

## 17.7: The Sixth Commandment

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The loss of Earth's biological productivity would certainly adversely affect sustainability and, in the worst case, could lead to massive starvation of human populations. A number of human activities have been tending to adversely affect biological productivity, but these effects have been largely masked by remarkable advances in agriculture such as by increased use of fertilizer, development of highly productive hybrid crops, and widespread irrigation. Some of the factors reducing productivity are the following:

- Loss of topsoil through destructive agricultural practices
- Urbanization of land and paving of large amounts of land area
- Desertification in which once productive land is degraded to desert
- Deforestation
- Air pollution that adversely affects plant growth

Biological productivity is far more than a matter of proper soil conditions. In order to preserve and enhance biological productivity, all five environmental spheres must be considered. Obviously, in the geosphere, topsoil must be preserved; once it is lost, the capacity of land to produce biomass is almost impossible to restore. Deforestation must be reversed and reforestation of areas no longer suitable for crop production promoted. (This is happening in parts of New England where rocky, hilly farmland is no longer economical to use for crop production.) In more arid regions where trees grow poorly, prairie lands should be preserved, desertification from overgrazing and other abuse prevented, and marginal crop lands restored to grass.

The hydrosphere may be managed in a way to enhance biological productivity. Measures such as terracing of land to minimize destructive rapid runoff of rainfall and to maximize water infiltration into groundwater aquifers may be taken. Watersheds, areas of land that collect rainwater and which may be areas of high biological productivity should be preserved and enhanced.

It is especially important that the atmosphere be maintained in a condition of climate conducive to high bioproductivity by minimization of global warming.

Management of the biosphere, itself, may enhance biological productivity. This has long been done with highly productive crops. The production of wood and wood pulp on forest lands can be increased—sometimes dramatically—with high-yielding trees, such as some hybrid poplars. Hybrid poplars from the same genus as cottonwoods or aspen trees grow faster than any other tree variety in northern temperate regions, so much so that for some applications they may be harvested annually. They have the additional advantage of spontaneous regrowth from stumps left from harvesting.

Proper management of the anthrosphere is essential to maintaining biological productivity. The practice of paving large areas of productive land should be checked. Factories in the anthrosphere can be used to produce fertilizers for increased biological productivity.

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