



Millennium Ecosystem Assessment

Linking ecosystem services, biodiversity and human health

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Summary

- **Background to the Millennium Assessment**
- **Using the framework of the assessment to link biodiversity, ecosystem services and human wellbeing**
- **Looking into the future**
 - **Global assessment follow-up**
 - **Sub-global assessment follow up**

Biodiversity, ecosystems and people

- **Biodiversity is more than just species number**
 - Genetic diversity
 - Populations
 - Ecosystems



Biodiversity, ecosystems and people

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Human actions



Changes in biodiversity and ecosystems



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Changes in biodiversity and ecosystems



What are the consequences for human wellbeing?



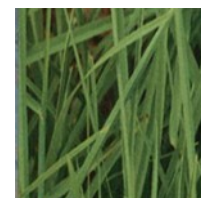
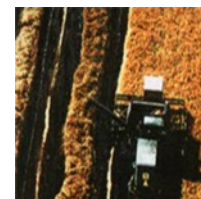
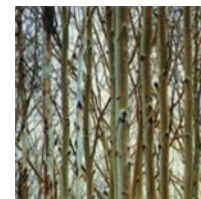
Biodiversity, ecosystems and people

- § What is the rate and scale of environmental change?
- § How do environmental changes affect the delivery of ecosystem services and human-well being?
- § How might ecosystems change over the next 50 years?
- § What options exist for maintaining the delivery of services and improving human well-being?



Biodiversity, ecosystems and people

- Data was collected between 2001 to 2005
- Prepared by 1360 experts from 95 countries
- Designed to meet the need of a wide range of audiences with a board including:
 - International institutions
 - Governments
 - Indigenous peoples
 - Businesses
 - Non Governmental Organisations

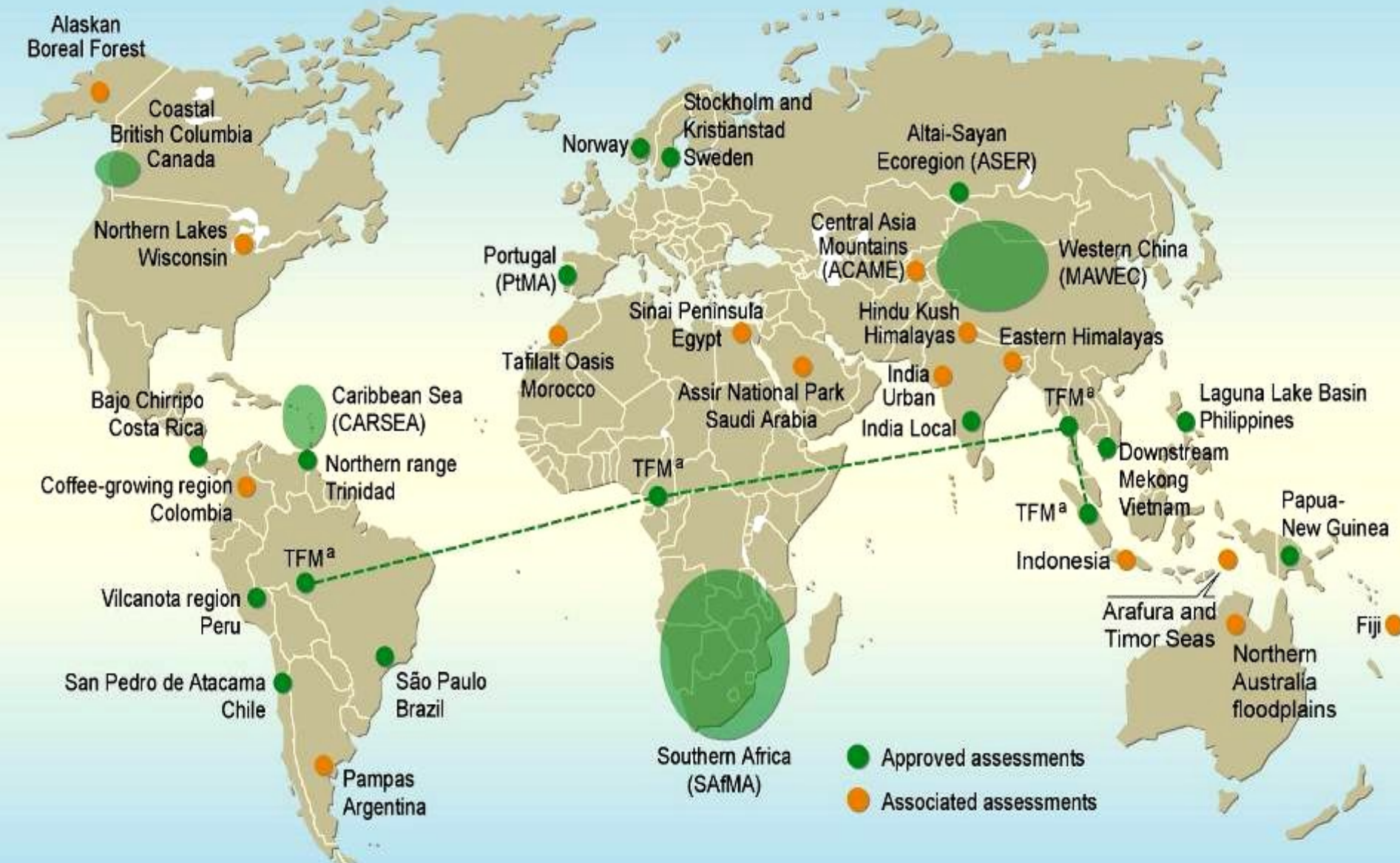


Biodiversity, ecosystems and people

- Resulted in the largest assessment ever undertaken of the health of ecosystems
- Interactions may occur at many different scales and can cross both time and space
- The Millennium Assessment therefore consisted of a **global assessment** and **33 sub-global assessments**



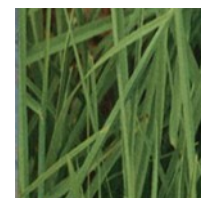
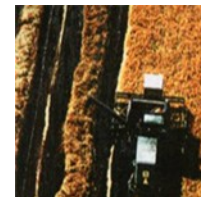
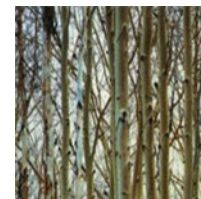
Sub-global assessments



^a Tropical Forest Margins

Conceptual framework

- **People, ecosystem and biodiversity are not independent of each other**
- **Framework of the assessment looks at interactions between:**
 - **Biodiversity and ecosystem services**
 - **Drivers of change**
 - **Human wellbeing**



Ecosystem services: Benefits people obtain from ecosystems

- **Provisioning services**
 - Food and medicine
 - Genetic resources
 - Freshwater
 - Wood fuel and timber



Ecosystem services: Benefits people obtain from ecosystems

- Provisioning services
- **Regulating services**
 - Climate regulation
 - Flood regulation
 - Water purification



Ecosystem services: Benefits people obtain from ecosystems

- Provisioning services
- Regulating services
- **Supporting services**
 - Nutrient cycling
 - Soil formation
 - Provision of habitat
 - Production of atmospheric oxygen



Ecosystem services: Benefits people obtain from ecosystems

- Provisioning services
- Regulating services
- Supporting services
- **Cultural services**
 - Aesthetic
 - Spiritual
 - Educational
 - Recreational
 - Social relations



Trade-offs among ecosystem services



Mangrove Services:

- nursery and adult fishery habitat
- fuelwood & timber
- traps sediment
- detoxifies pollutants
- protection from erosion & disaster

Mangrove ecosystem

Trade-offs among ecosystem services



Mangrove ecosystem



housing



shrimp



crops

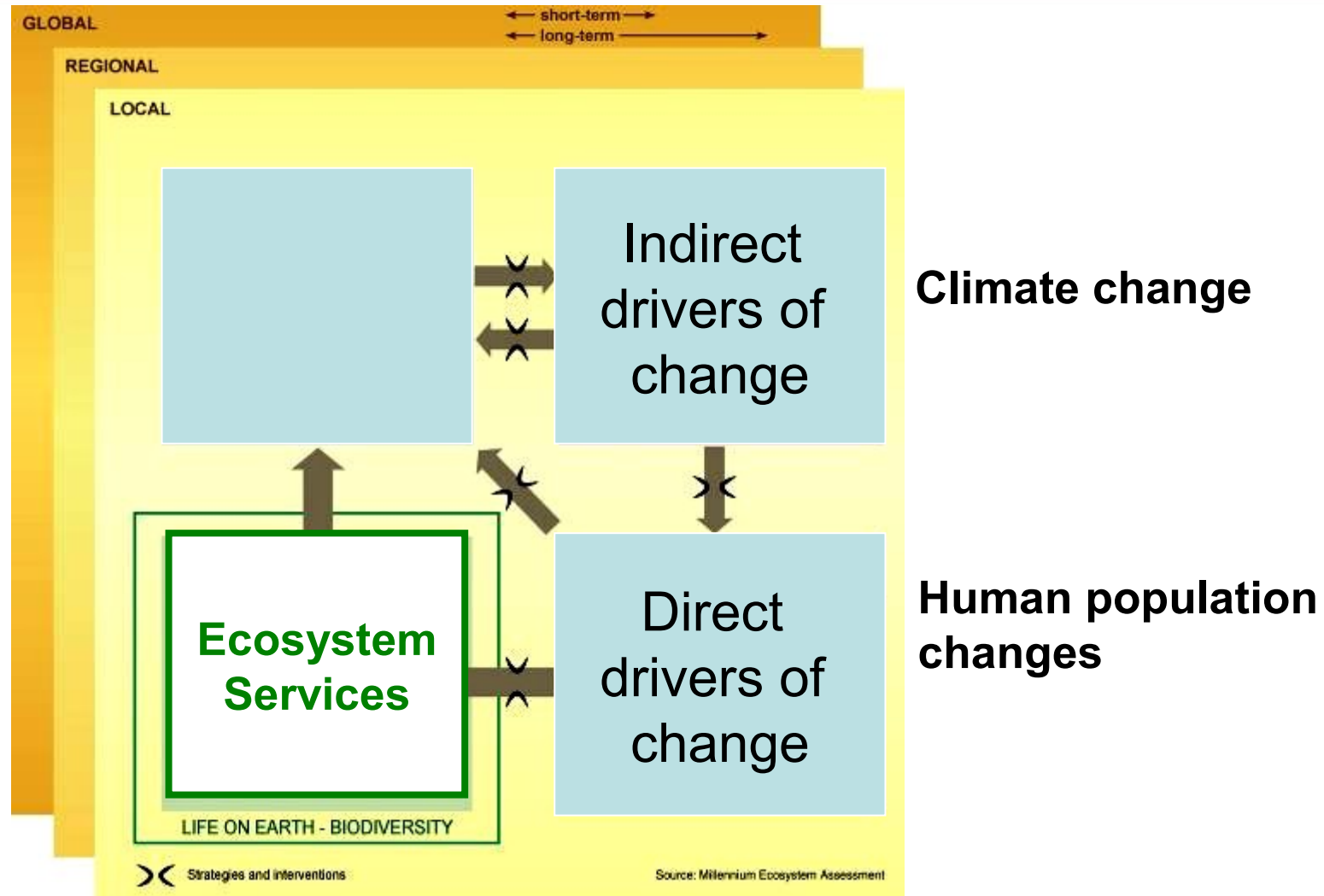
What drives changes in ecosystem services?

- **Ecosystems are dynamic**
- **Changes in ecosystem services may be due to:**
 - **Direct drivers**
 - **Human population changes**
 - **Economic**
 - **Science and technology**

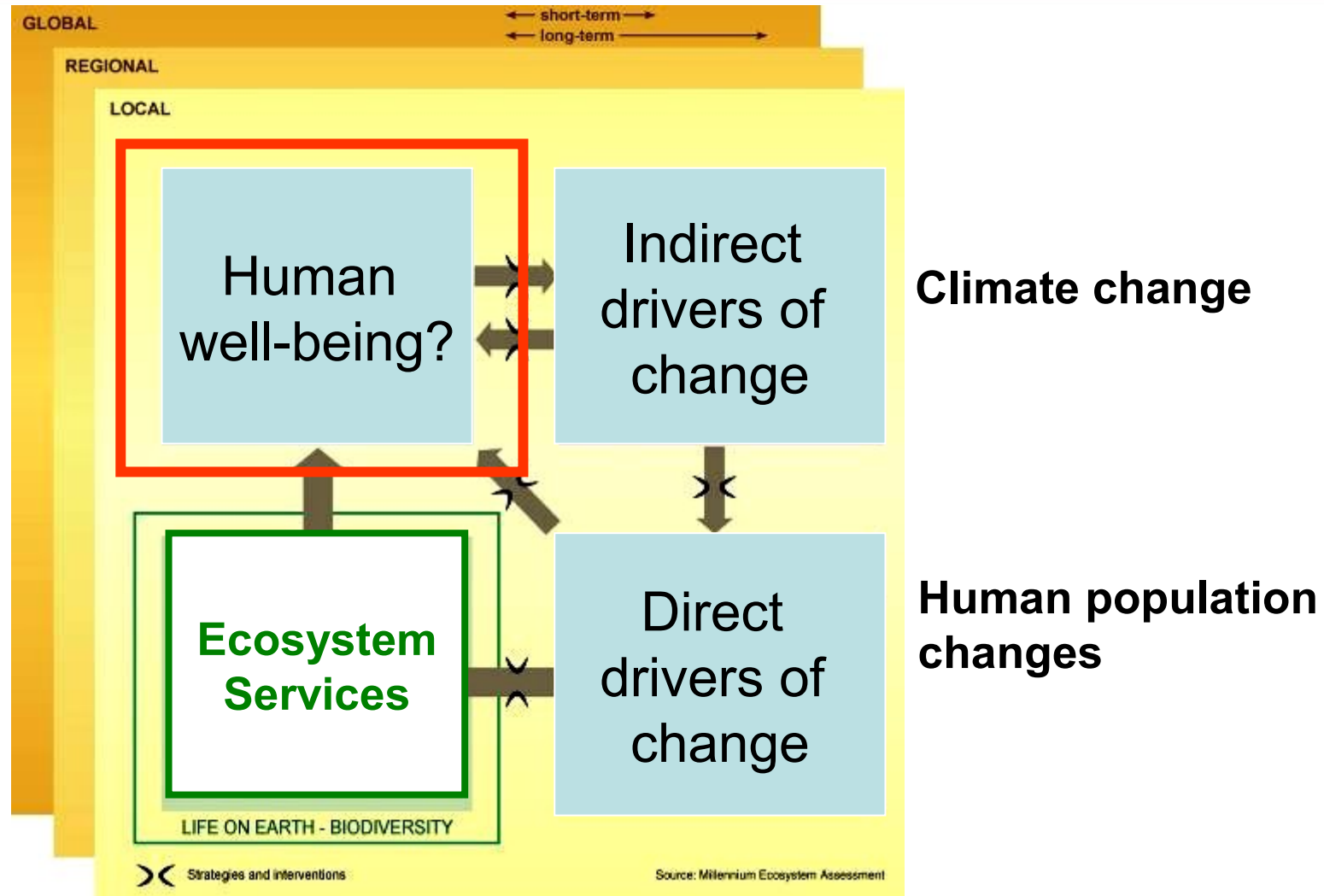
What drives changes in ecosystem services?

- **Ecosystems are dynamic**
- **Changes in ecosystem services may be due to:**
 - **Direct drivers**
 - Human population changes
 - Economic
 - Science and technology
 - **Indirect drivers**
 - Changes in land use
 - Species introduction or removal
 - Climate change

Conceptual framework



Conceptual framework



Human well-being

- **Millennium assessment defined wellbeing as:**
 - **Health**
 - **Good social relations**
 - **Security**
 - **Basic material for a good life**
 - **Freedom of choice and action**

Human well-being

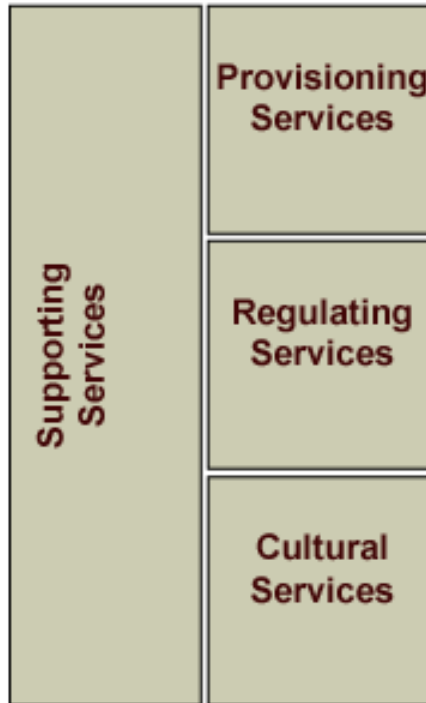
- **Millennium assessment defined wellbeing as:**
 - Health
 - Good social relations
 - Security
 - Basic material for a good life
 - Freedom of choice and action
- **How do these aspects of well-being link to biodiversity and ecosystem services?**

Links between biodiversity, ecosystem services and human well-being

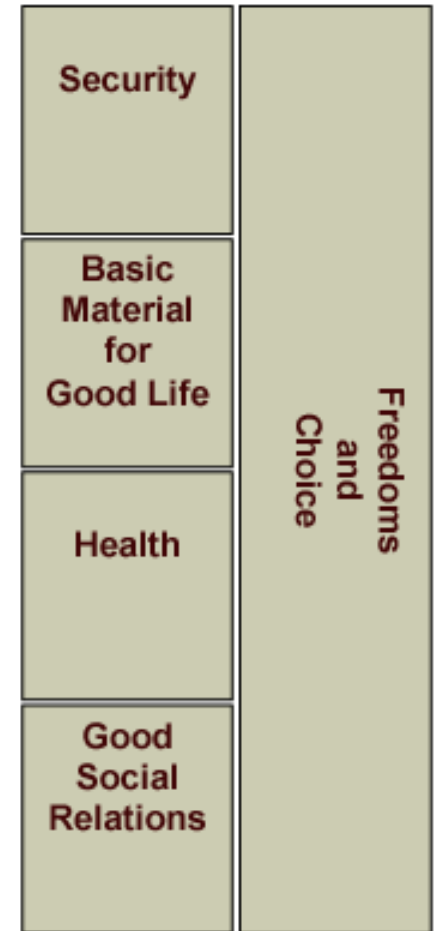
Biodiversity

Genes, Populations, Species,
Communities, Ecosystems

Ecosystem Services



Constituents of Well-being



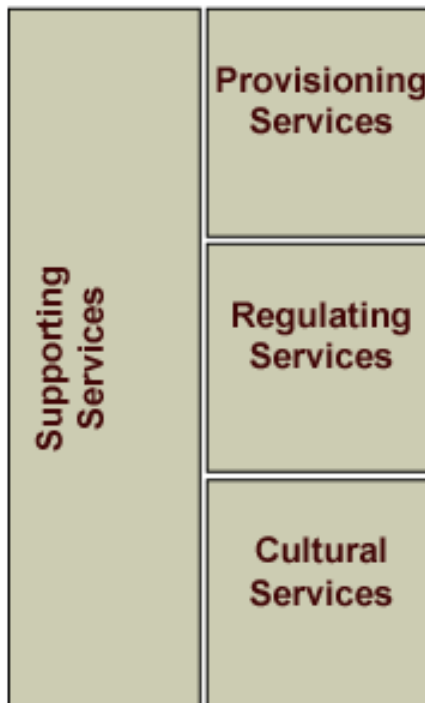
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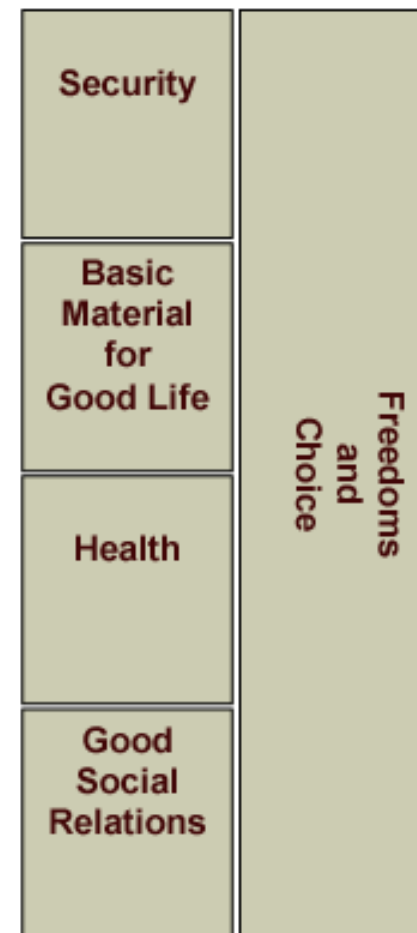
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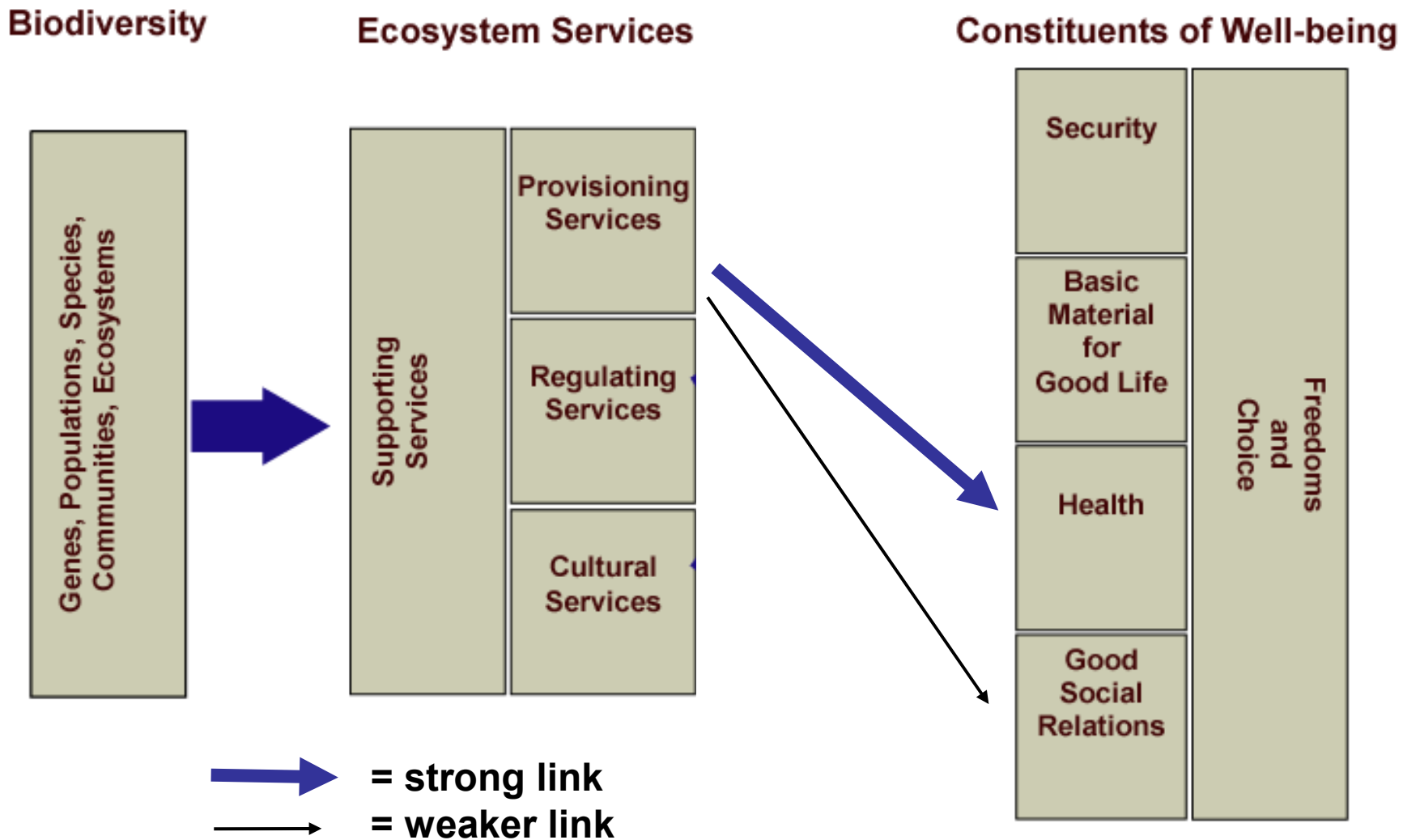
Ecosystem Services



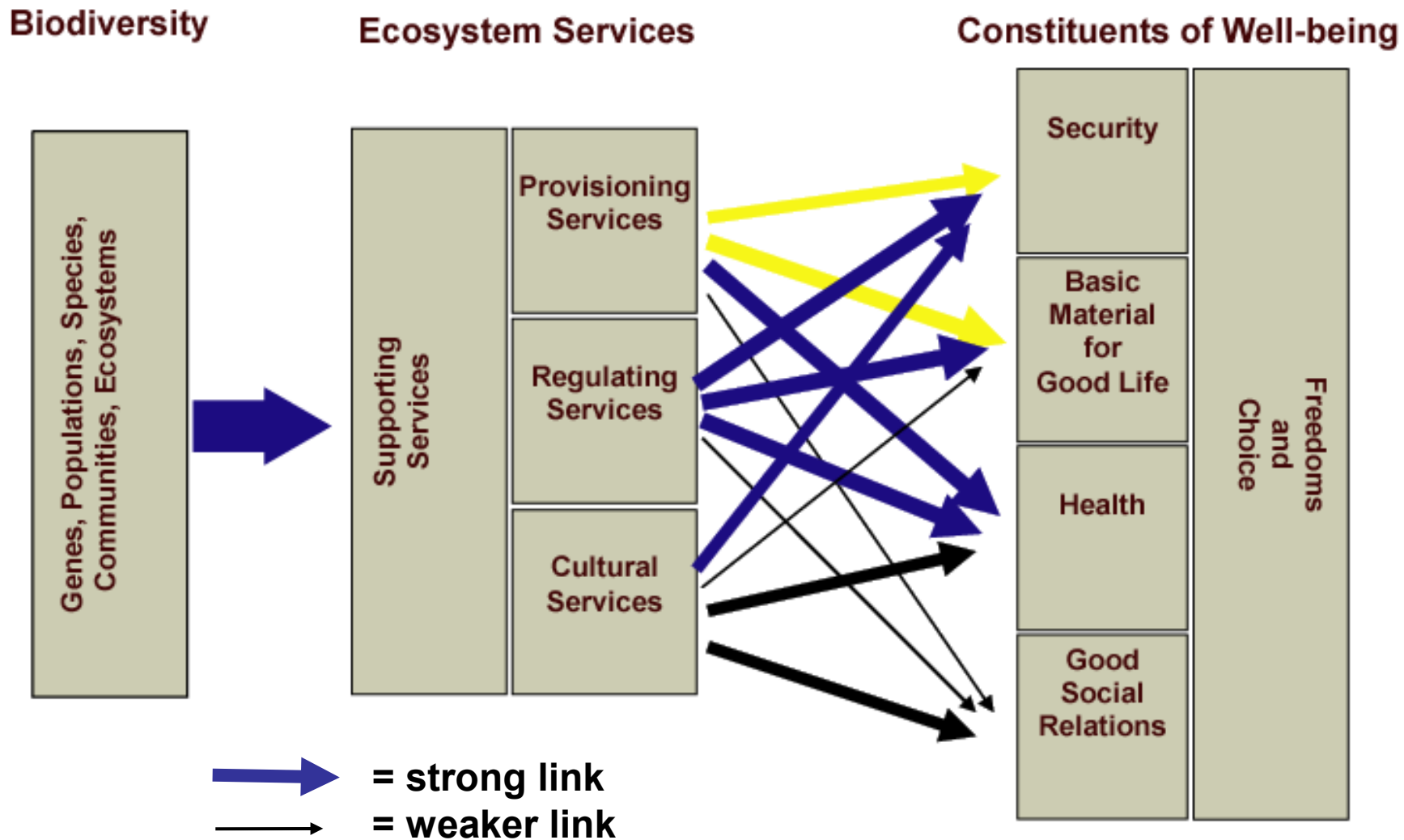
Constituents of Well-being



Links between biodiversity, ecosystem services and human well-being



Links between biodiversity, ecosystem services and human well-being



Main findings

- **We have made huge changes to ecosystems to meet our growing needs and demands**
- **The scale of this change has been rapid and it is accelerating**
- **Brought many benefits, but at a high cost, both to ecosystems and human wellbeing**

What actions can be taken?

- **Strengthen measures designed with the primary goal of both conserving biodiversity and sustainably using ecosystem services**
- **Short terms targets are useful, but long term targets are needed to guide policies and actions**
- **Improved capability to predict the consequences of changes and ways to measure biodiversity**

Global Assessment follow up



- **Endorsed at a partners meeting in October 2007**
- **Coordinated efforts to maximise the impact and build on what has gone before**
- **Focusing on four main areas:**
 1. **Increasing our knowledge**
 2. **Implementing policies**
 3. **Communication and capacity building**
 4. **Future ecosystem services assessment**

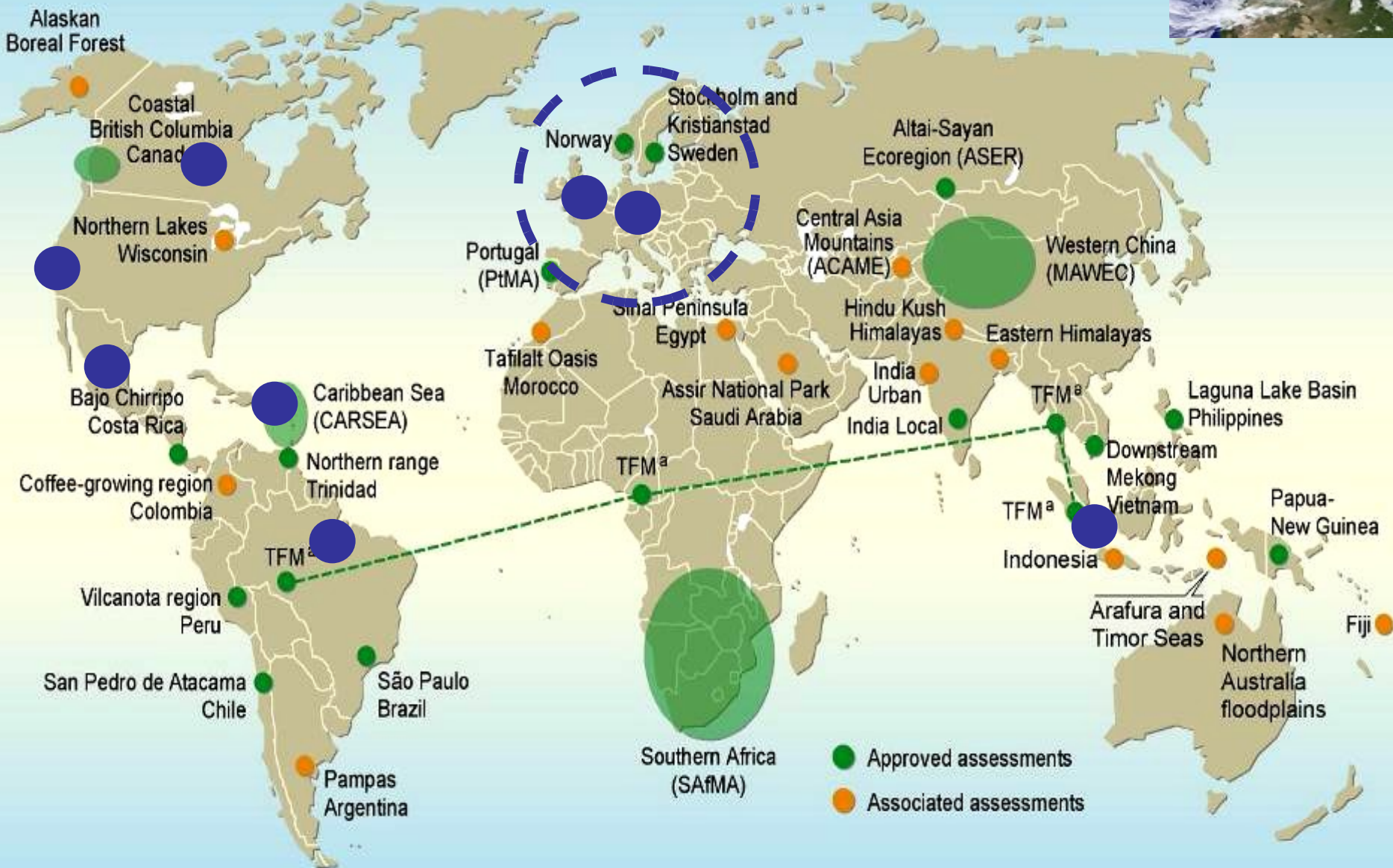
Sub-global Assessment follow up



- **33 countries included in the original assessment, many still underway**
- **Local, basin, national and regional scales**
- **Number of new sub-global assessments are underway**



Sub-global assessment follow up



^a Tropical Forest Margins

Sub-global Assessment follow up



- **Secretariat established in co-operation with UNEP, the Cropper Foundation and UNEP-WCMC**

- **Aims to**
 1. **Promote the exchange of information and lessons learnt between assessments**
 2. **Bring together information gathered to lay the groundwork for and strengthen a future global ecosystem assessment**

Sub-global Assessment follow up



- **Series of on-going activities**
 - **1st meeting of researchers carrying out assessments (10-13 April 2008, Malaysia)**
 - **Methods manual to guide the implementation of assessments**
 - **Develop policies and guidelines for assessments**
 - **Re-establish and establish new contacts with focal points**

Sub-global Assessment follow up



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- **Pilot workshops in South Africa and Mexico to discuss ways to make information available to policy and decision makers**

Conclusions

- **Biodiversity plays a key role both in the provision of ecosystem services and human wellbeing**

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Conclusions

- **Biodiversity plays a key role both in the provision of ecosystem services and human wellbeing**
- **Global and sub-global assessments allow us to look at links between these at a range of scales**
- **How can the framework and findings of the Millennium Assessment be used to strengthen decision making?**

Biodiversity, ecosystems and people

The Millennium Assessment aimed to:

- Assess the consequences of ecosystem change for human wellbeing

- Establish the scientific basis for actions that enhance both:
 - 1) the conservation and sustainable use of ecosystems
 - 2) how both of these contribute to human wellbeing

