Geo Factsheet

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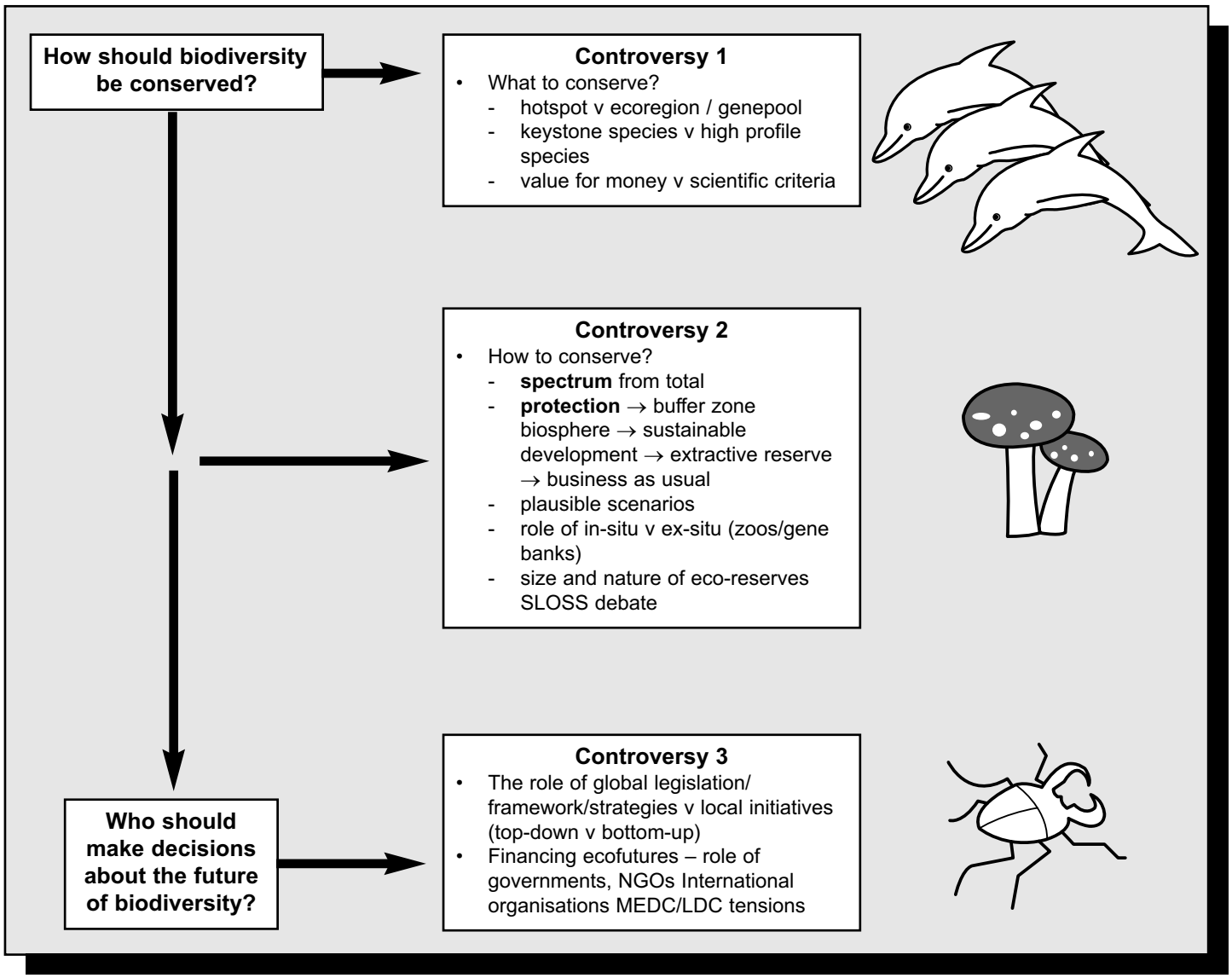
Millennium Ecosystem Assessment 2
CONSERVATION OF BIODIVERSITY

The 2001 Millennium ecosystem assessment (MA) considered the following questions.

1. What are the current conditions and trends in the state of ecosystems, ecosystem services and their ability to affect human well-being?
2. What are the critical factors **(drivers)** causing any changes?
3. What options exist to enhance the conservation of ecosystems for the future and therefore enhance/improve human well-being?
4. How might ecosystems and their services change in the future under various management scenarios?
5. What are the key uncertainties that hinder effective decision-making concerning ecosystems?
6. What tools and methodologies used in the MA can be used for future assessment?

This *Factsheet* follows on from *Geo Factsheet 208* and considers in particular Questions 3, 4 and 5.

Fig. 1 Conservation controversies.



Conservation Options

A number of issues exist when considering how best to conserve biodiversity. Biodiversity loss like climate change is a **global** issue and requires global framework for action **combined** with the effective operation of national, regional and local strategies.

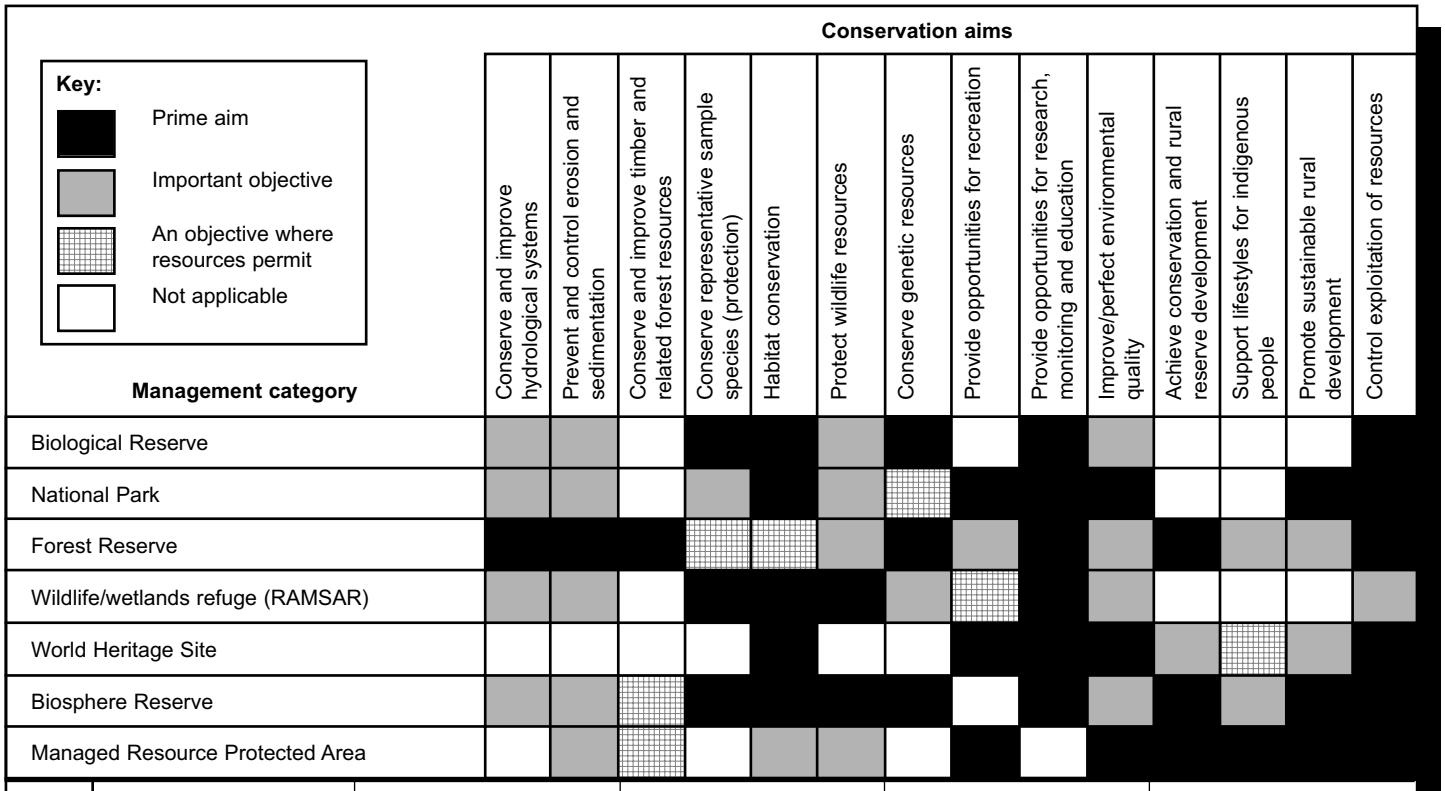
Initially before the 1990s biodiversity loss was seen as a scientific global issue with a whole series of frameworks for species protection and habitat conservation (e.g. 1971 RAMSAR wetlands convention).

Global frameworks were also developed to conserve areas of outstanding ecological importance. UN agencies such as UNESCO (responsible for the Biosphere Reserve programme), and UNEP responsible for GEMS (Global, Environmental Monitoring System) combined with private organisations such as IUCN who are responsible for the designation and categorisation of protected areas such as World Heritage Site, and WWF an NGO which specialised in wildlife conservation. *Fig. 2* shows the variety of categories of protected areas, and their many and frequently conflicting objectives. In the 1990s it became apparent that biodiversity loss was accelerating in spite of numerous global initiatives and resulting national strategies, largely because **protection only** strategies would not sufficiently conserve biodiversity long term.

Five reasons were identified for this failure:

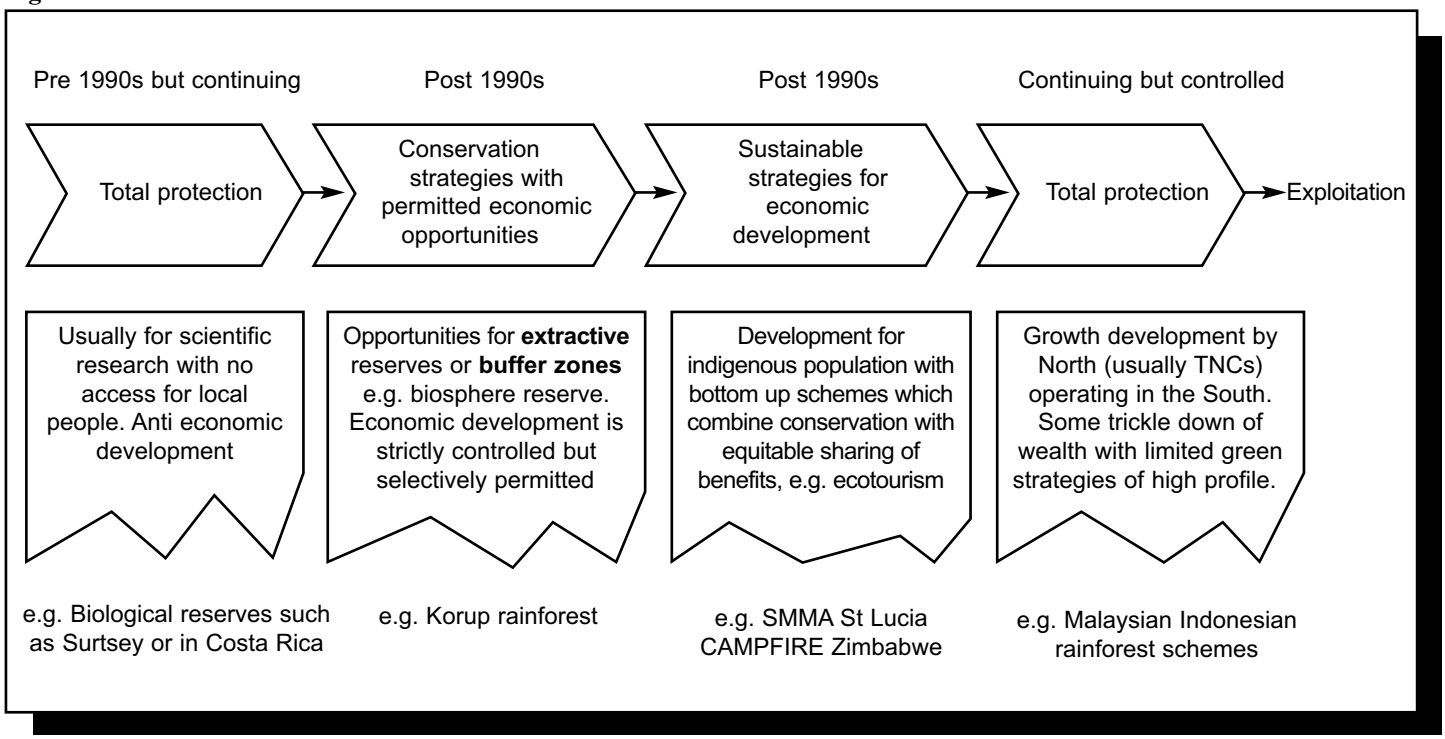
- Global strategies and frameworks are often useless when the actual occurrence of the problem is highly **localised** with many diverse causes.
- Global strategies need linking to regional, national and local systems to ensure a unity of purpose and use of budget.
- The conflict between the need for survival and economic development and conservation, in many of the poorest countries of the World had not been fully understood. In particular, a growing population (3%+ per year) cannot feed itself if the hunting and trapping of wild animals, and the gathering of fuelwood are banned (known as the **hot dinner syndrome**).
- The policies developed were narrowly based, emphasising protection, failing to see the success of conservation is heavily influenced by socio-economic, cultural and political factors.
- Many of the quite numerous protected sites were often only protected sites on **paper**. They were often too small and always country-based. Together, they only covered 6% of the earth's surface and were very unevenly distributed by continent.

Fig. 2 Various conservation objectives of different protected areas.



Era	Perception of nature	Relationship with local people	Solutions and technologies	Power relations	Key influences
1960s	Remote wilderness	Local people seen as a threat	Exclusion and protected areas	Alliances with national and government agencies	Colonial conservation; elitist interests
1980s	Ecosystems, biodiversity and eco-regions	People can't be ignored; people to be more of a resource	Buffer zones; a move towards more sustainable-based community conservation	Welfare and biodiversity for people	Sustainable development debate; growing concern for livelihoods
1990s	'Culture in nature'	Align with local people - symbiosis	Alternative protected areas; participatory natural resource management; human rights	Many more alliances at grass roots and bottom-up	Human rights movement and participatory development

Fig. 3



Therefore, in 1990 at the Rio Earth Summit, the **Biodiversity Treaty** was passed which aimed to conserve biodiversity via 'the **sustainable** use of its components' and the **fair and equitable sharing** of its benefits. The issue is to achieve a balance between growth/ consumption and protection/conservation, with sustainable development, seen as the middle way in the **conservation spectrum** shown in *Fig. 3*. Conservation strategies are now **holistic** involving local economic development as a conservation tool, using bottom-up strategies of governance.

With only a certain amount of funding for conservation, there are clearly controversies as to what to fund in terms of locations and species. On the one hand, it would seem logical to save the best bits (most diverse and rarest), or those under greatest threat i.e. the **hotspots** (areas containing at least 0.5% or 1500 of the world's recorded plant species). Most hotspots are in tropical areas, and cover only 1.4% of the Earth's surface. Equally, it might seem sensible to save the World's most attractive and photogenic animals (e.g. pandas, whales, leopards) as this can lead to provision of extra funds, when actually key stone species such as fungi would be far more beneficial to the ecosystems as a whole. As hotspots are very unequally spread across the range of global ecosystems, many organisations such as WWF now advocate an **eco-regions** strategy whereby funds are spent on conserving representative habitats around the world (Global 200 Eco-regions).

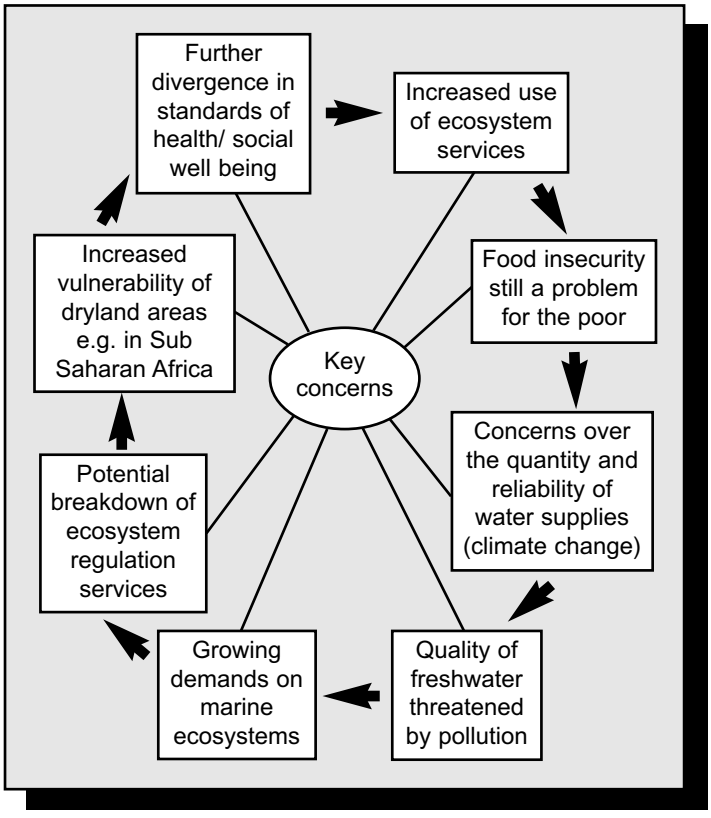
Value for money is another concept – clearly, in terms of costs, LDCs have much lower conservation costs, so 'you get a bigger result for your money'. Unfortunately, schemes in LDCs are harder to develop and manage, and as much of the funding comes from MEDCs, many donors prefer to support local schemes.

The **design** of reserves is also crucial, with the pressures of climate change favouring **larger reserves** or using wildlife corridors to link **several smaller reserves**. This debate is known as the SLOSS debate (single large or several small) with the former now favoured.

The MA and the future of the World's Ecosystems

The MA takes thinking on conservation into the new Millennium. Whilst recognising that past actions such as the creation of over 100,000 protected areas currently covering 12% of the world's land surface, have done much to slow or even reverse biodiversity loss, these improvements have failed to keep pace with growing pressures and demands. *Fig. 4* identifies the key concerns.

Fig. 4 Key concerns of the MA.

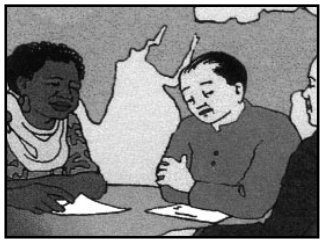


The MA then went on to develop a number of scenarios *(see Fig. 5)* which attempt to model variables such as population growth and choice of economic strategies to assess their likely impacts on the states of the world's ecosystems and the consequences for human well-being.

Fig. 5 Four scenarios.

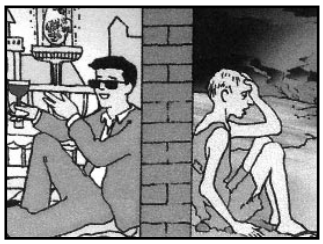
Global orchestration

- A globally connected society focuses on global trade (free trade) and economic liberalisation.
- Reactive approach to ecosystem problems.
- Takes strong steps to reduce poverty/inequality.
- Investment in public goods such as infrastructure and education.
- Highest economic growth and lowest population growth of all scenarios



Order from strength

- Regionalised and fragmented world concerned with security and protection.
- Emphasises primarily regional markets (e.g. EU).
- Pays little attention to public goods.
- Reactive approach to ecosystem problems.
- Lowest economic growth rates (especially LDCs) while population growth highest of all scenarios.



Adapting mosaic

- Regional watershed scale ecosystems, e.g. Mekong, are the focus of political/economic activity.
- Local institutions are strengthened leading to local ecosystem management strategies.
- Socially develops strongly proactive approach to ecosystem management.
- Economic growth gradually increases – population growth second highest especially in LDCs.

Techno garden

- Globally connected world relying strongly on environmentally sound technology (green).
- Highly managed, highly engineered ecosystems deliver efficient services.
- Proactive approach to ecosystem management to avoid problems e.g. in agriculture.
- Economic growth is high as innovation spreads to LDCs.
- Population growth mid range.

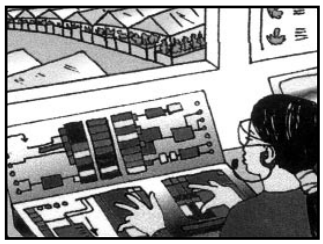
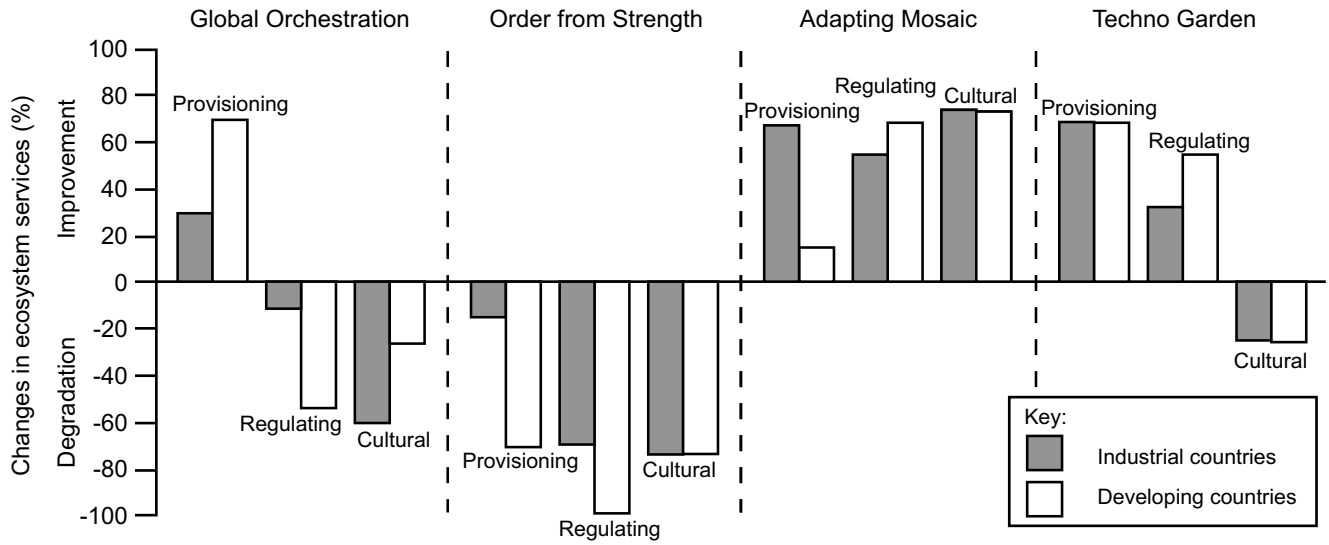


Fig. 6 Ecosystem services enhanced or degraded in the four MA - projected results for 2050.



Note *in 3 out of 4 scenarios at least one of the three categories of services is in better condition in 2050 than in 2000 as a result of positive interventions such as investing in environmentally sound (green) technology or using proactive strategies to address environmental problems or investing in pro poor strategies to improve education and reduce disparities and poverty.*

In conclusion *Table 1* identifies some of the barriers to progress in biodiversity conservation and possible solutions. Progress is frequently incremental and is rarely spectacular.

Table 1 Biodiversity conservation.- barriers to progress and possible solutions.

Barriers	Solutions (examples)
• Inappropriate instructional/ government arrangements including corruption and weak systems of regulation. • Market failures and misalignment of economic incentives such as subsidies. • Social and behavioural factors, including lack of political and economic power of groups such as the poor, women and indigenous peoples who are dependent on ecosystems, e.g. for subsistence. • Under-investment in the development and diffusion of technologies that could increase efficiency of use of ecosystem services and reduce impact of drivers of change. • Insufficient knowledge (as well as poor use of existing knowledge) of ecosystems services and their management. • Poor design of decision making processes.	• Ensure management frameworks, e.g. from World Bank, include due regard to the importance of ecosystems. • Increase stakeholder participation in decision making by devolving power to regional/local levels, e.g. Mekong River Commission. • In general promoting integrated management across agriculture/forests/ energy. • Eliminate subsidies promoting excess we use of ecosystem services e.g. move over from production to environment subsides. Creation of markets such as carbon trading. • Mechanisms to promote consumer preference, e.g. sustainable forest and fish certification. • Using education and public awareness programmes to reduce consumption of key ecosystem services. • Empowering key groups such as women farmers and young people to take control of sustainable schemes. • Promotion of technologies which increase crop yields without any harmful impacts, e.g. pesticides or nutrients, i.e. GM not green revolution. • Restoration of ecosystem services (e.g. reafforestation) or pollution filtration in wetlands. • Promoting energy efficient technology to reduce greenhouse gas emissions. • Ensure both market and non-market value of ecosystem costs are included in resource management/investment decisions. • Use place-based indigenous knowledge as well as formal scientific knowledge to inform decisions. • Enhance and invest in human capacities for ecosystem management, e.g. of aqua culture. • Use active adaptive management strategies, e.g. when setting fish harvest levels. • Ensure decisions favour long-term strategies for managing regulating, cultural and supporting ecosystem services. • Develop multi-scale co-ordination. • Develop frameworks and methods to make better decisions in the face of uncertainties in particularly taking account of vulnerability and equity.

Further Reading and Research

- *Ecosystems and Human Well Being* – Synthesis of MA Island Press ISBN 1-59726-040-1
- *Living Planet Atlas* – published annually by WWF
- *Atlas of Endangered Species, Earth Scan*

Useful Websites

- www.wri.org World Resource Institute
- www.unep.org United Nations Environmental Programme
- www.mea.org Millennium Ecosystems Assessment
- www.wwf.org.uk or www.panda.org WWF sites

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