

Biodiversity and Food Security: Are we really understanding the threat?



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Context of environmental damage and how in history it has contributed to the collapse of societies

- The five-point framework of Jared Diamond
 - ☀ People inadvertently inflict damage on the environment - the extent of the damage and reversibility depend upon the properties of people and the properties of the environment.
 - 💡 Environmental properties - fragile (susceptible to damage) or resilient (potential to recover from damage)

- The five-point framework of Jared Diamond

- ✿ Climate change - a term in the modern context is associated with global warming. But in the history of mankind, it could simply mean climatic aberrations or natural phenomena (volcanic eruptions that causes cooling) or prolonged drought.
- ✿ Hostile neighbors - usually associated by military defeats, but analysis will show that environmental damage was contributory to the weakening of the societies.
- ✿ Decreasing support by close allies - the opposite of the third.
- ✿ How societies responded: People's political, legal, economic, social institutions and cultural values.

The variability of biological diversity

- ✿ The Millennium Ecosystem Assessment points out the variability of biological diversity
 - 💡 More than species richness - abundance, variation, distribution.
 - ☑ Gene level - adaptive variability for production and resilience
 - ☑ Populations - retain local adaptation
 - ☑ Species - ultimate reservoir of adaptive variability
 - ☑ Ecosystems - differing ecosystems delivers diversity of roles

Food Security: what do we understand and why we need to understand it.

- Food security is a flexible and a multi-dimensional concept.
- ✿ Initially defined politically as “availability at all times of adequate world food supplies of basic foodstuff to sustain steady expansion of food consumption and to offset fluctuations in production and prices” (FAO 1974)
- ✿ Food Security exists when all people at all times, have physical, social, and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life.(FAO, 2002)

- Fundamental shift in the outlook: from the supply side to the recognition of entitlements and rights.
- ✿ Uses as basis Amartya Sen’s seminal study in 1981 (Poverty and Famine). Because the contemporary definition highlights entitlements, it is measured at the household level: chronic hunger and poverty.
- ✿ Since food security is an objective, its measure of success deals conversely with the exact opposite of the concept - state of food insecurity.
- ✿ Is this measure sufficient or truly reflective of the state of food security?
- ✿ Onara O’Neill spoke of the need to also identify who will do what, for whom and when.

The alarming facts about biodiversity loss and its link with food security

- From the millions of genes that serve as life's building blocks, to the thousands of plants and animals that inhabit the earth, to the almost limitless combinations of organisms that make up natural ecosystems, **biodiversity makes an essential contribution to feeding the world** (FAO).
- But the pressure to produce food to meet the demand has intensified over the past 100 years. As a result, the natural functions of ecosystems and the variability of genes, species and populations is now severely affected.

- There is now evidence of the narrowing of the biological diversity base for food production if one considers the following:
 - 💡 Over the millennium humans have relied on more than 10,000 different plant species for food - now we have barely 150 species under cultivation.
 - 💡 Of the 150 that is cultivated, only 12 species provide 80% of all our food needs. Only 4 - rice, wheat, maize and potatoes supply 60 percent of our calories and 56 percent of our protein needs derived from plants.
 - 💡 There are also fewer types of farming systems and general cropping patterns due the intertwining effect of wrong policies, shifts in land use, misuse of technology and market failures.

💡 The livestock diversity is likewise significantly under threat. The most recent report of FAO on the State of World's Animal Genetic Resources for Food and Agriculture cited that more than 20% of domestic animal breeds are at risk of extinction or an average of one breed is lost each month.

💡 The same report cited that 62 breeds have been lost over the six years.

💡 The first global assessment of livestock biodiversity indicated that 643 breeds are at risk of extinction. Forty-five (45) of these breeds are in Asia.

💡 FAO also reported that 70% of the world's fish species are either fully exploited or depleted.

The drivers of biodiversity loss: the usual culprits and the emerging influences

- **The usual culprits**

- ☀ Deforestation
- ☀ Habitat destruction
- ☀ Large-scale mining
- ☀ Poverty traps
- ☀ Industrialization and pollution
- ☀ Wrong agricultural policies (ranges from wrong subsidies to question of the concept of the IPR)




The drivers of biodiversity loss: the usual culprits and the emerging influences

- **The emerging influences**
 - ☀ Liberalization and globalization of production
 - ☀ Shifting consumption patterns
 - ☀ Urbanization
 - ☀ The global “rise of the rest”
 - ☀ A different pattern of climate change
 - ☀ The invasion of alien species.

The direct and unaccounted losses of biodiversity to food security


- **The direct losses**
 - ☀ Vulnerability of agro-ecosystems to natural fluxes
 - ☀ Narrowing of agricultural products to limited range
 - ☀ The diminution of genetic pool and variability)not only of plants, but as well as insect, and other organisms.
 - ☀ Threat to food security (food insecurity)
 - ☀ Exacerbate the poverty trap particularly for the most vulnerable sectors of the society.

- **The unaccountable losses**

-  Creating ecosystem imbalances that destabilize the ecosystem functions (the role of pollination, maintenance of soil fertility, water quality and climate regulation).
-  Narrowing options for adaptation, and therefore delimiting the ability of ecosystems to become resilient. Creating an environment of vulnerability for many of the ecosystems.
-  Restricting our abilities to increase our ecological knowledge. The concept of ecological literacy and our understanding to increase the level of certainty for managing risks.

Are the available options for curbing biodiversity loss doable?

- **The challenge is increasing yield while conserving biodiversity ecosystems**

-  The application of sustainable agriculture
 - Use of water, land, nutrients and other natural resources effectively at a rate they are replenished.
 - manage biodiversity in a manner where biodiversity are sustained
 - minimizing the impact of agriculture on wider environment

☀ The menu of options for SA include

- Mixed farming systems
- Organic agriculture
- Integrated pest management
- use of organic fertilizers
- crop rotation
- minimum tillage agriculture
- recycling of crop and animal wastes
- cover cropping

If the options are available, why is there very limited adoption?

- **The international regime is unable to touch the heart of the issues**
- The heart of the issue is in ourselves, looking at our way of consuming resources.
 - Developing and expanding our knowledge base. Not only from the scientific way but including the most practical way of using biodiversity resources.
 - Use of information technology. Democratizing information.
 - Recognize alliances and building a network of alliances
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Understanding the threat is good, but not good enough. If we acknowledge that biodiversity loss has implications to food security: and recognize that everyone entitled to access to food, as Onara O'Neill has said, then let us also start to define who will do what, for whom and when.

Thank you for your kind attention..... and now we are ready for your questions.