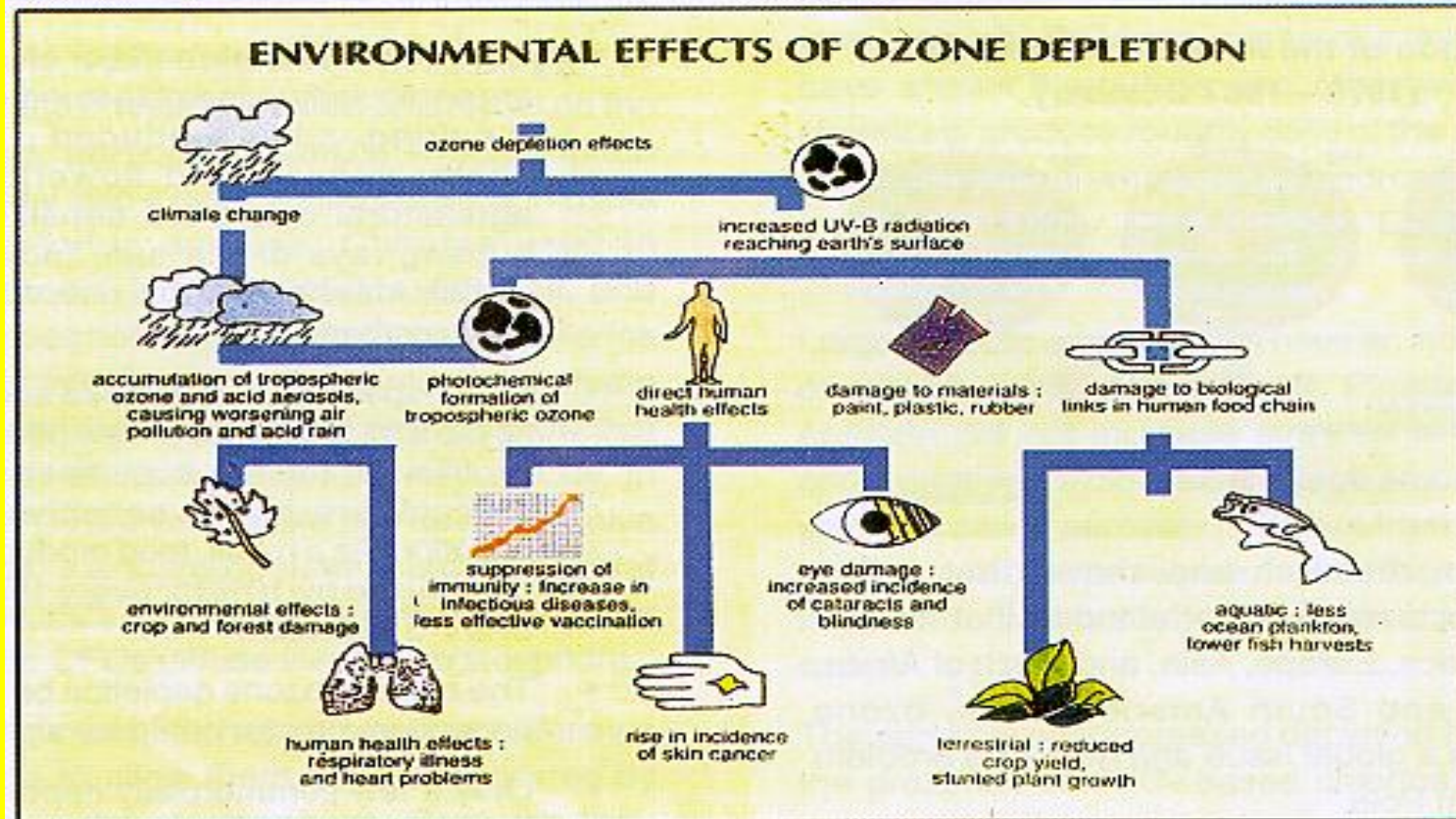
- ❑ Lapisan Ozon berfungsi sebagai filter untuk menyaring ultra violet
- ❑ NASA mengumumkan telah menemukan lubang ozon terbesar yang pernah terjadi di antariksa mencapai 3 kali luas wilayah AS.
- ❑ Rusaknya lapisan ozon sebagian besar disebabkan oleh CFC (Chlorofluorocarbon) yang digunakan sejak tahun 1928 untuk aerosol, kulkas, AC dll.

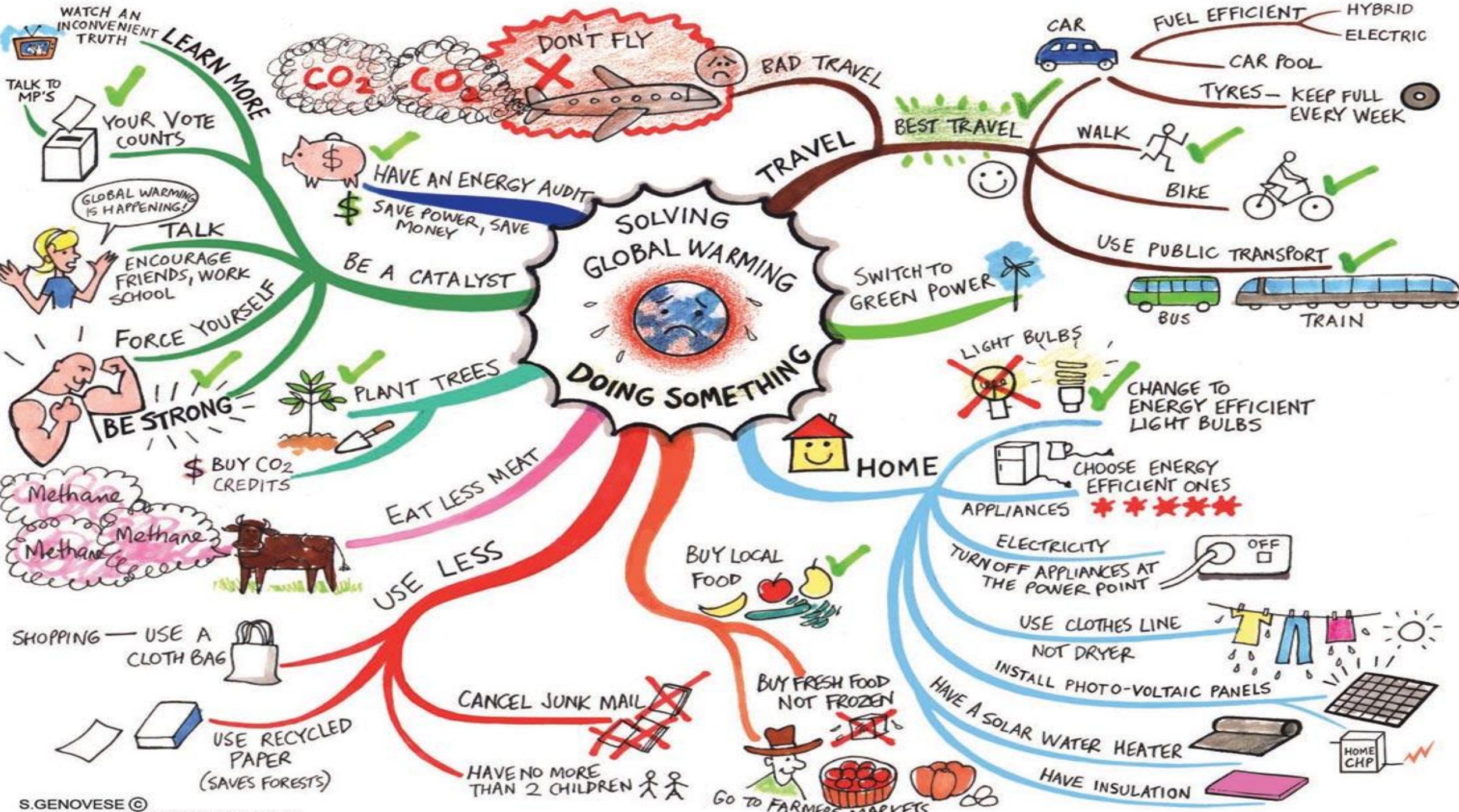
Ozone depletion due to CFC's

Ozone Depletion Process



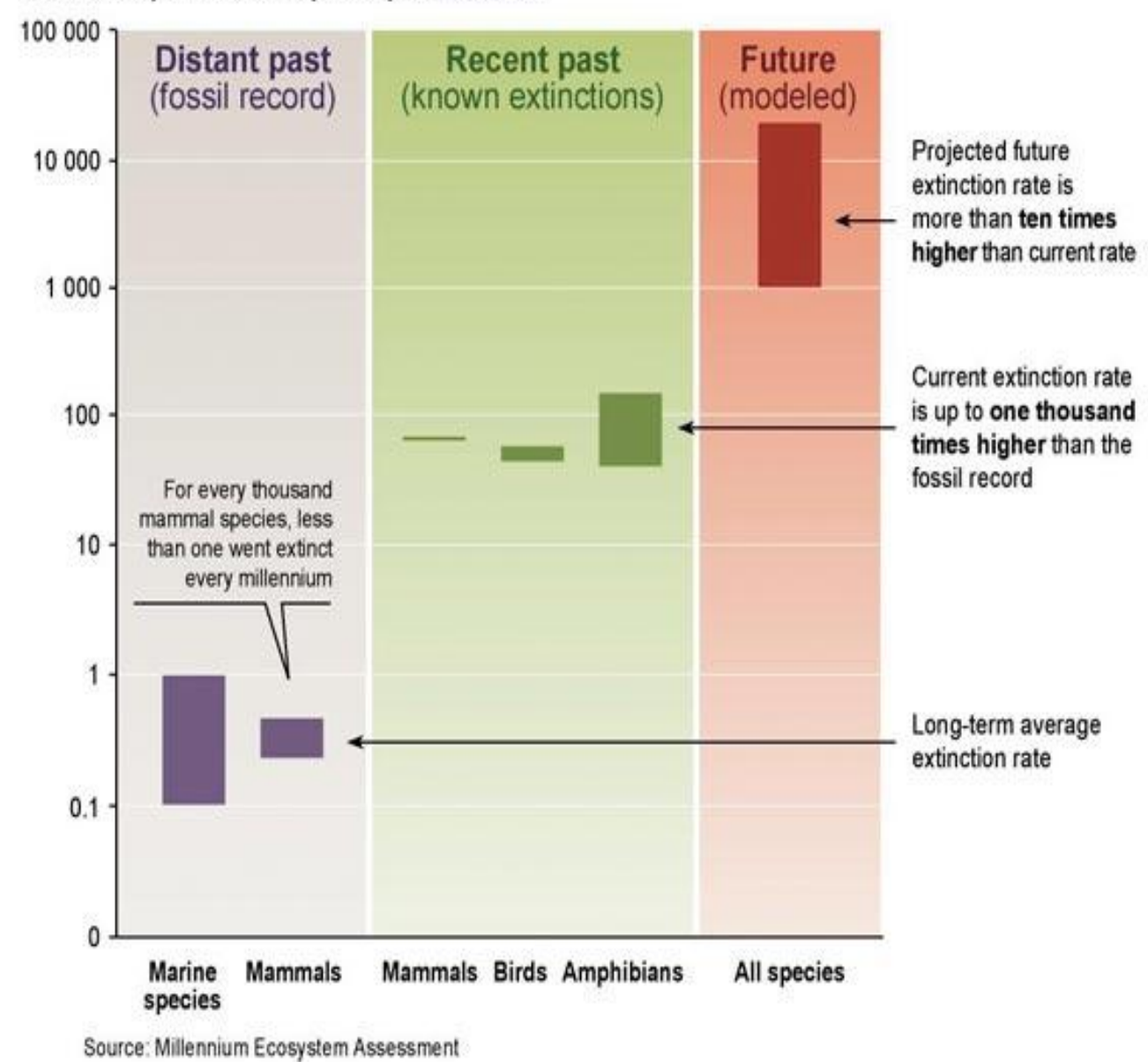
- 1 - CFCs released
- 2 - CFCs rise into ozone layer
- 3 - UV releases Cl from CFCs
- 4 - Cl destroys ozone
- 5 - Depleted ozone → more UV
- 6 - More UV → more skin cancer





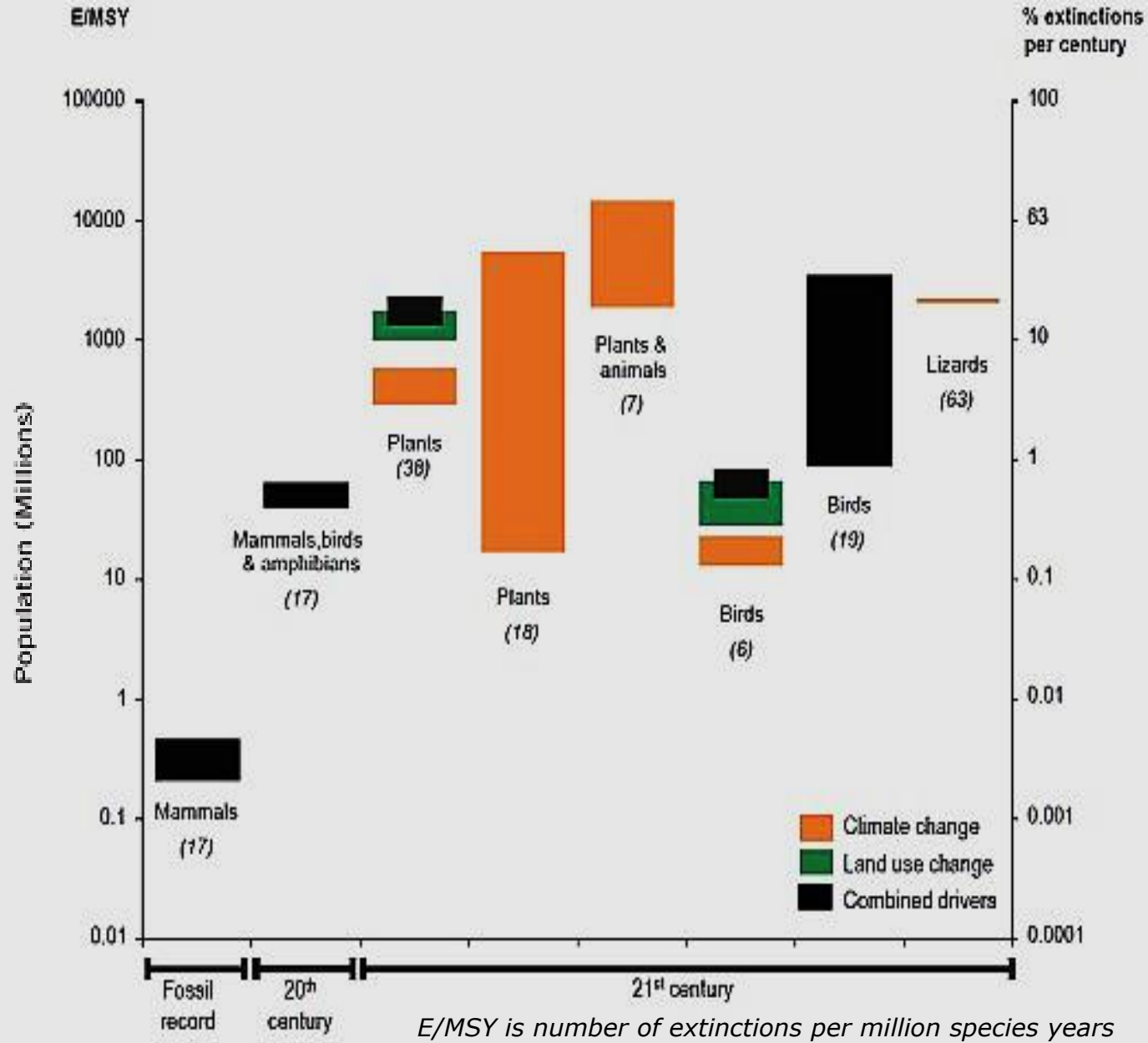
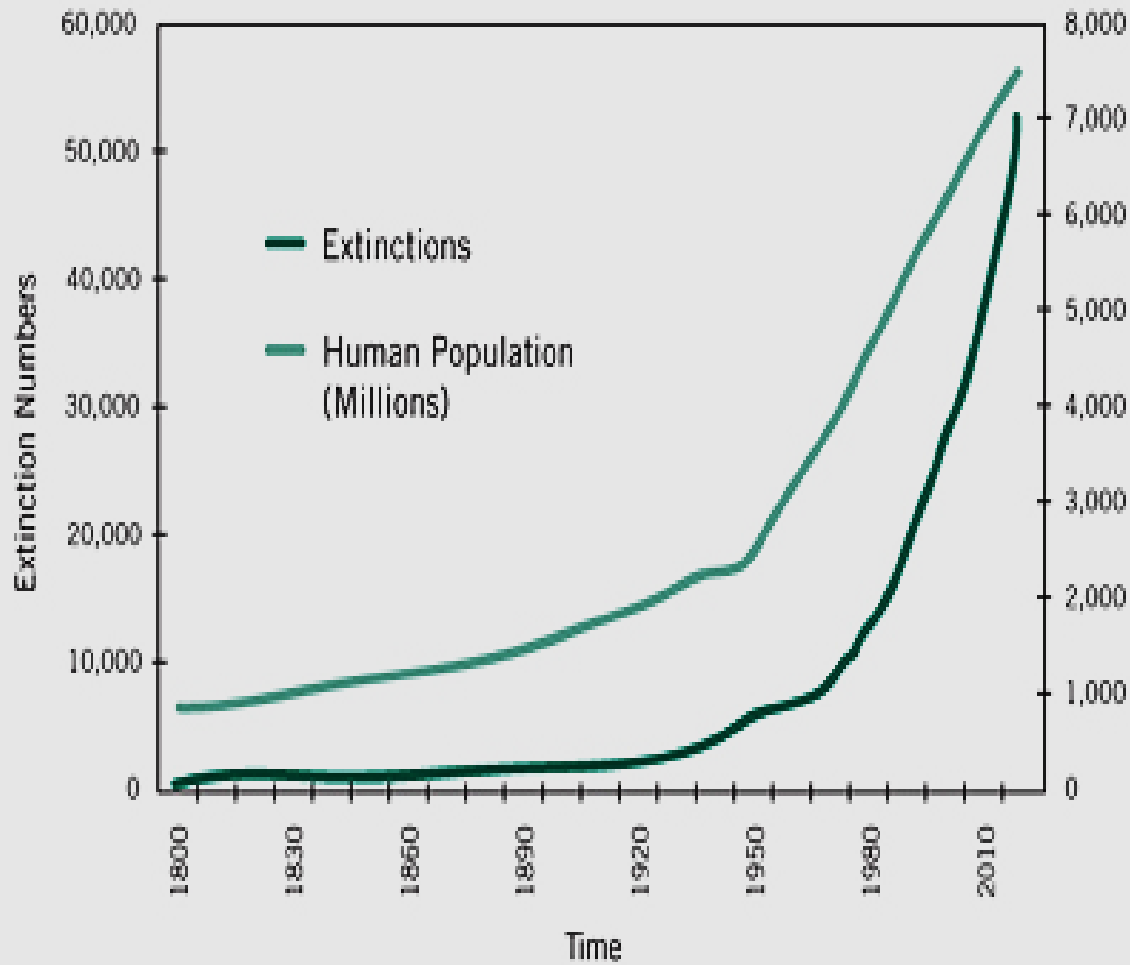
- ❑ Lebih dari 31.000 Species tumbuhan dan hewan sedang dalam ancaman kepunahan. 1/3 sampai 2/3 tumbuhan dan hewan akan punah pada abad berikutnya.
- ❑ Species yang terancam punah meliputi Mamalia (146 species), reptil (28 species), amfibi (33 species), ikan (91 species), moluska (3 species), invertebrata lain (28 species), dan tanaman (383 species).
- ❑ Estimasi World Resources Institute bahwa dari tahun 1960 sampai 1990 sebesar 1/5 hutan tropis telah berkurang, terumbu karang berkurang 10%, dan 50% mangrove telah hilang.
- ❑ Dari 1980 sampai 1995 hutan di negara-negara berkembang telah kehilangan 200 juta ha.
- ❑ Hilangnya habitat diprediksikan memicu 89% jenis burung dunia terancam punah, 83% jenis mamalia, dan 91% tumbuh-tumbuhan dunia masuk daftar kepunahan. Bahkan IUCN (International Union for Conservation of Nature and Natural Resources) mencatat sedikitnya 11.167 species di muka bumi sudah tergolong hampir musnah.

Extinctions per thousand species per millennium



Species Extinction and Human Population

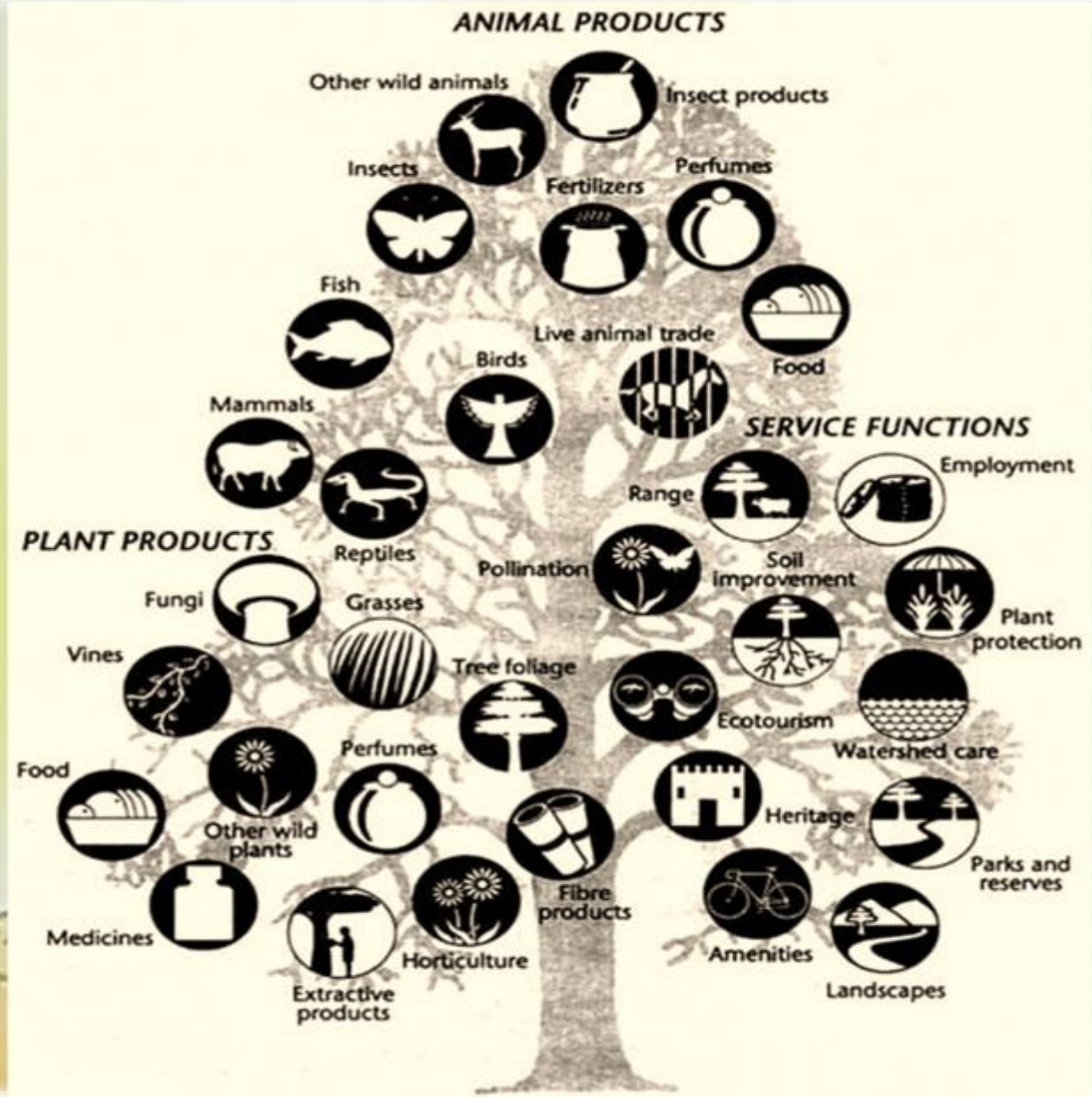
Graph source: USGS



LAJU KEPUNAHAN SPESIES

1992 CONVENTION ON BIOLOGICAL DIVERSITY. RIO DE JANEIRO, 5 JUNE 1992

- 29 -1- 2000** the Conference of the Parties to the Convention on Biological Diversity adopted a supplementary agreement to the Convention known as the **Cartagena Protocol on Biosafety.**
- 1993** *The Convention on Biological Diversity enters into force on 29 December 1993*
- 1995** COP2 Second meeting of the Conference of the Parties - Consideration of the need for and modalities of a protocol for the safe transfer, handling and use of living modified organisms. *Jakarta, Indonesia, 6 - 17 November 1995*
- 1996** COP3 Third meeting of the Conference of the Parties - Issues related to biosafety. *Buenos Aires, Argentina, 4 - 15 November 1996*
- 1996** BSWG1 First meeting of the Open-Ended Ad Hoc working Group on Biosafety. *Aarhus, Denmark, 22 - 26 July 1996*
- 1997** BSWG2 Second meeting of the Open-Ended Ad Hoc working Group on Biosafety. *Montreal, Canada, 12 - 16 May 1997*
- 1997** BSWG3 Third meeting of the Open-Ended Ad Hoc working Group on Biosafety. *Montreal, Canada, 13 - 17 October 1997*
- 1998** BSWG4 Fourth meeting of the Open-Ended Ad Hoc working Group on Biosafety. *Montreal, Canada, 5 - 13 February 1998*
- 1998** COP4 Fourth meeting of the Conference of the Parties - Issues related to biosafety. *Bratislava, Slovakia, 4 - 15 May 1998*
- 1998** BSWG5 Fifth meeting of the Open-Ended Ad Hoc working Group on Biosafety. *Montreal, Canada, 17 - 28 August 1998*
- 1999** BSWG6 Sixth meeting of the Open-Ended Ad Hoc working Group on Biosafety. *Cartagena, Colombia, 14 - 19 February 1999*
- 1999** BSIC1 Informal Consultation on the process to resume the Extraordinary Meeting of COP to adopt a protocol on Biosafety. *Montreal, Canada, 1 July 1999*
- 1999** BSIC2 Second Informal Consultation on the process to resume the Extraordinary Meeting of COP to adopt a protocol on Biosafety. *Vienna, Austria, 15 - 19 September 1999*
- 1999 - 2000** EXCOP1 First Extraordinary Meeting of the Conference of the Parties - Decisions on the continuation of the first extraordinary meeting of the Conference of the Parties to the Convention on Biological Diversity, **adoption of the Cartagena Protocol** and interim arrangements. *Cartagena, Colombia 22 - 23 February 1999 and Montreal, Canada, 24 - 28 January 2000*
- 2000** COP5 ***The Cartagena Protocol on Biosafety is opened for signature.***
Fifth meeting of the Conference of the Parties - Work plan of the Intergovernmental Committee for the Cartagena Protocol on Biosafety. *Nairobi, Kenya, 15 - 26 May 2000*
- 2000** ICCP1 First meeting of the Intergovernmental Committee for the Cartagena Protocol on Biosafety. *Montpellier, France, 11 - 15 December 2000*
- 2001** ICCP2 Second meeting of the Intergovernmental Committee for the Cartagena Protocol on Biosafety. *Nairobi, Kenya, 1 - 5 October 2001*
- 2002** COP6 Sixth meeting of the Conference of the Parties - Intergovernmental Committee for the Cartagena Protocol on Biosafety. *The Hague, Netherlands, 7 - 19 April 2002*
- 2002** ICCP3 Third meeting of the Intergovernmental Committee for the Cartagena Protocol on Biosafety. *The Hague, The Netherlands, 22 - 26 April 2002*
- 2003** ***The Cartagena Protocol on Biosafety enters into force on 11 September 2003***

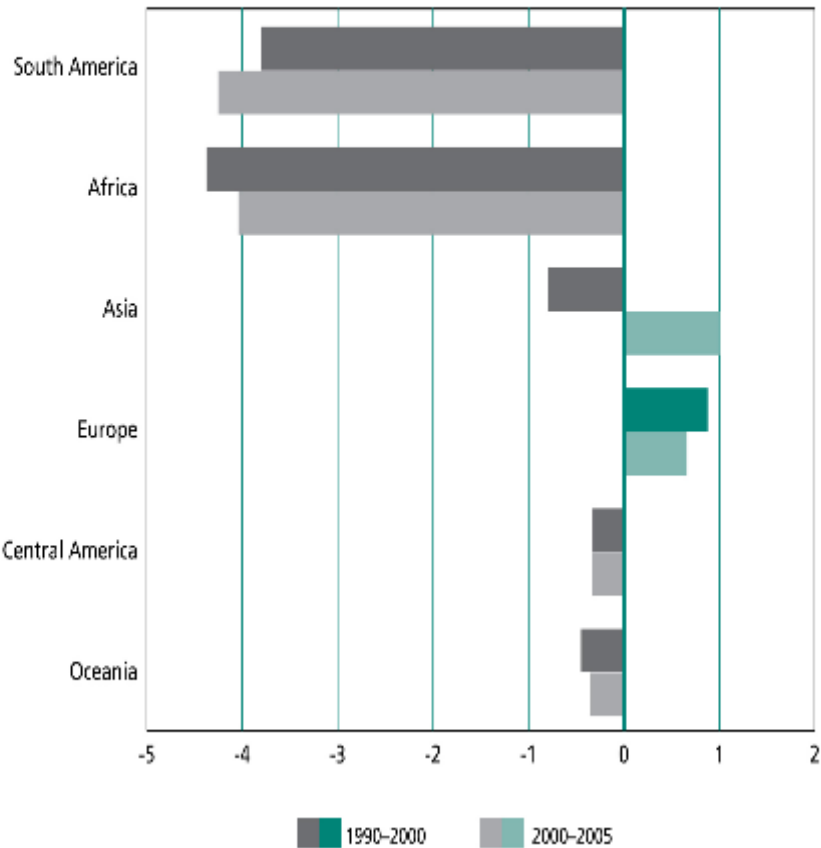


ISU LINGKUNGAN GLOBAL : HUTAN

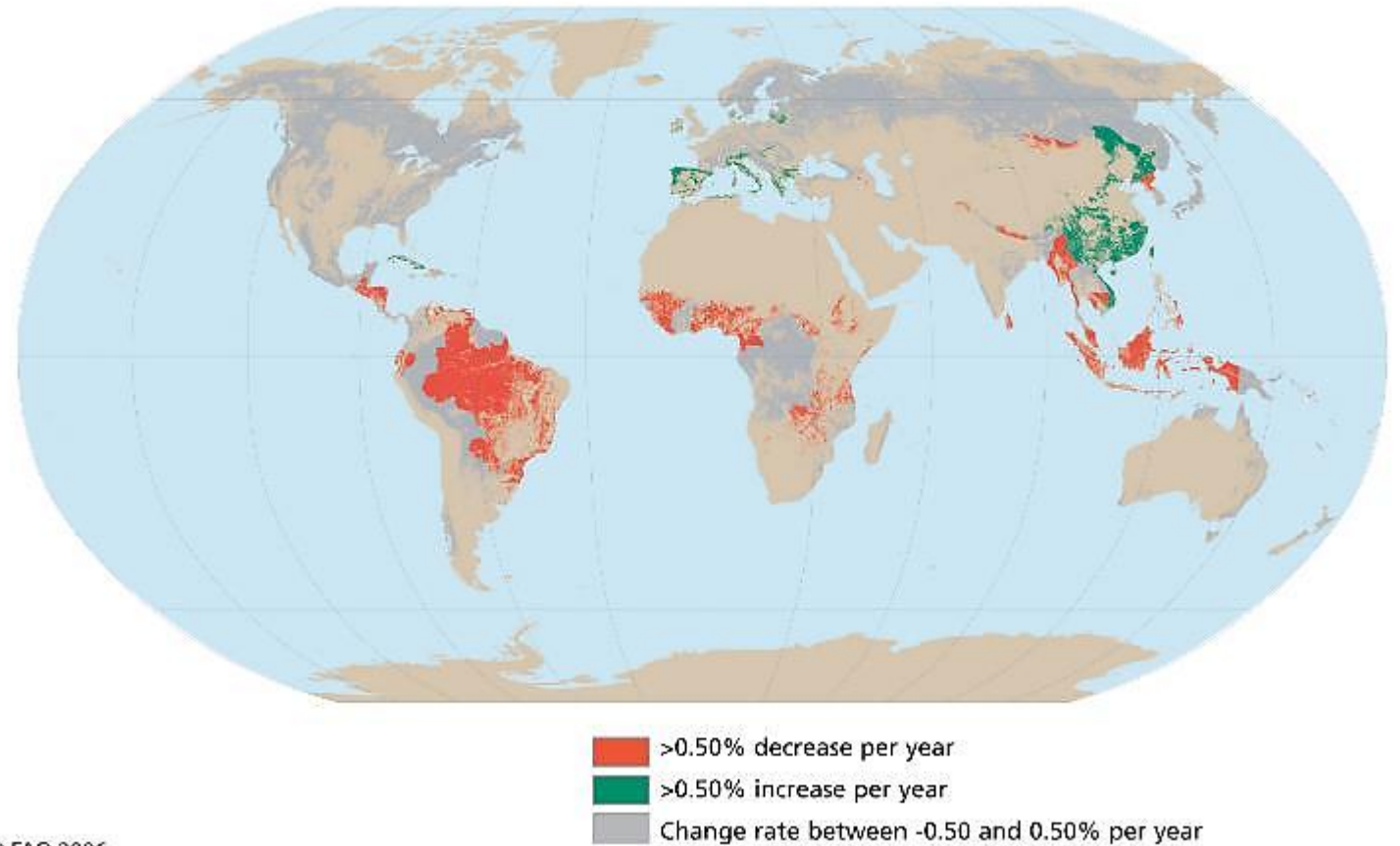
Perubahan Tutupan Hutan

25

Annual net change in forest area by region 1990–2005
(million ha per year)



Countries with large net changes in forest area 2000–2005



United Nations Forum on Forests (UNFF)

26

UNFF Principal Functions

October 2000

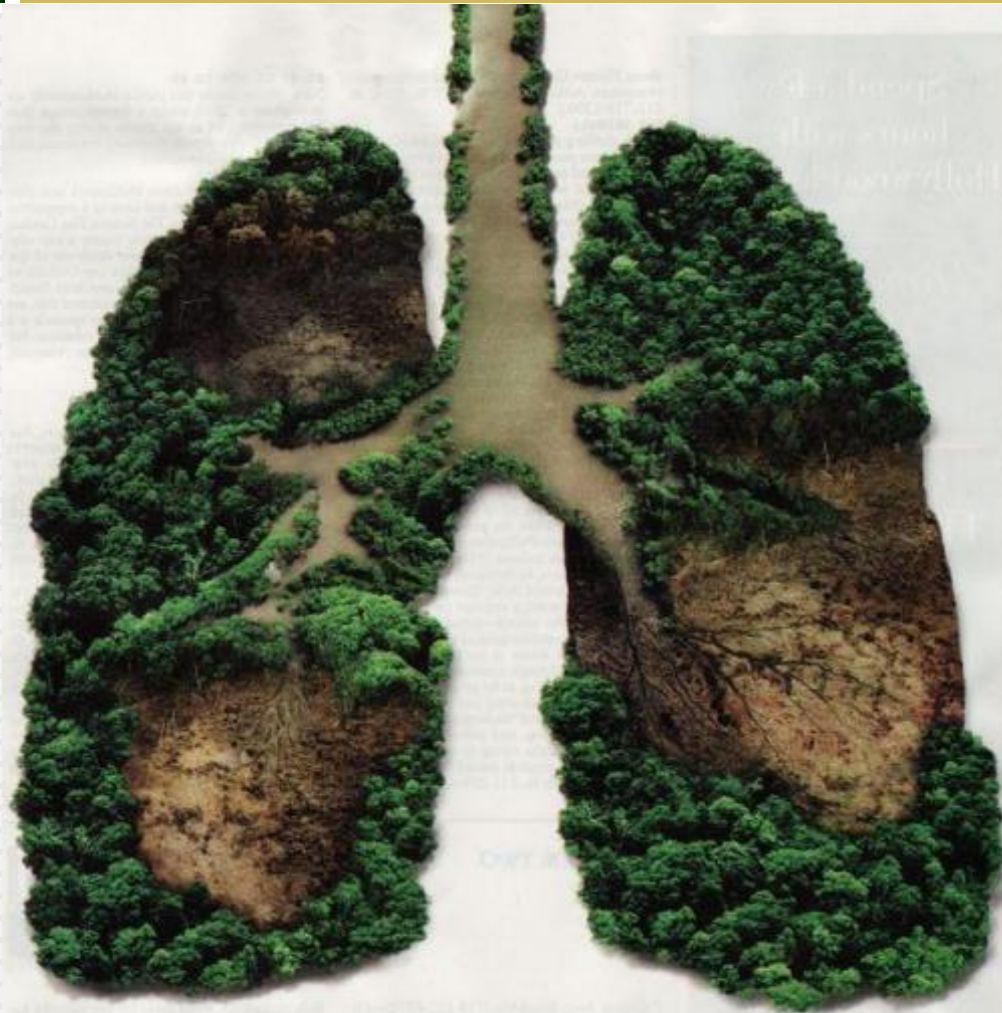


- 1) To facilitate implementation of forest-related agreements and foster a common understanding on sustainable forest management;
- 2) To provide for continued policy development and dialogue among Governments, international organizations, including major groups, as identified in Agenda 21 as well as to address forest issues and emerging areas of concern in a holistic, comprehensive and integrated manner,
- 3) To enhance cooperation as well as policy and programme coordination on forest-related issues
- 4) To foster international cooperation and to monitor, assess and report on progress of the above functions and objectives
- 5) To strengthen political commitment to the management, conservation and sustainable development of all types of forests.
- 6) Enhance the contribution of forests to the achievement of the internationally agreed development goals, including the Millennium Development Goals, and to the implementation of the Johannesburg Declaration on Sustainable Development and the Plan of Implementation of the World Summit on Sustainable Development, bearing in mind the Monterrey Consensus of the International Conference on Financing for Development;
- 7) Encourage and assist countries, including those with low forest cover, to develop and implement forest conservation and rehabilitation strategies, increase the area of forests under sustainable management and reduce forest degradation and the loss of forest cover in order to maintain and improve their forest resources with a view to enhancing the benefits of forests to meet present and future needs, in particular the needs of indigenous peoples and local communities whose livelihoods depend on forests;
- 8) Strengthen interaction between the United Nations Forum on Forests and relevant regional and subregional forest-related mechanisms, institutions and instruments, organizations and processes, with participation of major groups, as identified in Agenda 21 and relevant stakeholders to facilitate enhanced cooperation and effective implementation of sustainable forest management, as well as to contribute to the work of the Forum;

Tujuan utama UNFF :
the management, conservation and sustainable development of all types of forests and to strengthen long-term political commitment to this end...”based on the Rio Declaration, the Forest Principles, Chapter 11 of Agenda 21

REDD+ : HUTAN DAN PERUBAHAN IKLIM

27



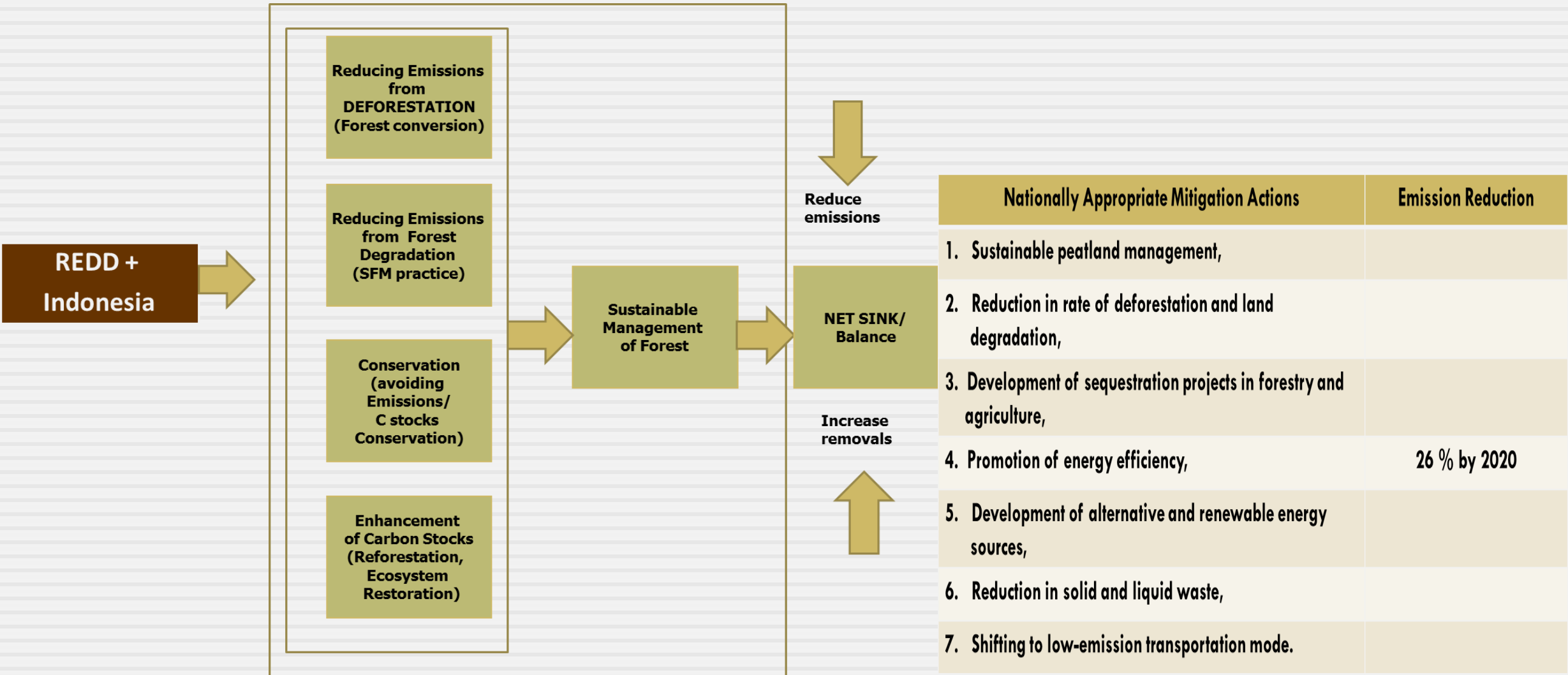
LOST THERE, FELT HERE.

REDD+

REDD+ helps to mitigate climate change through forests, and provides social and environmental benefits. It includes these essential components: creating incentives for not clearing standing forests, maintaining and expanding forest cover, sustainably managing forest and recovering degraded lands.



Scope of REDD+ according to Bali Action Plan



United Nations Conference on Desertification (UNCOD) : terkait dengan Permasalahan Perubahan Iklim, Hutan, dan Pembangunan Berkelanjutan

29

- ❑ **Date Description of event**
- ❑ 1977 United Nations Conference on Desertification (UNCOD) adopts Plan of Action to Combat Desertification (PACD)
- ❑ 1991 United Nations Environment Program (UNEP) concludes the problem of land degradation in arid, semi-arid and dry sub-humid areas have intensified
- ❑ 1992 United Nations Conference on Environment and Development (UNCED) is held in Riode Janeiro
- ❑ December 1992 General Assembly agreed and adopted resolution 47/188
- ❑ June 1994 The Intergovernmental Committee (INCD) for the Elaboration of an International Convention to Combat Desertification established by the UN General Assembly prepares a Convention To Combat Desertification
- ❑ June 17, 1994 UN Convention to Combat Desertification (CCD) adopted, and opened for signature in October
- ❑ December 26, 1996 CCD entered into force

Isu Lingkungan Global lainnya :

PENCEMARAN WILAYAH PERAIRAN

- World Water Development Report (WWDR) melaporkan bahwa setiap harinya sekitar 2 juta ton sampah mencemari wilayah perairan dan produksi limbah cair mencapai 1500 kubik. Maka bila satu liter limbah mencemari 8 liter air bersih, setidaknya 12.000 km kubik air bersih terkena polusi di dunia.
- Daerah perkotaan mengalami kehilangan air bersih hingga 20%.

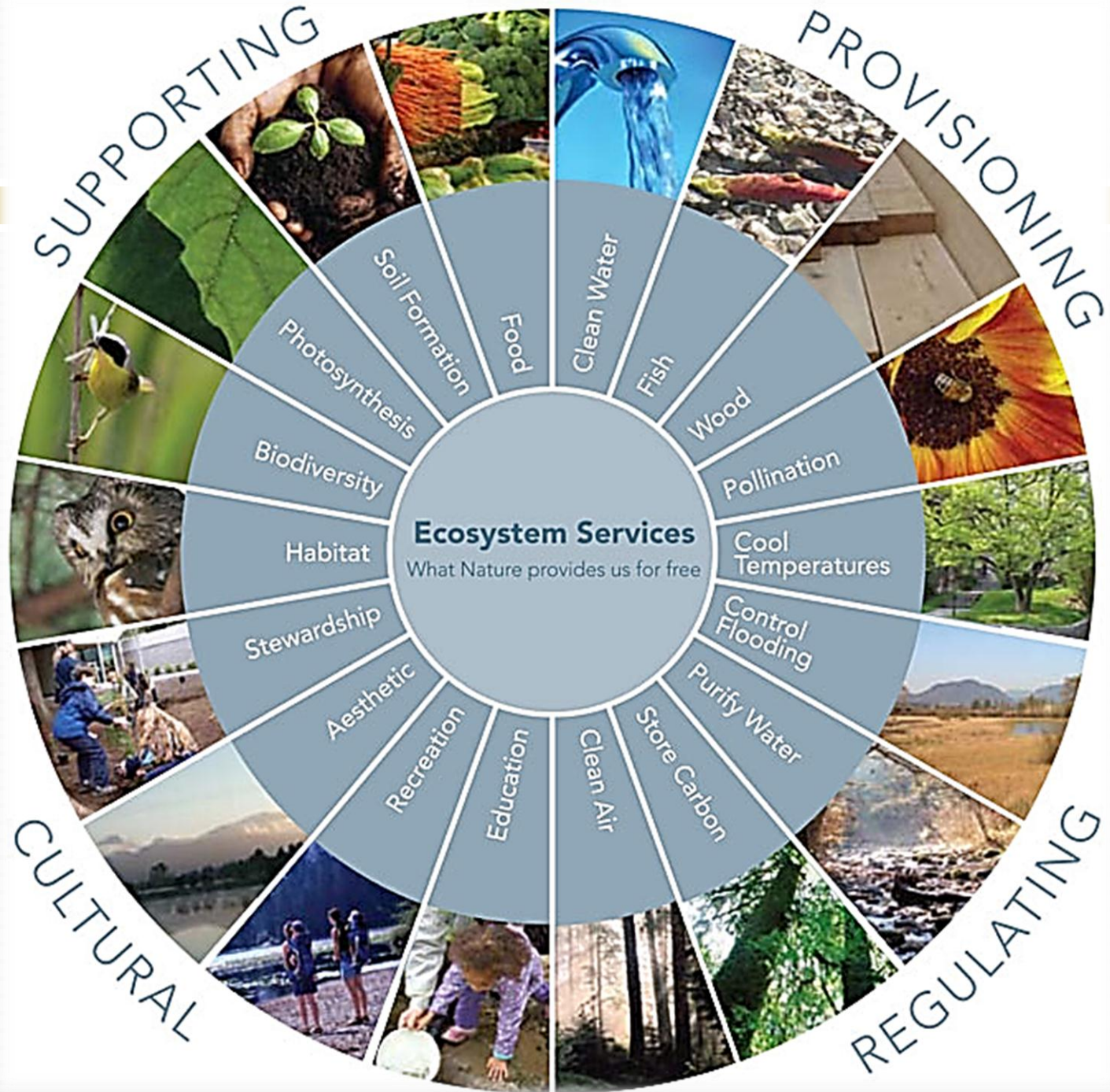
PERPINDAHAN B3 (BAHAN BERBAHAYA DAN BERACUN) MELINTASI BATAS NEGARA

- Polusi tidak mengenal batas negara
- Negara Industri mengeksport limbah ke negara berkembang
- AS merupakan negara pengekspor limbah B3 terbesar di dunia yi mencapai 264 juta ton setiap tahunnya, terdiri atas residu logam berat dan senyawa organik. Untuk membersihkan sekitar 2000 – 10.000 tempat limbah, AS mengeluarkan dana 20 sd 100 milyar dolar US.
- PP No. 18 Tahun 1999 Jo PP No 85 Tahun 1999, Limbah B3 adalah suatu sisa usaha dan/ atau kegiatan yang mengandung bahan berbahaya dan atau beracun karena sifat atau konsentrasinya dan/atau jumlahnya, baik secara langsung dan tidak langsung dapat mencemarkan dan/atau merusakkan lingkungan hidup, kesehatan, kelangsungan hidup manusia dan makhluk lain.

JASA EKOSISTEM

31

- ❑ Ekosistem menyediakan beragam jasa ekosistem yang penting untuk manusia dan makhluk hidup lainnya
- ❑ Jasa ekosistem yang dihasilkan memiliki nilai penting kehidupan makhluk hidup dan lingkungannya
- ❑ Kerusakan ekosistem akan mempengaruhi kualitas jasa ekosistem yang dihasilkannya



MOUNTAIN AND POLAR

Food
Fiber
Fresh water
Erosion control
Climate regulation
Recreation and ecotourism
Aesthetic values
Spiritual values

INLAND WATER Rivers and other wetlands

Fresh water
Food
Pollution control
Flood regulation
Sediment retention
and transport
Disease regulation
Nutrient cycling
Recreation and
ecotourism
Aesthetic values

CULTIVATED

Food
Fiber
Fresh water
Dyes
Timber
Pest regulation
Biofuels
Medicines
Nutrient cycling
Aesthetic values
Cultural heritage

COASTAL

Food
Fiber
Timber
Fuel
Climate regulation
Waste processing
Nutrient cycling
Storm and wave protection
Recreation and ecotourism
Aesthetic values

FOREST AND WOODLANDS

Food
Timber
Fresh water
Fuelwood
Flood regulation
Disease regulation
Carbon sequestration
Local climate regulation
Medicines
Recreation
Aesthetic values
Spiritual values

DRYLANDS

Food
Fiber
Fuelwood
Local climate regulation
Cultural heritage
Recreation and ecotourism
Spiritual values

URBAN Parks and gardens

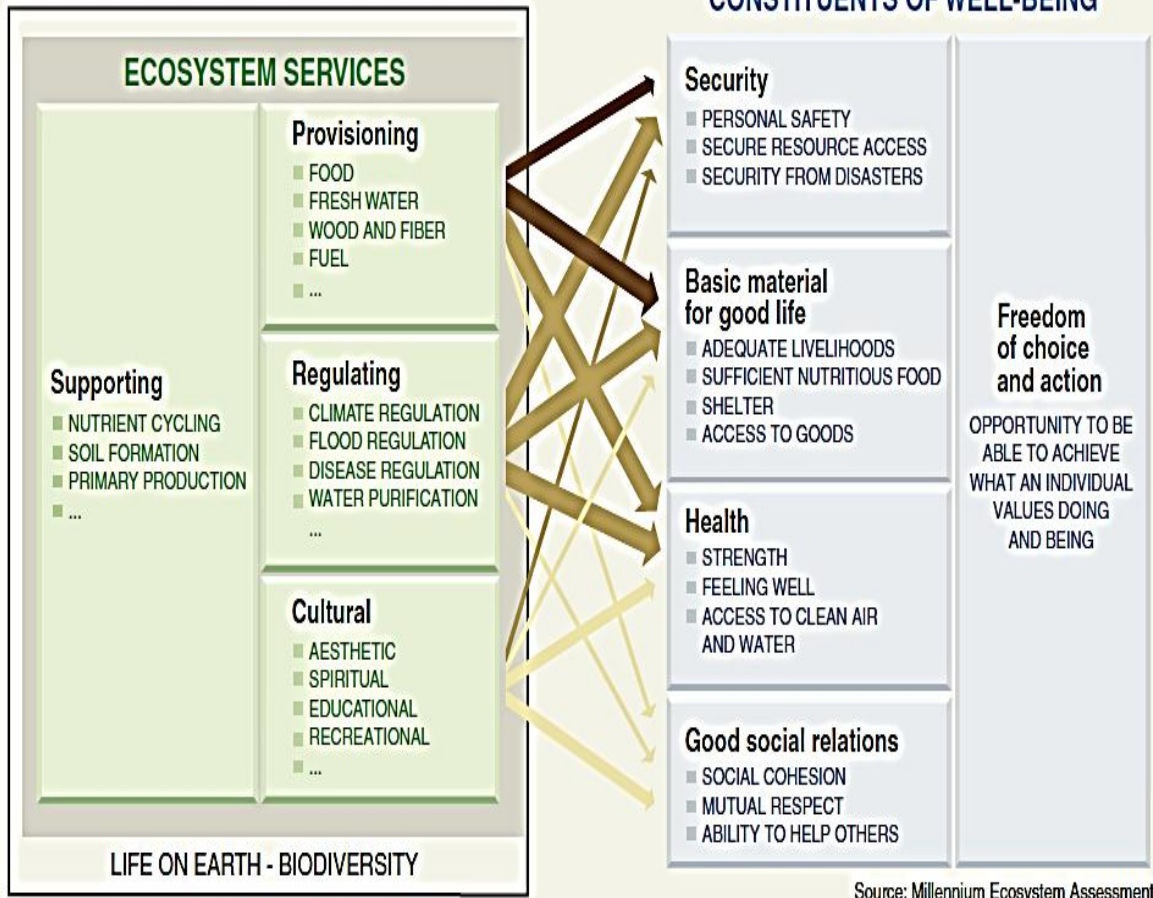
Air quality regulation
Water regulation
Local climate regulation
Cultural heritage
Recreation
Education

MARINE

Food
Climate regulation
Nutrient cycling
Recreation

ISLAND

Food
Fresh water
Recreation
and ecotourism

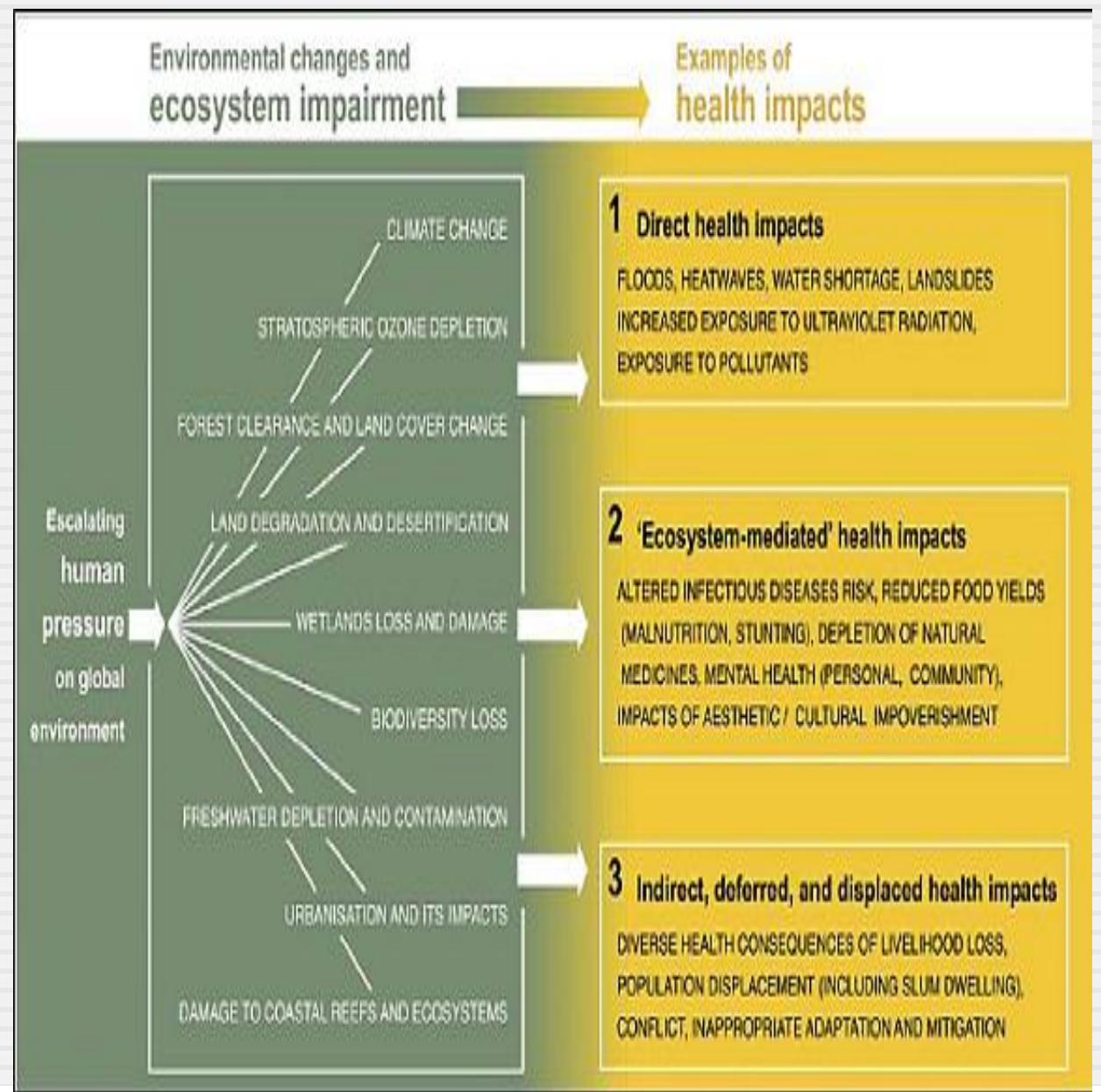


ARROW'S COLOR
Potential for mediation by socioeconomic factors

- Low
- Medium
- High

ARROW'S WIDTH
Intensity of linkages between ecosystem services and human well-being

- Weak
- Medium
- Strong



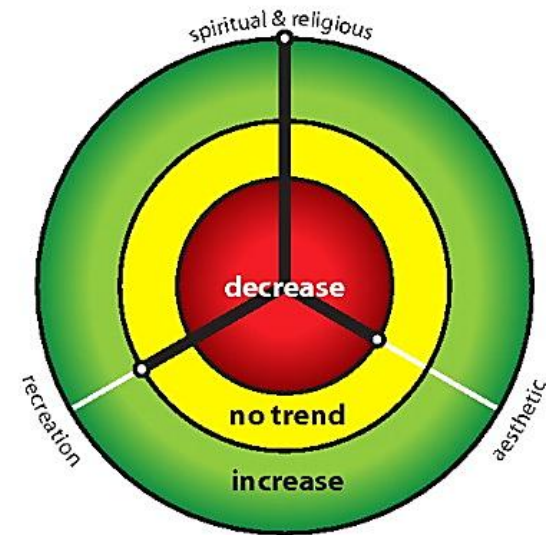
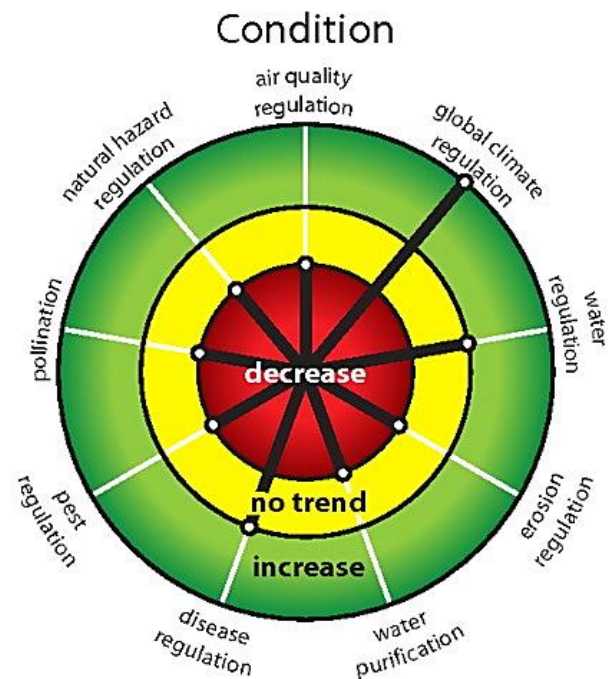
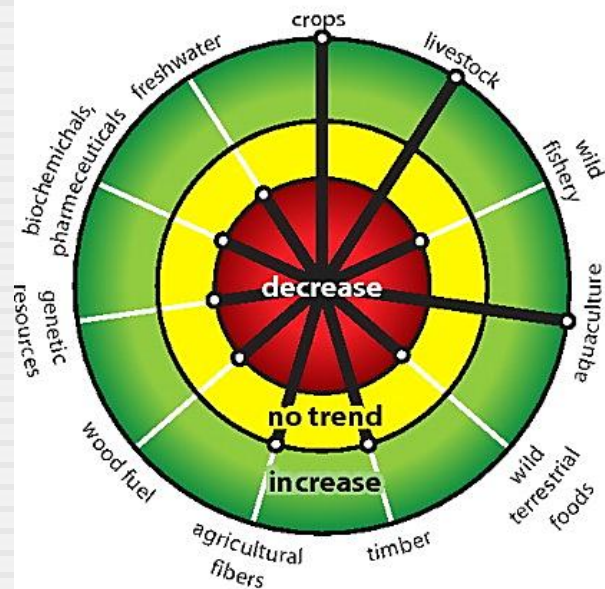
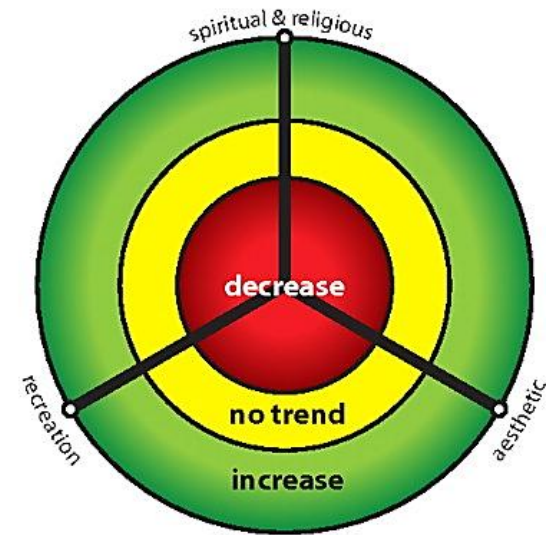
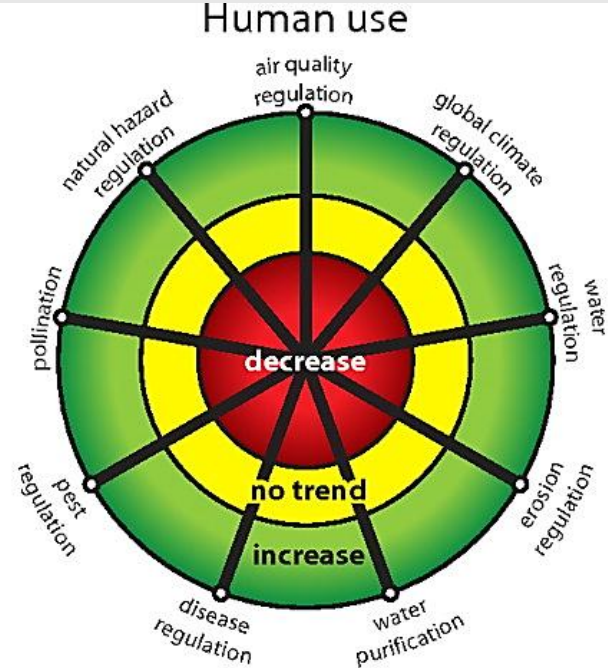
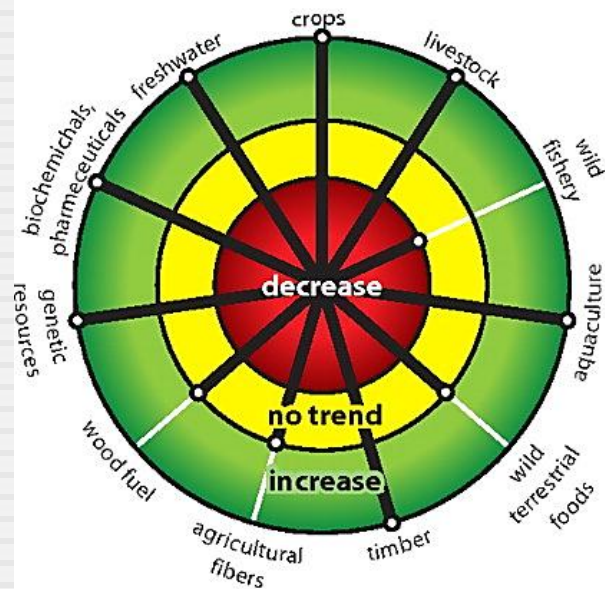
Jasa Ekosistem dan Kesejahteraan

HUMAN USE and ECOSYSTEM SERVICES CONDITION.

Provisioning, regulating, or cultural ecosystem services are shown in *Left, Center, and Right*, respectively. Length of black radial lines shows **the degree of change in human use or condition of the service.**

Source : Carpenter S R et al. PNAS 2009;106:1305-1312

³⁴*) PNAS : Proceedings of the National Academy of Sciences of the United States of America



Provisioning services

Regulating services

Cultural services

Service	Sub-category	Status	Notes
Provisioning Services			
Food	crops	▲	substantial production increase
	livestock	▲	substantial production increase
	capture fisheries	▼	declining production due to overharvest
	aquaculture	▲	substantial production increase
	wild foods	▼	declining production
Fiber	timber	+/-	forest loss in some regions, growth in others
	cotton, hemp, silk	+/-	declining production of some fibers, growth in others
	wood fuel	▼	declining production
Genetic resources		▼	lost through extinction and crop genetic resource loss
Biochemicals, natural medicines, pharmaceuticals		▼	lost through extinction, overharvest
Fresh water		▼	unsustainable use for drinking, industry, and irrigation; amount of hydro energy unchanged, but dams increase ability to use that energy

Regulating Services			
Air quality regulation		▼	decline in ability of atmosphere to cleanse itself
Climate regulation	global	▲	net source of carbon sequestration since mid-century
	regional and local	▼	preponderance of negative impacts
Water regulation		+/-	varies depending on ecosystem change and location
Erosion regulation		▼	increased soil degradation
Water purification and waste treatment		▼	declining water quality
Disease regulation		+/-	varies depending on ecosystem change
Pest regulation		▼	natural control degraded through pesticide use
Pollination		▼ ^a	apparent global decline in abundance of pollinators
Natural hazard regulation		▼	loss of natural buffers (wetlands, mangroves)
Cultural Services			
Spiritual and religious values		▼	rapid decline in sacred groves and species
Aesthetic values		▼	decline in quantity and quality of natural lands
Recreation and ecotourism		+/-	more areas accessible but many degraded

Penutup : Renungkan Puisi Suku India berikut ini...

Only After The Last Tree Has Been Cut Down,
Only After The Last River Has Been Poisoned,
Only The Last Fish Has Been Caught,

**ONLY THEN WILL YOU FIND THAT
MONEY CAN NOT BE EATEN.....**