

GRIPS Development Forum Workshop

How can Japan effectively support economic growth in Africa?

Tokyo, 2008.07.25

Japan's support to Africa's economic growth in the age of global climatic change

- Challenges and opportunities -

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Self introduction: Prof. Dr. Alfred Kazadi SANGA-NGOIE

- Nationality Dem. Rep. of Congo (ex-Zaire), Africa
- 1952.04.08 Born in Likasi City, Dem. Rep. of Congo (ex-Zaire)
- 1982.04.11 Arrival in Japan.
Osaka Gaidai (Foreign Students Division)
- 1989.03.23 Doctor of Sciences (Geophysics)
Graduate School of Sciences, Kyoto University
- 1993.04.01 Associate Professor, Mie University
- 1995.04.01 Professor, Mie University (Fac. of Education)
- 1996.04.01 Professor, Mie University (Fac. of Bioresources)
Professor, Grad. School of Bioresources, Mie Univ.
- 2007.04.01 Professor, Ritsumeikan Asia Pacific University
- 2008.06.13 Professor Emeritus, Mie University



- Dean, International Cooperation and Research Division, APU
- Vice-Dean, Institutes Headquarters, APU
- Founder and Chairman: -SAVE AFRICA PROJECT (NPO) (Japan, 1989)
- The SANGA FOUNDATION (Legal Status in DRC, 1994)

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1. Introduction
2. Global eco-climatic changes, impacts and risks in Africa
3. Japan's role in the Global village
4. Africa: the perfect partner for Japan?
5. Concluding remarks

Contents

1. Introduction

- End of Cold War
- New global order
- New issues: socio-economic, eco-climatic
- New Geopolitics, for survival

Contents

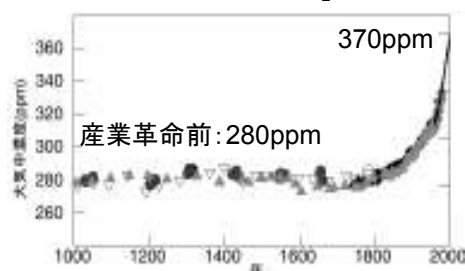
2. Global eco-climatic changes, impacts and risks in Africa

- Global warming
- Acid rains
- Stratospheric Ozone depletion
- Deforestation (rainforests) and lands degradation
- Tropospheric Ozone
- Coastal ecosystems

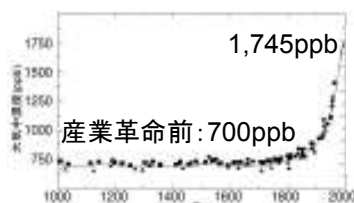
Changes in Atmospheric Greenhouse Gases

二酸化炭素: CO₂

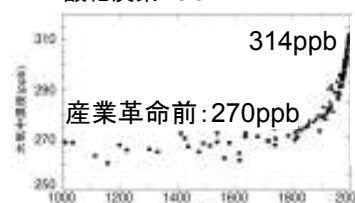
IPCC第三次報告書 (2007)



メタン: CH₄



一酸化炭素: CO



Global Warming

1. Fossil fuels: >85% of global energy source-

- production, economy, progress
- thermal electricity generation
- heating, transportation (cars), petrochemistry...

2. Deforestation

- forests development: plantations, ranches, timber, city building, golf court, industrial complex...
- shifting cultivation, fuelwood, bushfires
- acid rain



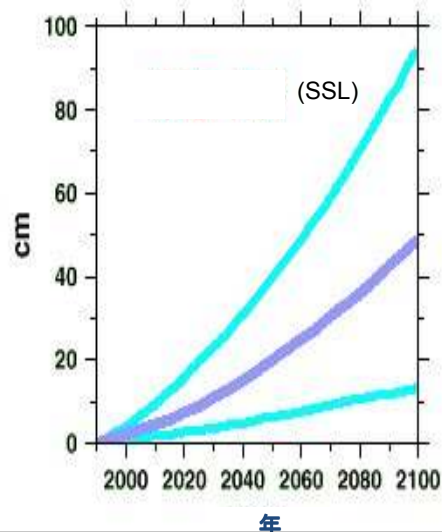
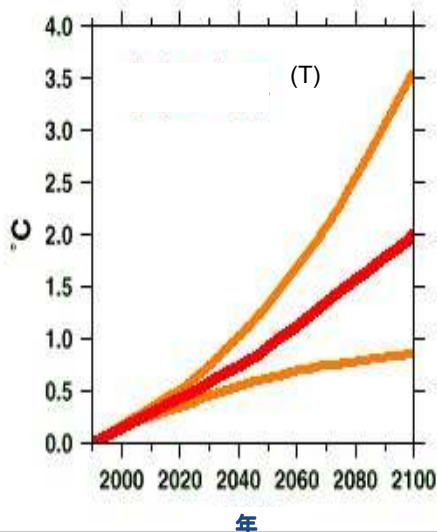
Fast increase of atmospheric CO₂

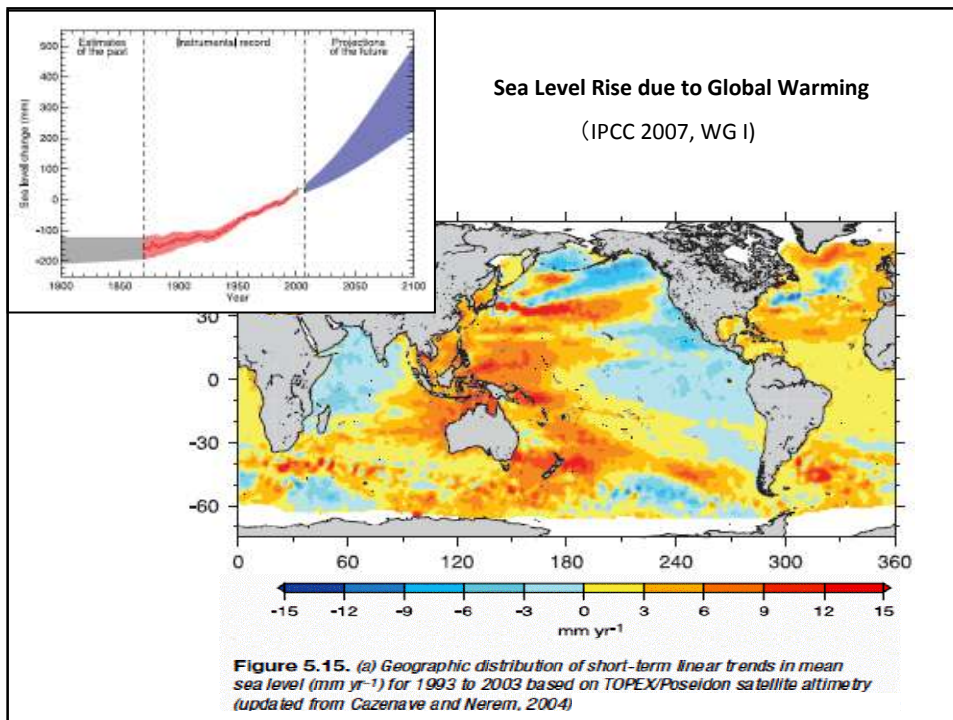
Global Warming



Global Mean Temp: 2°C up

Japan Summer temp.: 3-4°C up





Climate Change and Extreme Weathers



Frequent Typhoons, Severe Storms, Floods and Water Disasters

Land Cover Changes Upland

- Natural (fires , landslides, El Nino, foen)
- Climatic change and extreme weathers
- Land development by human activities



Heat Waves and Forests Fires,
Deforestation
Desertification, Drought and Famine

Global Warming, Air Pollution, Land Cover Change



1. Natural?

Man made?

2. Atmosphere?

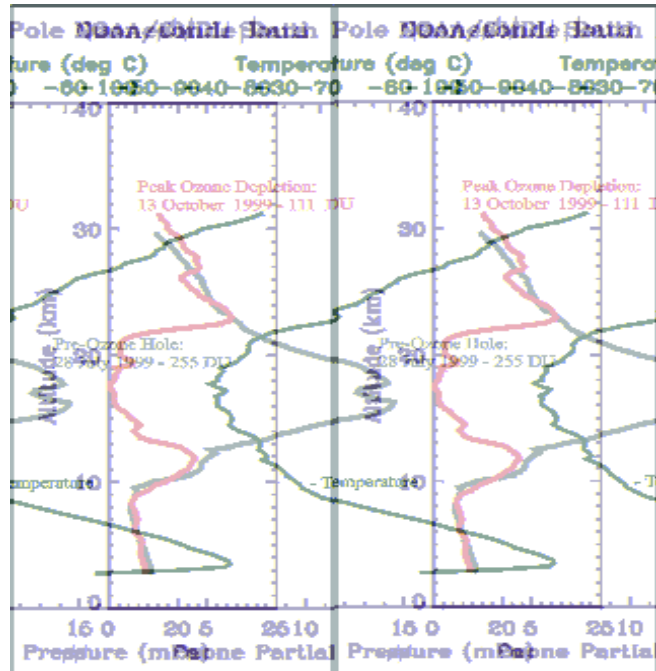
- Pollution
- Fossil fuel
- Cattle, bogs

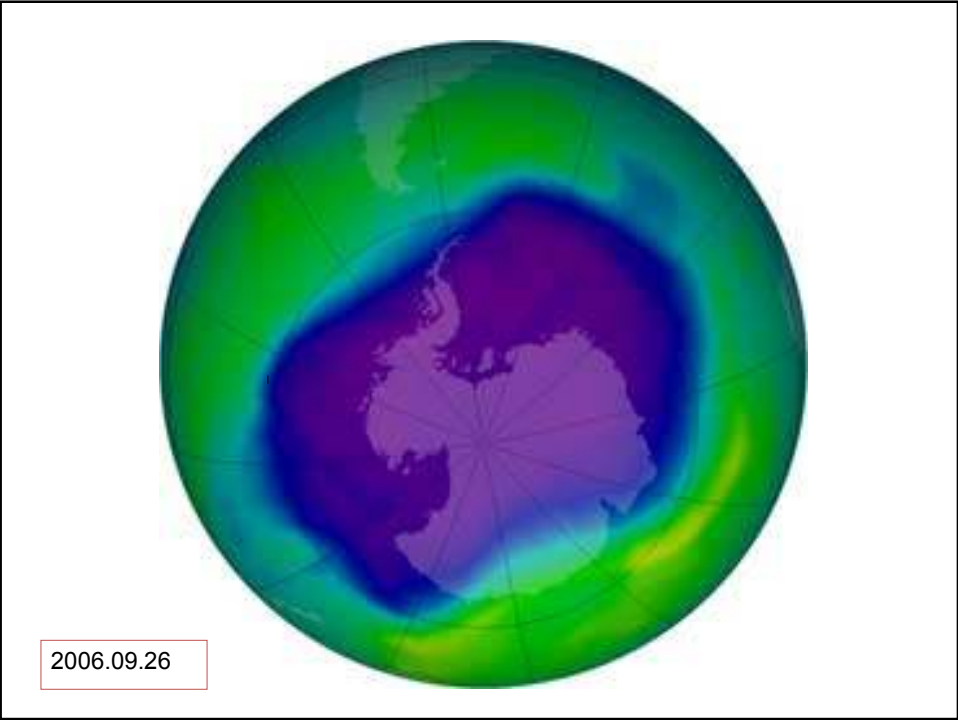
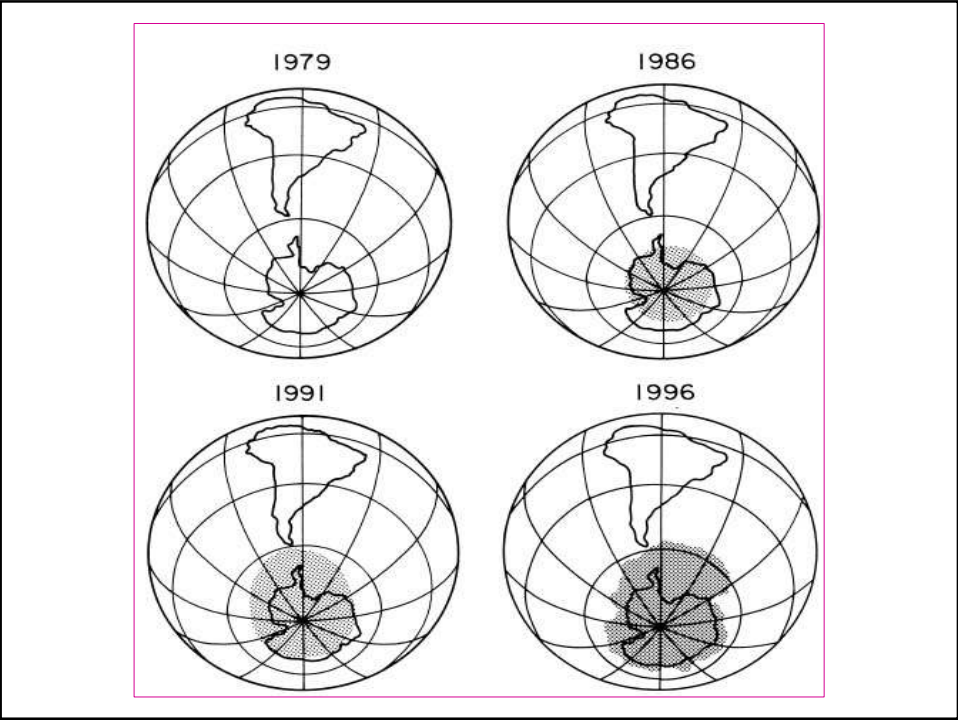
3. Land cover?

- Forests
- Land dev.
- Acid rains
- Snow cover



Acid Rains Effects

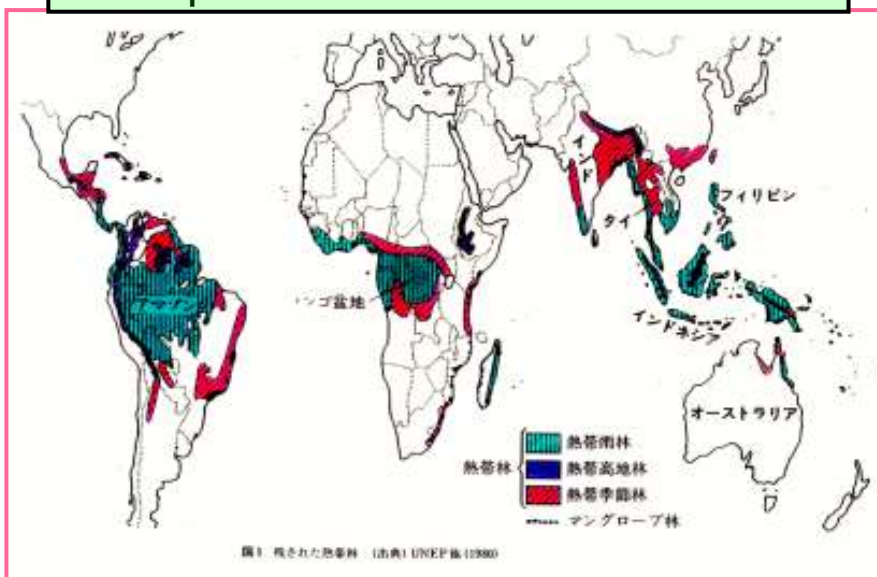











Damages related to the Stratospheric Ozone Depletion

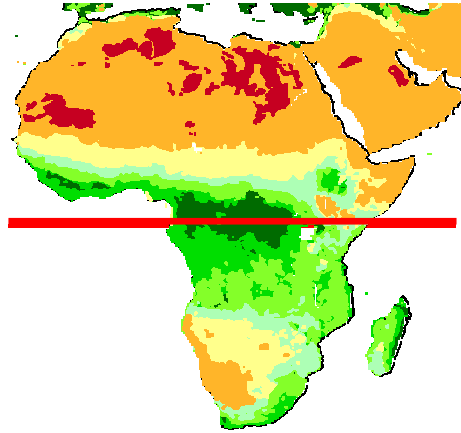
1. UV radiation increase (ground level)
2. Weathering, skin cancer increase
3. Eye damage/falling eyesight
4. DNA and other biogenetic disorder

Tropical rainforests and climate



African Digital Vegetation Model

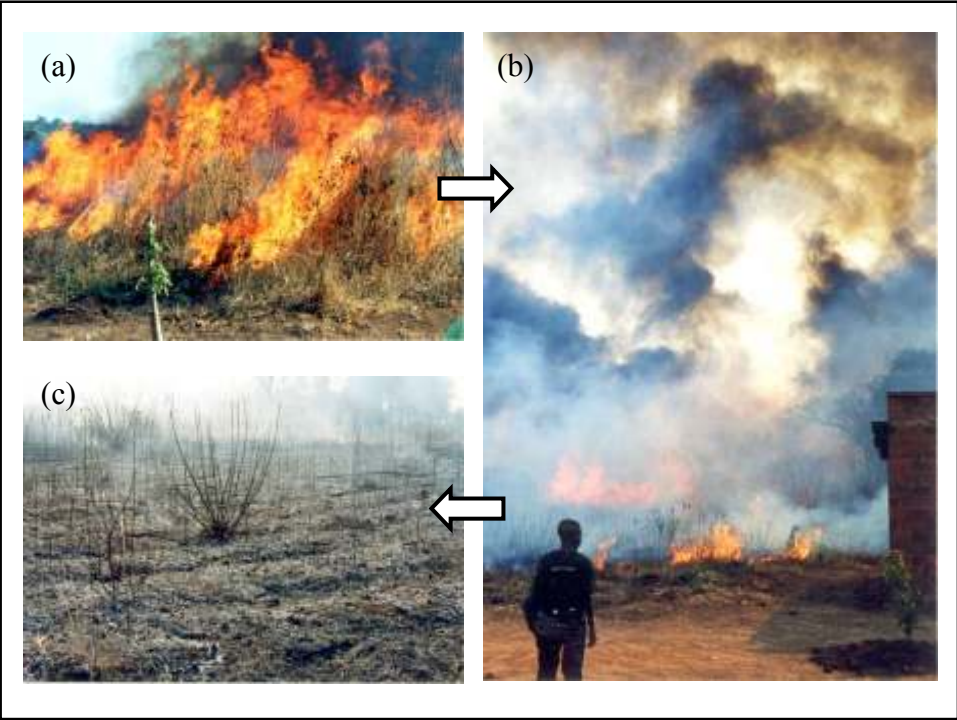
-  Evergreen rainforests
-  Moist rainforests
-  Dry rainforests
-  Grasslands
-  Arid Lands
-  Deserts
-  Sand dune deserts

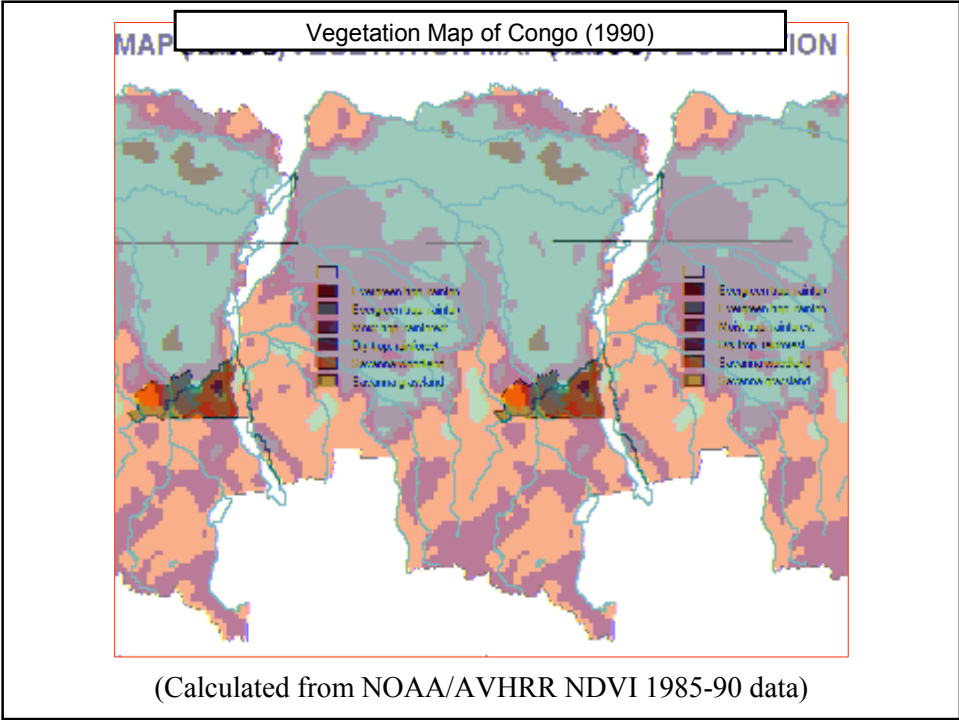
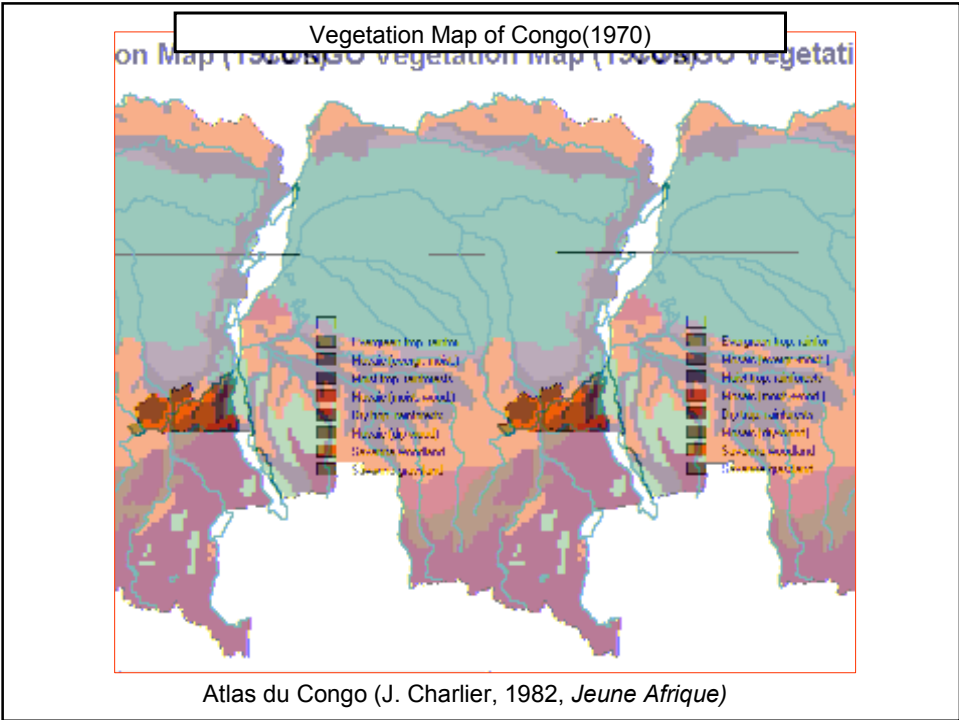


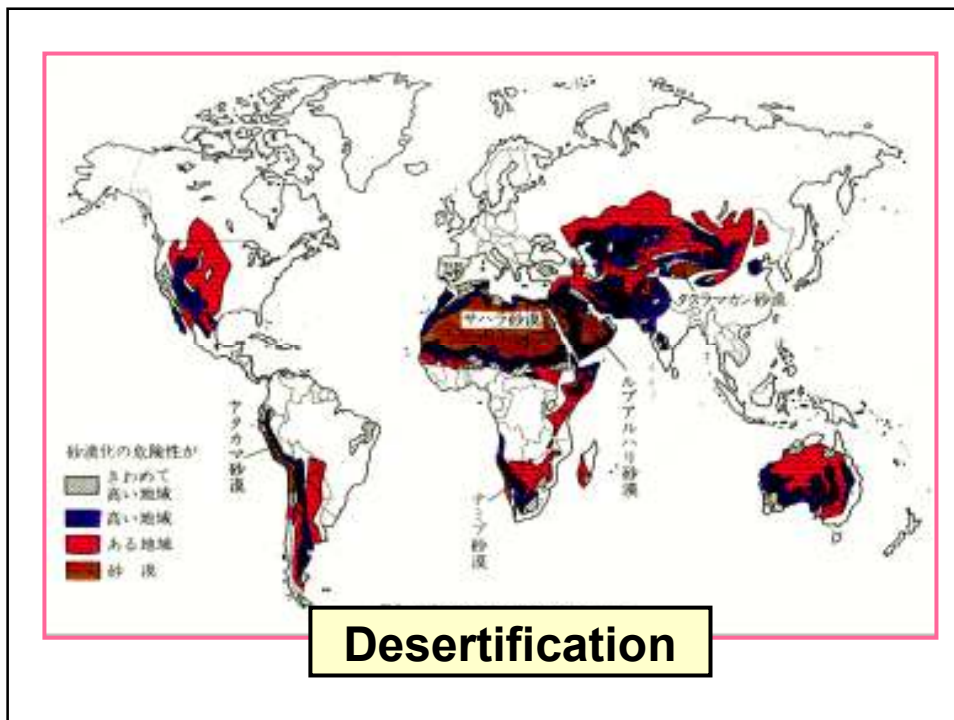
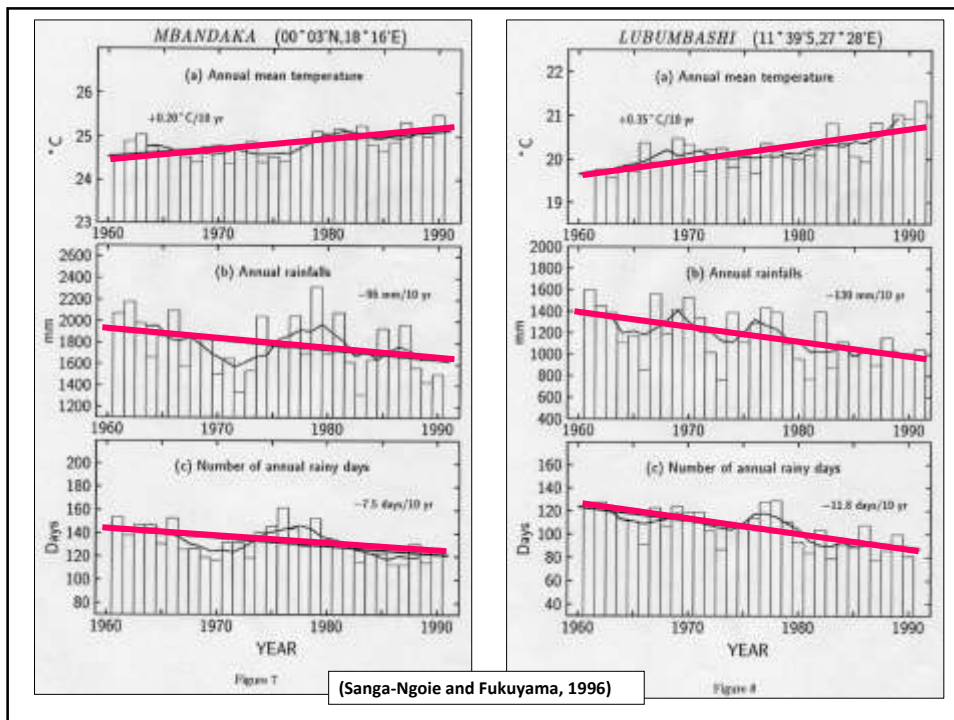
(Nonomura et al., 2002)

Slash and Burn Cultivation



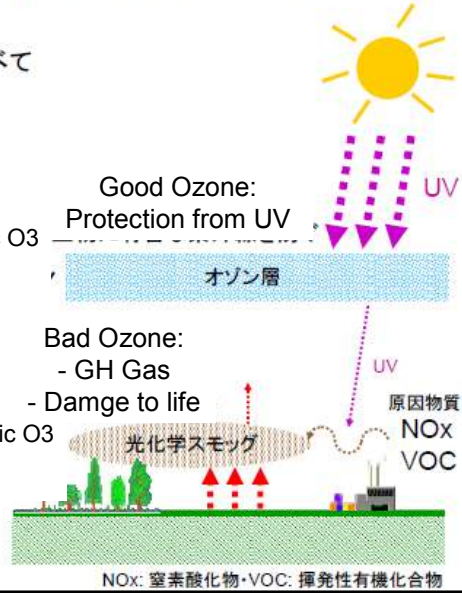
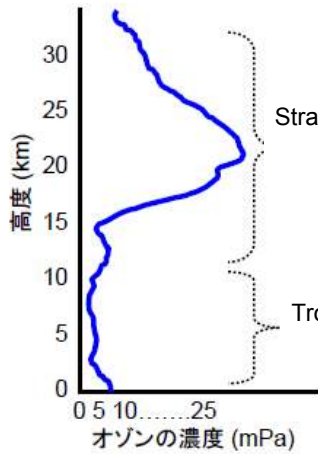






対流圏オゾンと成層圏オゾンの違い

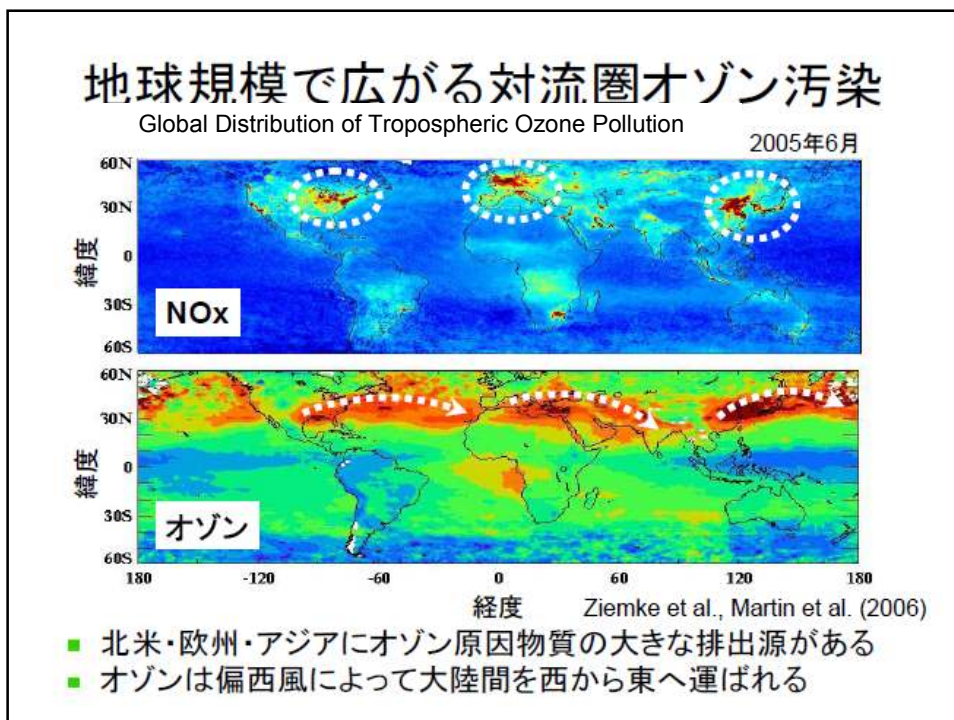
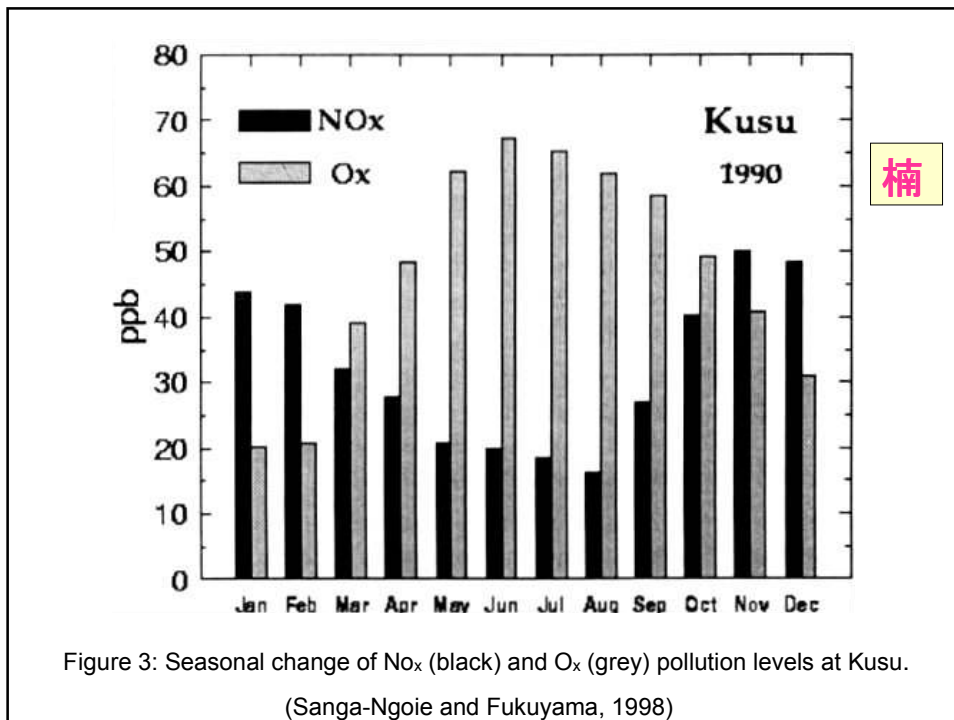
対流圏オゾンは成層圏オゾンと比べて
1/10の量しか存在しないが...



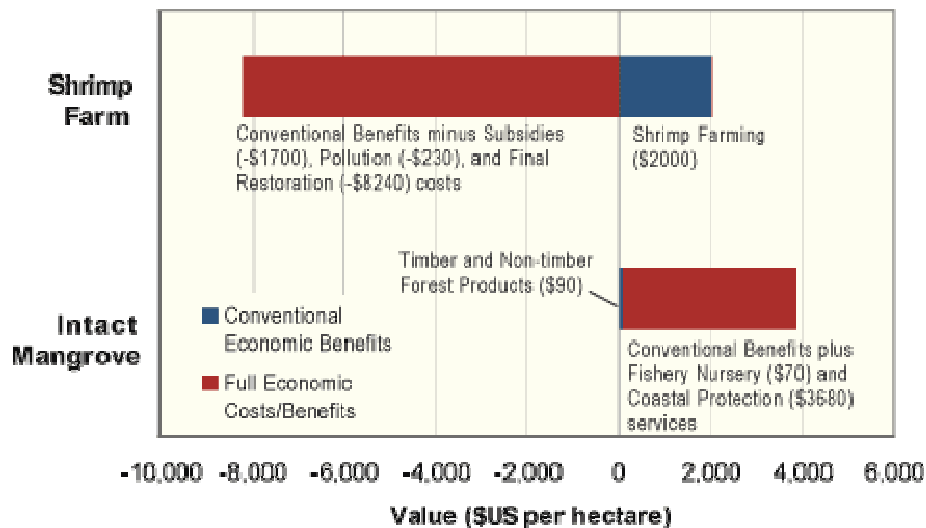
Ozone injury to milkweed.



Ozone injury to yellow-poplar.



The Cost of Mangrove Conversion in Southern Thailand



EarthTrends 2006. Source: Millennium Assessment 2005; Sathirathai and Barbier 2001.

Coastal Ecosystems



- Estuaries, wetlands, intertidal flats,
- Mangrove and swamp forests
- Lagoons, salt ponds, rocks and sand beaches
- Seagrass, coral reefs, continental shelf

Sustainable land-ocean-atmosphere flow of matter and energy




1. Biochemical cycle of all land-driven material entering the sea
2. Most of geochemical & biological activities in the biosphere
 - 15% of oceanic primary production
 - 80% of organic matter burial
 - 90% of sedimentary mineralization
3. 40% of World ecosystem service value and natural capital
4. Human population (40% within 100 km) and human activities

Increasing human population and man-made transformations

(Cape Town, South Africa)

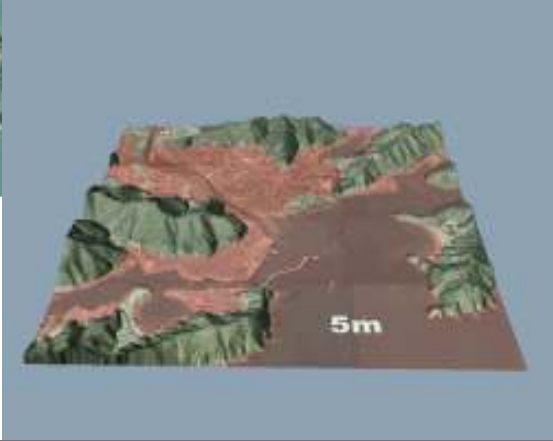


- 40% of world population living within 100 km from the ocean coasts
- Deep changes to the shape, contents and functions of the ecosystem
- Scenic shoreline cities, ports, resort beaches, land reclamation, etc...



Tsunami disaster simulation
Kii-Nagashima, Mie

95% of the Town submerged under a 5m wave



5m

→

- Awareness
- Preparedness
- Mitigation

Contents

3. Japan's role in the global village

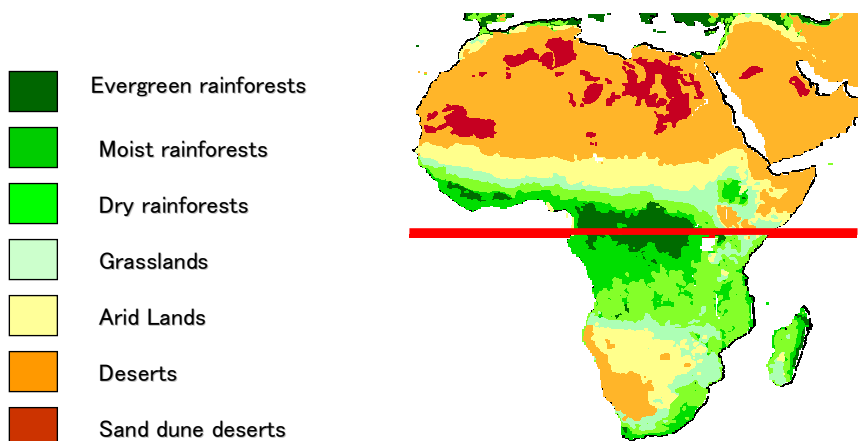
- Global awareness
- Environment-friendly technologies
 - production
 - communication
 - transportation
- Human capacity building
 - Professional training
 - Higher education (Graduate School)

Contents

4. Africa: the perfect partner for Japan?

- Historical background
- Mutual needs, mutual profits
 - infrastructure development?
 - untapped natural resources
 - vast lands favorable eco-climate
 - young and dynamic population
- **Political stability and accountability?**

African Digital Vegetation Model



(Nonomura et al., 2002)

Global Warming Mitigation

1. Global Approaches

COP3: Kyoto Protocol (京都議定書): 1997 Dec

2. Sustainable Energy Sources

- Solar Energy
- Wind Power
- Hydroelectricity

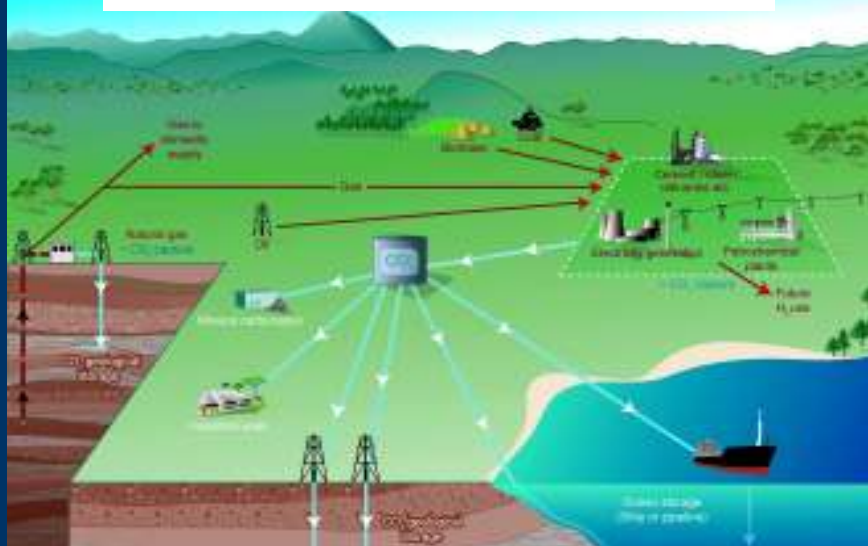


3. Envir. Friendly Technology & Lifestyle

4. Enhancing CO2 Sequestration by Forests

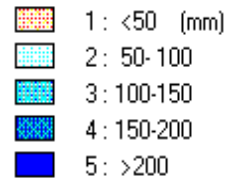
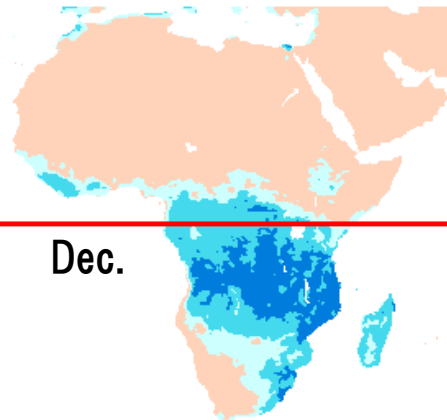
- Forests Management (森林管理)
- Reforestation (植林活動)

CO2 Sequestration in Oceans and Geosphere



SRCCS Figure TS-1

Monthly Rainfall



Dec.

Contents

5. Concluding remarks

- Africa: not only aid receiver, but business partner
- Africa: large market where Japan can buy and sell
- Africa needs first hand,
environment-friendly technologies
- New paradigm for ODA
involving Japan-Africa joint ventures?

Japan + Africa = Win-Win Partnership



The End

*Thank you very much
for your attention!*

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