

The knowledge of natural biodiversity saves us billions

We are quite a penchant for tangible benefits that can be measured in terms of monetary value. Many a time intangible benefits derived from our environment are so obvious and well-impregnated into our daily lives that we tend to forget their overriding importance. The role of biodiversity often goes unnoticed in a similar vein, but the knowledge can be instrumental in designing ecologically and economically sustainable strategies. One such example is employing biological control of the pests of crops. Through biological control, scientists have greatly lessened the risk faced by many of the farmers living on the edge and spurred rural growth in marginal environments across the world. To implement such a program, these scientists have to be meticulous to inventory, test, select, and release natural enemies of insect pests that used to wreak a havoc. A deeper understanding of the natural history of the beneficial co-evolved insects is of utmost essential so to keep it ecologically viable.

A classic example of biological control of pests can be sought from the case of coconut scale or transparent scale (*Aspidiotus destructor*). It threatened the crops like coconut, bananas, and also avocado, breadfruit, cassava, guava, oil palm, sugarcane in the early Twentieth Century with a huge economic loss. Then in 1920, the control of the outbreak began, beetles from Trinidad and parasitic wasps from Java were introduced and positive results were immediately discernible. Of all, the ladybird beetle, *Cryptognatha nodiceps* (and later *Cryptognatha gemellata*) were the most efficient in bringing the scale rapidly under control. Consequently, coconut scale ceased to be an issue and a huge economic loss and crisis have been averted thereby.



Biological control: The wasp *Aleiodes indiscretus* parasitizing a caterpillar of gypsy moth - a serious pest of forestry

There are many other examples to fit into these classic cases of biological control. And, the benefits accrued from the process can be enormous, at the tune of billions, so says a freshly baked by study (Wyckhuys et al. 2020. <https://doi.org/10.1038/s41559-020-01294-y>) by an international group of researchers. They employed cutting-edge analyses to estimate the economic benefits ushered by nature-based contributions to productivity in over a century (1918–2018) and across 23 different Asia-Pacific geopolitical entities. They found that biological control resolved invasive pest threats in multiple non-rice food crops saving farmers in

Asia a phenomenal amount (around US\$14.6-19.5 billion) per year. They add further that scientifically informed biological control of 43 exotic invertebrate pests allowed 73–100% yield-loss recovery in food, feed, and fiber crops such as banana, bread-fruit, cassava, and coconut. The study hinging on agroecological innovations opened avenues for the ways to mitigate invasive pests, instill ecological resilience, and thereby sustainably intensify the production of global agri-food. These innovative approaches armed with a better scientific approach would help feed the world, conserve and use on-farm biodiversity, and improve farmers' quality of life.

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