Agroforestry supports ecosystem services and biodiversity conservation

Trees protect waterways from erosion and lessen the impact of floods and droughts. Trees help water soak into the soil around them. This prevents runoff, soil erosion and flood damage, leading to better aquatic habitats and water quality.

Tree roots also filter contaminants and pollutants and their leaves trap windblown dust, keeping them out of waterways. Trees can be planted on sloping land to halt landslides and protect waterways from silt.

Investing in landscape stewardship for watershed protection

Farmers in the upper reaches of many Asian watersheds stand to benefit from new schemes in which they receive cash or in-kind payment for land-use practices that deliver clean water to downstream uses such as hydropower generation. Under the World Agroforestry Centre’s RUPES project (Rewarding Upland Poor for Environmental Services), pilot projects have been testing approaches for investing in landscape stewardship by local communities for maintaining forests or practising agroforestry that ensures healthy ecosystems and clean water.

Rewards for environmental services in Tanzania

In the Usambara Mountains of Tanzania, deforestation and unsustainable land uses pose a threat to clean waterways and other environmental services. Through the PRESA (Pro Poor Rewards for Environmental Services in Africa) project, World Agroforestry Centre researchers are exploring ways of addressing this degradation by offering rewards to upland farming communities for combating land degradation with sustainable farming practices, including agroforestry.

Conserving biodiversity

Agroforestry increases the variety of species – biodiversity – on farms and around them. Trees add to the diversity and complexity of plant communities and provide habitats where other plants and animals can live and breed. Trees on farms create shelter and corridors for wildlife to move from one reserve to another. They also act as buffers for nature reserves and other protected areas. Trees attract insects and birds that pollinate crops and destroy pests. Planting indigenous trees that are adapted to local conditions allows birds, insects and small mammals to nest, feed and shelter from predators.
Trees enrich and protect diversity

The Agroforestry Resource Centre in Riba, in the mountainous northwest of Cameroon, is close to Kilum-Ijim Mountain Forest. George Kangong, founder and coordinator, has seen more and more birds returning to Riba over the last 10 years. He says it’s because households have started planting indigenous fruit trees.

Similarly, in the hill country around Bamenda, the capital of the northwest region, a decade ago there were hardly any African plums. Now they are everywhere, enriching biodiversity on thousands of smallholdings. Kuh Emmanuel, coordinator of another resource centre, believes that farmers who have improved their incomes are much less likely to exploit the forests.

Building tree diversity on farms

On-farm domestication of valuable trees is helping to conserve important genetic resources and earn extra income for farmers in the Peruvian Amazon. Population pressures and small farm sizes in this region mean that the fallows in traditional slash-and-burn agriculture have become so short that valuable tree species and soil fertility are no longer able to regenerate naturally. This leads to degraded local biodiversity, reduced annual crop yields and increasing poverty. By selecting and domesticating these valuable forest species, farmers are relying less on annual cropping and more on sustainable agroforestry systems thus creating new income opportunities while protecting biodiversity.

Agroforestry for protecting biodiversity

Habitat destruction by humans has dramatically increased rates of biodiversity loss. Worldwide, protected areas only amount to about 6 per cent of the total land area, yet deforestation to create more agricultural land continues to destroy biodiversity. Agroforestry is an agricultural practice that can both provide food crops and play a big role in protecting biodiversity, because it provides an alternative to forest exploitation.

Protecting wildlife in Asia

In Sumatra, old rubber agroforests act as buffer zones and corridors for the endangered orang-utan, helping to keep humans and orang-utan apart yet providing for the needs of both. The agroforests are also home to numerous species of bat, whose job is to pollinate crops and other plants. In Nepal, the Worldwide Fund for Nature and the King Mahendra Trust for Nature Conservation created a rosewood agroforest around the Royal Chitwan National Park, a valuable conservation area for native forest and wildlife, including the endangered tiger. The agroforest reduced pressure on the national park, helping to conserve biodiversity.

For more information visit www.worldagroforestry.org, and search keyword ‘ecosystem services or biodiversity’.