

Unit 4 Lecture 3

Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values

Consumptive use:

Biodiversity, as defined by the Convention on Biological Diversity, “means the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems”. In its simplest form, biodiversity includes all species on the planet, from single cellular organisms (bacteria and viruses) to complex organisms such as plants and animals. At the cellular level, biodiversity refers to genetic variations between populations of species separated by geography, as well as those among individuals within single populations. On higher levels of organisation, biodiversity also includes “variations in the biological communities in which species live, the ecosystems in which communities exist, and the interactions among these levels. All levels of biological diversity are necessary for the continued survival of species and natural communities, and all are important for the well-being of humans.”

The value of biodiversity can be separated into two categories: anthropocentric and intrinsic or ethical. Anthropocentric value is comprised of direct and indirect economic benefit to humans and ethical value is based on a respect for life, a reverence for the living world and a sense of intrinsic value in nature and a concept of divine creation.

Biodiversity provides a range of goods, from agricultural crops to medicines and fibres, to which a direct value and cost can be assigned. This direct economic value of the natural environment can be divided into those associated with consumption and production i.e. consumptive use and productive use values.

Consumptive use value is usually assigned to goods consumed locally that are neither bought nor sold and therefore do not contribute to the economy of a country. People “living off the land” obtain the goods that they need for survival from the environment. Should the environmental quality decline, for whatever reason, their standard of living would obviously deteriorate.

This consumptive use value can also be seen in the use of fuelwood for heating and cooking. It is estimated that about 2.4 billion people use fuelwood and other forms of biomass for cooking and heating.

Productive Use:

Productive use values are assigned to those goods harvested from the environment, which are bought and sold locally, nationally or internationally. Major products include construction timber, fuelwood, fish and shellfish, fruits and vegetables and seaweed, to

name a few. In some cases, wild populations of species act as the blue print for the synthesis of medicine. As in the case of aspirin, one of the most valuable and widely used medicines, once the chemical structure had been identified from nature, it was found to be cheaper to synthesise than to grow. Other examples of medicines whose chemical structures were derived from nature are morphine, modified from the poppy plant (opium), and novocaine, a synthetic form of cocaine derived from the coca plant. The 20 pharmaceuticals most used in the United States are all based on chemicals first identified in natural products; these drugs have a combined sales value of \$6 billion per year. One such example of this is the rose periwinkle from which drugs have increased the survival rate of childhood leukaemia from 10% to 90%. Peruvian Indians treated malaria with an extract from the bark of the *Cinchona* tree. Study of this extract led to discovery and use of quinine, the first effective treatment for malaria.

Social value:

Biodiversity has social amenity value. It can improve standards of living, make people proud, and help them lead more fulfilled lives. In a way of thinking closely related to the economic arguments outlined above, biodiversity is said to have value as a resource for sustainable development, "The conservation of biodiversity is the management of human interactions with the variety of life forms and ecosystems so as to maximize the benefits they provide today and maintain their potential to meet future generations' needs and aspirations." Until a clear majority of us live lives of dignity, with the reasonable expectation that our needs and those of our children can be met through our own individual efforts, the world will continue to be a hostile and unstable place, and the biodiversity on which an enhanced quality of life for us all might be based will continue to disappear rapidly. People everywhere would clearly become more interested in preserving biodiversity if they were convinced that it is an essential resource for sustainable development.

Option Value:

This is the value of biodiversity in providing benefits for communities in the future. Biodiversity has uses and values, which may not yet be known or can not be utilized by humans at present. With the change in demands and consumption pattern as well as technological advances, this value will be important in future. The potential of wild plants as medicinal sources is an example of the option value. Many pharmaceutical companies and government health agencies are intensively trying to discover new medical materials from biodiversity in it's natural habitat in order to treat disease such as AIDS and cancer.