

Impact of pollution on the flora and fauna – a loss of ecosystem services

Goldin Quadros

Salim Ali Centre for Ornithology and Natural History (SACON) Aaikatty Post, Coimbatore 641108. Tamil Nadu. India.

Email: goldinq@gmail.com

Biodiversity has multiple values owing to the different ecosystem services it provides. The types of values include economic, social and environmental, many of which are poorly recognized and/or understood. Species provide a variety of functions and help maintain relatively stable ecosystems. Our understanding of the functioning of biodiversity within ecosystems needs to be improved. The information on the status and trends of biodiversity allows for patterns to be identified as well as to determine the consequences of biodiversity loss.

The increasing demand for food, fiber and fuel will lead to increasing losses of biodiversity and ecosystem services. The variety and variability of animals, plants and microorganisms are an important aspect of biodiversity. Globally most of the natural habitats including forests, wetlands and coral reefs are in a state of decline. The habitat loss, including degradation and fragmentation, is the most important cause of biodiversity loss globally. Some agricultural, aquaculture and forestry practices are also a major cause of biodiversity loss. Habitats, which are highly degraded or fragmented, are less likely to be able to support their full compliment of species or provide the same level of ecosystem services provided by intact habitats.

Pollution is a major concern of all countries and a known threat to biodiversity. Pollution refers to chemical contaminants that are introduced to the environment resulting in instability or harm. Pollution can take numerous forms as a variety of chemical compounds can cause environmental damage depending on their properties and concentrations. Nutrient loading in particular, primarily of nitrogen and phosphorus is a major and increasing cause of biodiversity loss and ecosystem dysfunction, especially in wetland, coastal and dryland areas. As nitrogen and phosphorus are often limiting nutrients in many ecosystems when they are present in excessive quantities they can result in rapid plant growth which can alter ecosystem composition and function. Common causes of excessive nutrients are sewage and agricultural runoff.

Pollution by invasive alien species (IAS) is also one of the main direct drivers of biodiversity loss at the global level. In some ecosystems such as island ecosystems the IAS are the leading cause of biodiversity decline. Any organism can become invasive; the phenomenon is not limited by taxonomic group and can occur in all types of ecosystems. The IAS primarily affect biodiversity by preying on native species or competing with them for resources. Increasing travel, trade and tourism have facilitated the movement of species beyond natural biogeographical barriers by creating new pathways for their introduction. While a small percentage of introduced species become invasive, the negative impacts can be extensive. In addition to their environmental impacts, IAS can pose a threat to food security, human health and economic development.

All ecosystems provide goods and services. However, some ecosystems are particularly important for human well being because of the services they provide and fulfill their daily needs. The unsustainable use or over exploitation of these resources is one of the main threats to biodiversity. Overexploitation is a severe pressure on the ecosystems that leads to the loss of biodiversity and ecosystem structure. In addition, the unintentional impacts would result in loss of species and damage to habitats. Pressures on species and ecosystems must be kept at levels that do not undermine the long term sustainability of the ecosystems thereby allowing them to provide ecosystem services. Sustainable management not only contributes to biodiversity conservation but can also deliver benefits to production systems in terms of services such as soil fertility, erosion control, enhanced pollination and reduced pest outbreaks as well as contributing to the well-being and sustainable livelihoods of local communities engaged in the management of local resources.