

Human health, ecosystem services and biodiversity

Facts

Biological diversity (biodiversity) is the variation of life in all its forms: from genes to species to ecosystems to landscapes.

An ecosystem is a functional unit of interaction between animals, plants and the physical environment, e.g. a lake or forest.

Ecosystem services are all the fundamental benefits that an ecosystem provides which are essential for our survival e.g. food production, bioenergy, water purification, climate regulation, soil production, erosion control and mitigation of the effects of natural catastrophes. The United Nations global study, the Millennium Ecosystem Assessment which was completed 2005, showed that 60% of the 24 studied ecosystems were in the process of being depleted.

Resilience is the ability of a system (social and/or ecological) to cope over the long-term with substantial stressors such as climate change. There is a strong correlation between biodiversity and ecosystem resilience, and its ability to deliver ecosystem services.



Sustaining ecosystem services are crucial to human health. Biodiversity is necessary to reach the three health-related United Nations Millennium Development Goals. A rich and varied biodiversity, both wild and cultivated, strongly contributes to reducing malnutrition amongst poor people who often do not consume a varied diet. More than 50 percent of all commercial medicines used today come from natural substances, mainly coming from the rainforests.

Ecosystem services

- Today poor people are increasingly affected by natural catastrophes. The impact of drought, flooding, tidal waves and insect epidemics are more severe when biodiversity is depleted, and an ecosystem's ability to buffer natural catastrophes decreases.
- Deforestation and ecosystem degradation are contributing to the rise of dengue fever, malaria, rabies and yellow fever in developing countries in subtropical and tropical regions.
- Clean water is the basis for good health. Intact forests and undisturbed wetlands in watersheds strongly contribute to purification and ample supply of water. For instance, the Nakivubo wetland area in Uganda functions as a natural sewage treatment system.
- A general intensification in chemical usage and a growing population without sanitation infrastructure is leading to an increased burden on ecosystems, which in turn leads to increased polluting of water bodies, spread of disease and genetic damage to humans.

Medicines

- WHO estimates up to 80% of the population in developing countries, especially those who are poor, are dependent on traditional medicines from nature.
- Traditional medicines are also cultivated in local home gardens and in traditional cultivating systems. In pace with the disappearance of these systems, so also the local knowledge concerning traditional medicines is disappearing.
- The global market value of medicinal plants exceeds 60 billion USD annually.
- Protection of forest ecosystem diversity is crucial for the continued collection of medicinal plants. Half of the ca 20 000 medicinal plants used today are threatened with extinction.



Nutrition and human health

- Forest products, such as honey, wild fruits and herbs, firewood and charcoal, medicines etc. provide incomes and food which contribute to a more varied, nutritional intake. In for example, Laos and Tanzania, forest products stand for up to eighty percent household income.
- A diverse agriculture, with several different crops and varieties, lowers the risk that an entire harvest is lost, for instance during drought or pest invasions. It can also contribute to increased flexibility in labour input in the field and a more nutritious diet which improves health of, for example, AIDS-infected people and their families.
- Fish, snails, molluscs, and other aquatic animals are an essential source of protein, fats and minerals for more than a billion people in Asia. The current overfishing in coastal marine waters is substantially reducing poor people's access to fish as a source of nutrition. The increasing amounts of pesticides, herbicides and artificial fertilisers used in agriculture, are causing an increased accumulation of poisons, especially in aquatic organisms, which is causing health problems among local peoples.

Controversial issues:

- 1) **Who benefits from the traditional wisdom?** Knowledge of traditional uses of biodiversity can often be used in development of modern medicines. There have been occurrences of companies or institutions taking patents on genetic resources and related traditional knowledge without the original guardians' awareness or benefit. This is called biopiracy. Access to; and just benefit-sharing of profits from the usage of genetic resources and traditional knowledge of its usage is subject to an extensive international debate taking place in as diverse forums as the World Trade Organisation and the Convention on Biodiversity. An example of this conflict is Indonesia's decision to not send samples of bird flu virus to the World Health Organisation in protest against that they are not granted the possibility to share in the benefit in form of receiving vaccines against reasonable compensation despite the fact that they are one of the worlds most affected countries.
- 2) **Natural medicines** – effective or not? There are still differing opinions concerning the medical value of "natural medicines". These medicines are widely used by poor people in developing countries, yet critics point out that in many cases there is a lack of scientific evidence supporting their effectiveness and in the worst case they may cause serious side effects. An important issue is then: if and how the formal healthcare sector can increase its cooperation with traditional healthcare.
- 3) **Media coverage of bird flu** has spread the idea that migrating birds are an important vector of infection, despite this being misleading. This has led to worrisome calls for culling. Also, the mass slaughter of chickens impacts poorer people harder, as they are especially dependant on poultry as a source of income and protein.

Recommendations: Important aspects to include in dialogue with collaborating partners and within development aid

- Work towards better cooperation between health specialists and natural resource managers within development programs and sector support.
- Integrate rational and planning concerning environmental and natural resource protection and sanitary systems such as sewage, purification plants and garbage disposal.
- Highlight the importance of local and traditional knowledge since indigenous peoples' expertise on medicine and health can improve healthcare. Stimulate cooperation between various stakeholders, such as local people, traditional healers, medical practitioners, pharmaceutical and forestry companies, NGOs and government.
- Emphasize the importance of good nutrition and preventative healthcare by supporting agricultural systems with many different crops and varieties which provides poor people with more nutritional food. Healthcare advisors should be educated about local food production so that the status of wild plants and locally adapted crops can be improved.
- Work towards sustainable development by emphasizing the importance of conserving rare and threatened species of plants and animals which may be used to produce medicines for future generations.

Suggested further reading and references:

- Human Health and Forests. A Global Overview of Issues, Practice and Policy. Colfer, C. J. (ed.) (2008)
- Millennium Ecosystem Assessment synthesis report on Biodiversity and human health (2006)

SwedBio

SwedBio is a program at the Swedish Biodiversity Centre (CBM) initiated 2003 by Sida with the purpose to promote a proactive approach to biodiversity within the frame of Swedish development aid. SwedBio strives for the advancement of a fair, sustainable and productive use of; as well as sound management of biodiversity, as a base for poverty reduction. SwedBio supports initiatives in developing countries that contribute to method and policy development concerning biodiversity and poverty reduction. SwedBio also provides expert advise to Sida, for instance during assessments and follow-up of programs in various sectors.

Web site: www.swedbio.org
E-mail: swedbio@cbm.slu.se
Telephone: + (46) 18 672263