

Life Support Mechanism and Ecosystem

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The earth is the only one planet having abundant ecosystems in our solar system.

This means the earth has the life support mechanism helping the existence of those ecosystems. On the other hand, each ecosystem is composed of three types of living organism, so called producer, consumer and decomposer. Various nutritious materials being able to support each other are exchanged and circulated between them through the surrounding environment. But various harmful materials for each other also are released in the surrounding environment. Therefore it will be important problem for future human activities how much capability the material circulation mechanism of surrounding environment including ecosystem has for supporting ecosystem, and how much capability the diluting and decomposing ability of surrounding environment has for decreasing the effect of such harmful materials. Many discussions have been conducted during over 30 years about how to handle the limits of earth as shown in 'Limits to Growth'. But the final settlement for this problem has not yet obtained.

The worldwide and various environmental researches have been done during this period by governmental fund in many countries for finding the settlement, but sufficient results could not obtained because the environmental problems are too much complicated to the present level of scientific knowledge. As for the problem of carbon dioxide, one of the green house effect gas, research of carbon dioxide flux measurements in various places and modeling research for estimating temperature rise due to concentration rise of carbon dioxide have been conducted but there is no precise solution obtained because of the lack of knowledge about the effect of aerosol and cloud on albedo, and of the lack of computational scheme. However these studies showed temperature rise now going on is depending on the human activities. From this fact Kyoto protocol for diminishing the exhaust of green house effect gas has been discussed internationally and main stream for promoting Kyoto protocol has been established. But It is not so easy to diminish concentration of green house effect gas because many objections between developing countries and so on because of economic differences.

The fact that green house effect gas accumulates in the atmosphere of earth means there is green house effect gas exhaust beyond the capability of life support mechanism of the earth by human activities.

It seems necessary to study on that human beings can remain to live sustainably within the capability of earth support mechanism in the situation of increasing population and of leveling up life quality, and if so, what life style will be required for living in such society. The mini-earth in Aomori is the only facility having possibility to conduct such human experiments. The relation of life support mechanism and ecosystem is to be discussed using feature of mini-earth.