

Ecosystem Services from Satoyama-like Landscape and Human Development

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Penang 1 October 2009

Outline of lecture

- Ecosystem Services/Biodiversity and Human Well-being
- Value (monetary & non-monetary) of Ecosystem Services
- Satoyama-like landscapes in Asia
- Where do we go from here?

Concept of “Ecosystem Services”
given credence with the findings
of the *Millennium Ecosystem
Assessment*
(2001 – 2005)



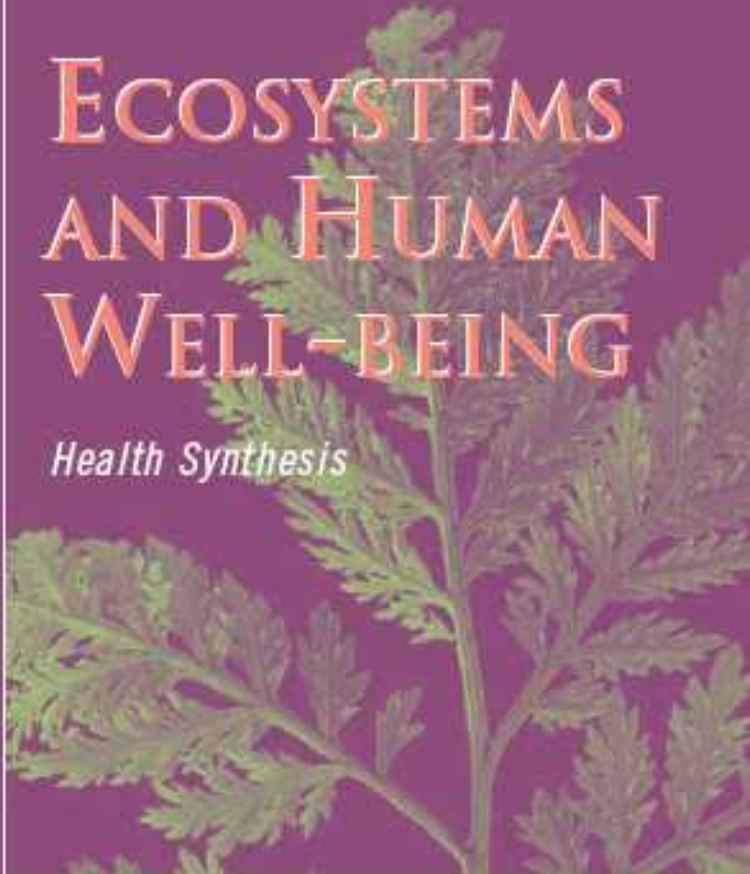


World Health
Organization



ECOSYSTEMS AND HUMAN WELL-BEING

Health Synthesis

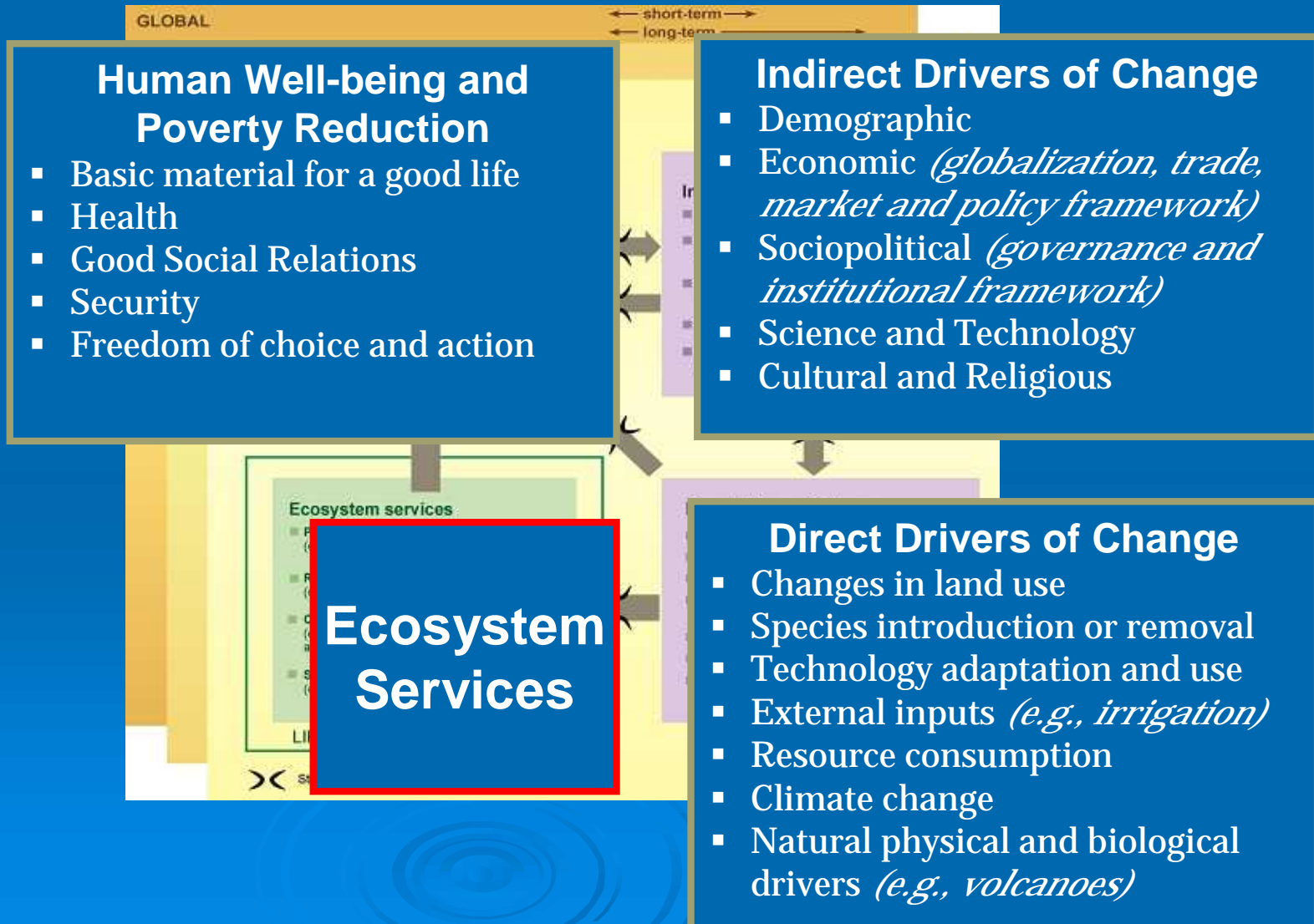


MILLENNIUM ECOSYSTEM ASSESSMENT



World Health
Organization

MA Framework



Largest assessment of the health of Earth's ecosystems

➤ Experts and Review Process

- Prepared by 1360 experts from 95 countries
- 80-person independent board of review editors
- Review comments from 850 experts and governments
- Includes information from 33 sub-global assessments

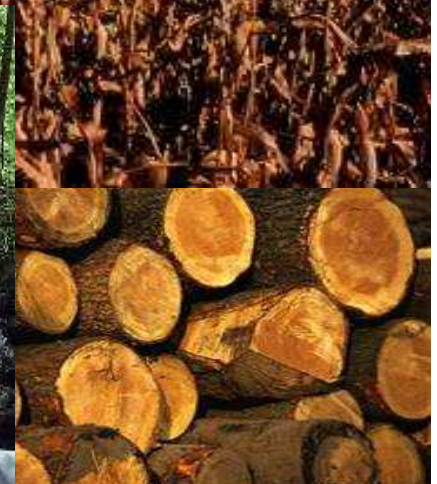
➤ Governance

- Called for by UN Secretary General in 2000
- Authorized by governments through 4 conventions
- Partnership of UN agencies, conventions, business, non-governmental organizations with a multi-stakeholder board of directors

Ecosystem Services = Benefits people obtain from ecosystems

➤ Provisioning Services

- Food
- Freshwater
- Wood fuel
- Timber
- Fiber
- Genetic Resources

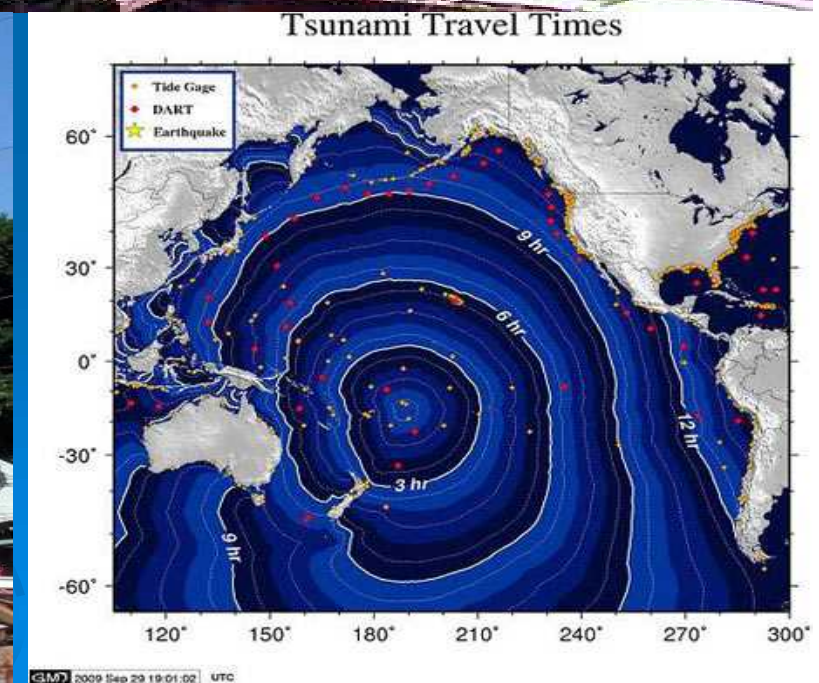


Ecosystem Services = Benefits people obtain from ecosystems

- Provisioning
Services
- Regulating
Services
 - Climate Regulation
 - Flood Regulation
 - Disease
Regulation
 - Water Purification

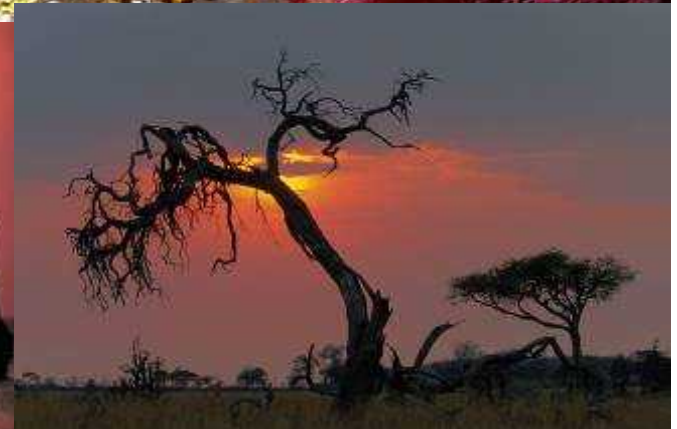


Tsunami in Pago Pago, 30/9/09

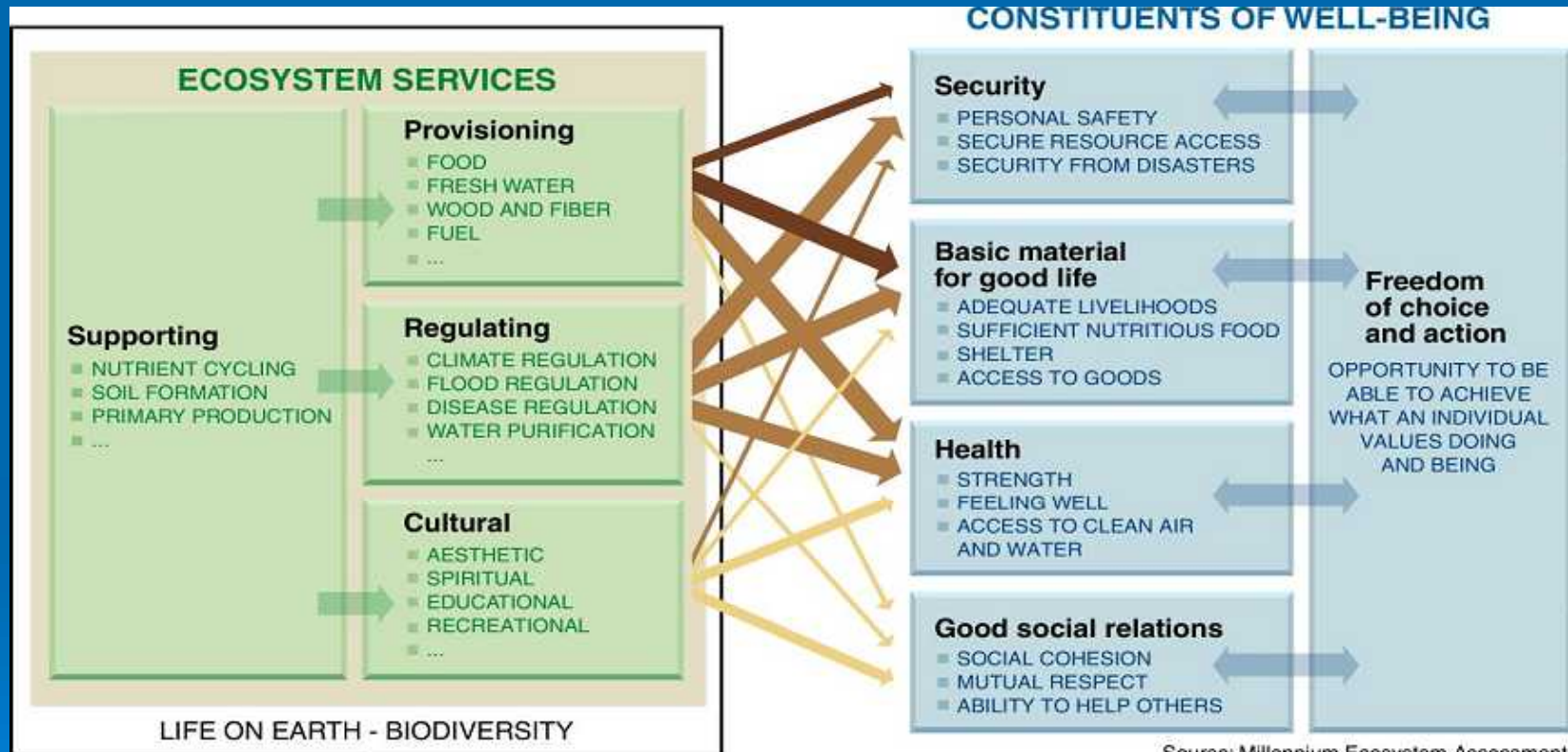


Ecosystem Services = Benefits people obtain from ecosystems

- Provisioning Services
- Regulating Services
- Cultural Services
 - Aesthetic
 - Spiritual
 - Educational
 - Recreational
 - Social Relations



Focus: Consequences of Ecosystem Change for Human Well-being



Source: Millennium Ecosystem Assessment

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

An aerial photograph of a vast, lush green forested mountain range. The terrain is characterized by rolling hills and deep valleys, all covered in dense, vibrant green vegetation. The sky above is filled with soft, white clouds, and the overall scene conveys a sense of natural beauty and ecological richness. A dark green horizontal bar is overlaid at the bottom of the image, containing the title text in yellow.

Biodiversity and Ecosystem Services Under Threat



MILLENNIUM ECOSYSTEM ASSESSMENT
ECOSYSTEMS AND
HUMAN WELL-BEING Synthesis

国連ミレニアム エコシステム評価

生態系サービスと 人類の将来

Millennium Ecosystem Assessment 編
横浜国立大学21世紀COE翻訳委員会 責任翻訳



OHM
Ohmsha

Findings from the MA

- Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fiber and fuel
- The changes that have been made to ecosystems have contributed to substantial net gains in human well-being and economic development, but these gains have been achieved at growing costs in the form of the degradation of many ecosystem services, increased risks of nonlinear changes, and the exacerbation of poverty for some groups of people

Findings from the MA

- The degradation of ecosystem services could grow significantly worse during the first half of this century and is a barrier to achieving the Millennium Development Goals
- The challenge of reversing the degradation of ecosystems while meeting increasing demands for their services can be partially met under some scenarios that the MA has considered but these involve significant changes in policies, institutions and practices, that are not currently under way



The balance sheet

	Enhanced	Degraded	Mixed
Provisioning	Crops Livestock Aquaculture Carbon sequestration	Capture fisheries Wild foods Wood fuel Genetic resources Biochemicals Fresh Water Air quality regulation Regional & local climate regulation	Timber Fiber Water regulation Disease regulation Recreation & ecotourism
Regulating		Erosion regulation Water purification Pest regulation Pollination Natural Hazard regulation	
Cultural		Spiritual & religious Aesthetic values	

Bottom Line: 60% of Ecosystem Services are Degraded

Nature loss bigger issue than current banking crisis

- A 2008 European Union-commissioned study has determined that the global economy is losing more money from the disappearance of forests than through the recent banking crisis
- The study puts the annual cost of forest loss at between 2 trillion dollars and 5 trillion dollars
- The figure comes from adding the value of the various services that forests perform, such as providing clean water and absorbing carbon dioxide.

The Economics of Ecosystems and Biodiversity

- The cost of natural decline dwarfs losses on the financial markets
- It's not only greater but it's also continuous, it's been happening every year, year after year,"
- So whereas Wall Street by various calculations has to date lost, within the financial sector, 1-1.5 trillion dollars, the reality is that at today's rate, we are losing natural capital at least between 2-5 trillion dollars every year

The Economics of Ecosystems and Biodiversity

- As forests decline, nature stops providing services which it used to provide essentially for free
- So, the human economy either has to provide them instead, perhaps through building reservoirs, building facilities to sequester carbon dioxide, or farming foods that were once naturally available.

Ecosystem Services Degradation also Impacts on Human Health



Why do Ecosystems Matter to Human Health?

- **Ecosystems are the planet's life-support systems - for the human species and all other forms of life**
- **Ecosystem services are indispensable to the well-being and health of people everywhere**
- **The causal links between environmental change and human health are complex because often they are indirect, displaced in space and time, and dependent on a number of modifying forces**

Why do ecosystems matter to human health?



- *Anopheles stephensi osquito, a known malaria vector, with a distribution from Egypt to China, obtaining a blood meal from a human host.*
- *In the wild, mosquito larvae are found in sites such as stream pools and margins, puddles, irrigation channels and springs.*
- *In urban areas the larvae are found in a wide variety of artificial containers including cisterns, wells, tubs and fountains.*

Why do ecosystems matter to human health?



Bark of white willow (Salix alba) was recommended as a pain reliever by the Ancient Greek physician, Hippocrates.

Salicin, the active ingredient in willow bark – similarly found in the spirea or meadowsweet plant (Filipendula ulmaria/Spiraea ulmaria) – was discovered in the early 1800s.

Aspirin® was introduced to the public in 1899, following synthesis of the salicin derivative: acetylsalicylic acid.

Is this the future ginseng of Malaysia ?

Some pertinent issues

- Wild population is depleting
- Large-scale cultivation is not successful
- Adulteration of products
- The fate of investment in MIT R & D?
- Role of SMI and Local industries?

Tongkat Ali (Eurycoma longifolias)



Basic Global Scenario, to 2050

- Population will increase, unevenly
- Energy use will approximate 2000 levels
- Food production must double
- Waste generation will escalate
- With current technologies and practices
 - Climate change will continue
 - More species will be lost, faster than ever
 - Nature's buffers will diminish (reefs, forests, mangroves, etc.)
 - Land degradation will continue
 - Fisheries will continue to decline/disappear
 - Oceans will become more acidic (CO₂ uptake)
 - Soils and waterways will undergo nitrification
 - Fresh water availability and quality will decline in many regions

These are our life-support systems. They provide the basic inputs and stability required for health and survival.

Back to Nature?



Satoyama

Satoyama Landscape



里地里山の保全・再生モデル事業イメージ



Satoyama & Satoumi

➤ The *ex-situ* benefits of *satoyama* and *satoumi* are significant. Services generated from *satoyama* and *satoumi* are enjoyed also by others beyond the immediate *satoyama* and *satoumi* setting. For instance, most of the rice, seaweed, fish, bamboo shoots, timber for housing and other services enjoyed by people in urban areas have their origin in rural *satoyama* and *satoumi* areas.

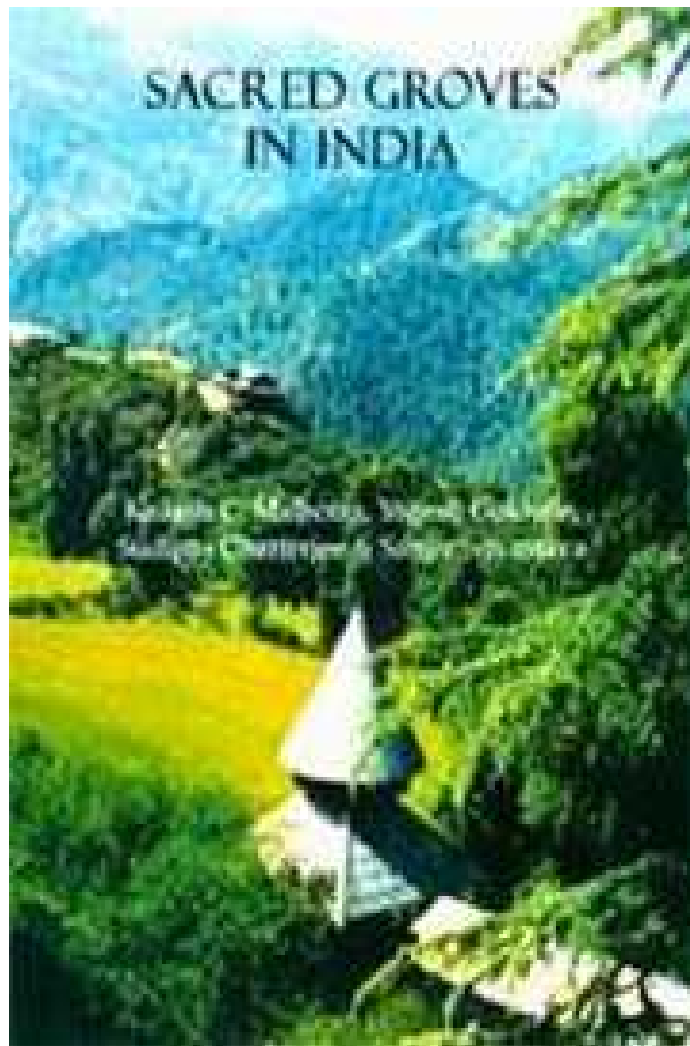
➤ The ecosystem services link the urban and rural areas together.

SOGO DEPARTMENT STORE, YOKOHAMA



SACRED GROVES IN INDIA

UNESCO
WORLD
HERITAGE



Sacred Groves

















Satoyama-like landscapes in Asia-Pacific

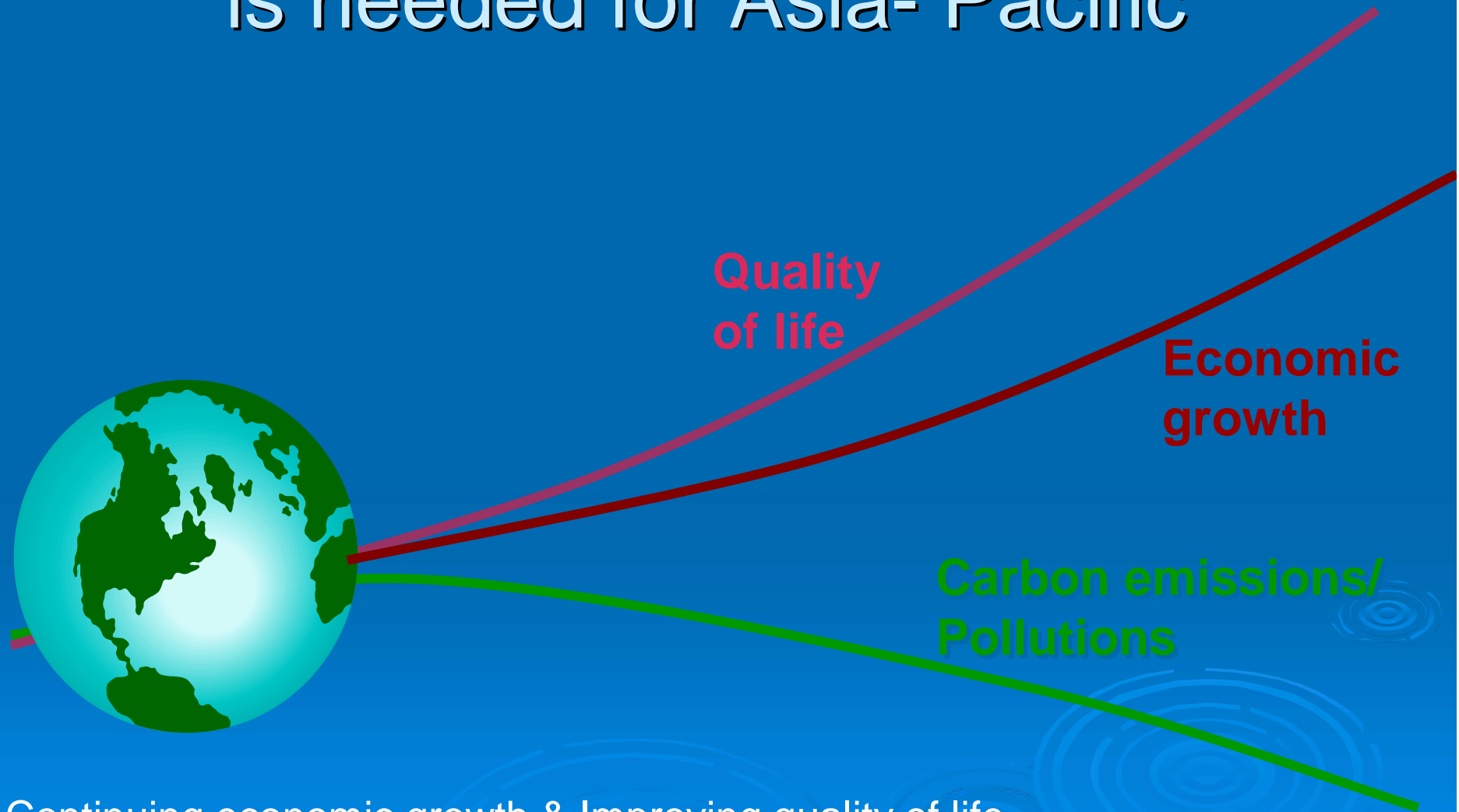
Cambodia	<i>Chamkar</i>	
Indonesia	<i>Hutan kepungan sialang pekarangan</i>	Melayu Riau
India	<i>Sacred groves</i>	
Malaysia	Kampong; desa	
Philippines	<i>muyong, uma, payuh</i>	<i>Ifugao/</i> indigenous people
Republic of Korea	<i>maeul/</i> <i>maeulsoop</i>	
Thailand	Satoyama-like landscape established by the King	





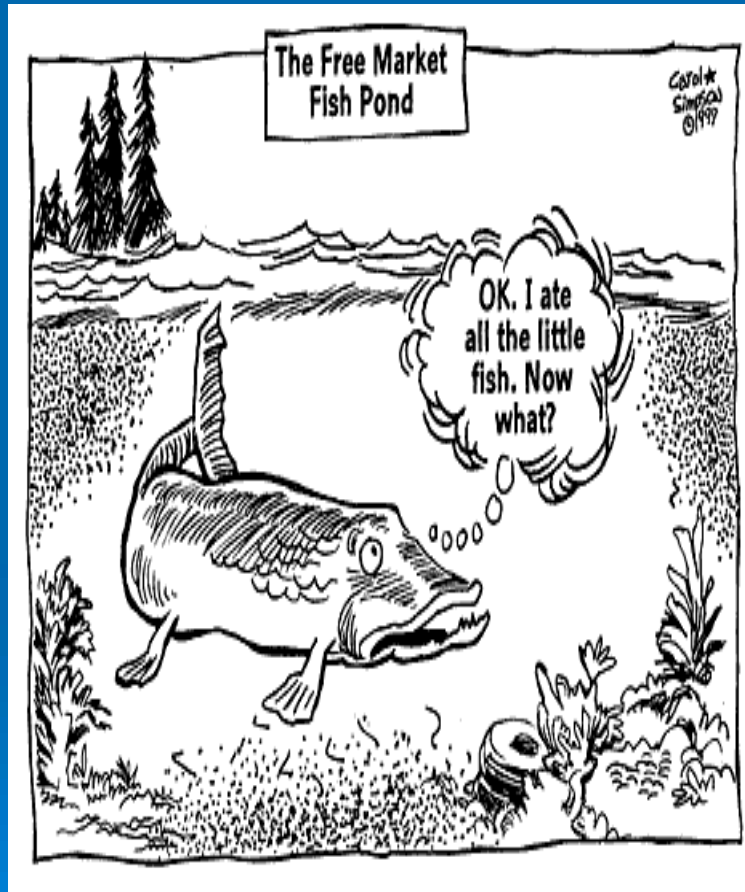


A new development paradigm is needed for Asia- Pacific



Continuing economic growth & Improving quality of life
without compromising limited ecological carrying capacity

Sustainability – One World One Planet



How can Sustainability be secured?

Sustainability needs to be secured through a social process involving all stakeholders in the communities. It should be a deliberative process that sets a dividing line between the moral and ethical values of preserving and managing the system in a sustainable manner.

Terima kasih

