

NO.5 The forest, "Where did the forest disappear?"

The Japanese word, "miru", can be interpreted into seven different meanings of seeing, inspecting, looking, observing, diagnosing, appraising and nursing. When giving a glimpse, "miru" is used as seeing. Inspecting and looking is used when staring at something that doesn't change, yet "observing" and "examining" is for something that changes. While like "observing" a plant which watches changes for some period, "examining" is for diagnosis of a certain situation. As its left-hand portion of the Chinese character indicates money, so appraising is often used when measuring the monetary value of things. The first six meanings all have the objective element. In other words, those words do not have feelings, and especially, the word "appraising" can symbolize the materialism in today's society, which judges at the value of money. However, the last word, "nursing" indicates an emotion such as caring. It is highly admirable that our predecessors have carefully considered meanings of "miru" and created characters for each usage. When we think of future earth environment, we need to have an eye of "nursing".

The forest has some important roles.

The 1st role is preservation of the ecosystem. It is impossible to restore the tropical forest once having lost the function of keeping various species. Therefore, it is necessary to work on the preservation of existing tropical forest. For example, 93% (715 kinds) of birds inhabiting in the United States (the country area of land is 83 times of Honduras), 56 kinds of the amphibian which is the same in Japan (the Japanese land is 3 times larger than Honduras), 46 different kinds of freshwater fishes that are 30% greater than in England (which is twice as big as Honduras), and 5000 kinds of phanerogam which is equal to Spain (the country of 4.5 times larger), inhabit in the tropical forest in Honduras in the Central America. It is said that Honduras is regarded as one of the best for the forest management in the Central America, yet 2.3% of the forest disappears every year. The forest is a treasury of biological genetic resources where many materials discovered in the forest are used to produce antibiotics and/or as cultivation plants. Moreover, only about one thousandth of organism including a microorganism is clearly comprehended.

Secondly the forest has a system for absorbing carbon.

The forest plays an important role by absorbing carbon dioxide in the atmosphere and circulating the air of the earth. It absorbs the 5 to 15 tons carbon per ha in the temperate regions (15 to 30 tons in the tropical forest). Therefore, the destruction of the forest will deteriorate the carbon absorbing system and decreases the resource to

create the oxygen. On one hand the human race consumes a great deal of fossil fuel, thus increasing the level of carbon gas in the air, and destroys absorption system on the other. It is giving twice the damage to the carbon filtering system in the earth. An average temperature is expected to increase by 1.4 to 5.8 degree in 2100, thus estimating the sea level to rise by 46 to 70 cm.

The 3rd is a role as energy resources.

Unlike the fossil fuel generated in the geological process, which is impossible to replay, the timber coming from the ecosystem cycle is the energy which can be reproduced. It is possible to take the energy out permanently without causing a climate change by using the energy of this timber efficiently. Of course, burning timber discharges carbonic gas (the same as petroleum of 75 kg per giga-joule, the coal of 120 kg), but this is CO₂ absorbed and stored in the tree, and which eventually returns into the atmosphere. Therefore, the energy generated by burning the timber is the environment friendly recycle energy like the solar, the wind.

The 4th is a utility value as the structure material and so on.

In Japan, timber was used as the construction materials from the ancient times, but in recent years the non-wooden materials such as steel and concrete became into use for the construction of buildings, including housings. However, the timber is superior material from aspect of global warming prevention. For example, the reinforced concrete house of the same floor space generates 3 times as much of carbonic acid gas, and the steel frame concrete excretes 4 times as much as the wooden house. Additionally, when considering the cultural property such as the *Horyu* temple that was built since the old times, the timber is never inferior materials in terms of durability.

The 5th is a role as raw material above.

The paper production in the world has been increased by about 4 times, from 77 million tons (1961) to 300 million tons (1999 estimation) over 40 years. Temporarily, with the information revolution the paper-less society became the trend, but in recent years the production of the paper has been increasing. In fact, since 1960, the trade quantity of the pulp and the paper has been increasing by 5 times or more. The paper product occupies about 45% of the products that are made from the woods in the world, and 90% of the produced paper is discarded once being used. Over 20% of the felling timber in the world is raw materials for paper. It is anticipated that the demand for paper will become increasingly greater in the future.

As mentioned above, the forest has various important roles for the earth environment.

It is critical that the destruction of forest has been occurring at the speed which has never experienced at the earth history.

It is presumed that the forest in the world began to decrease about 10 thousand years ago and has already lost over a half, but the most has been extinct rapidly since the 1700s. Especially since 1940s, it has accelerated the disappearance speed (the crude woods disappear for 16 million ha a year), and about 3 billion ha, approximately a half of 5.8 billion ha of forests which covered the earth in the 1700s, is assumed to have been disappeared in last 300 years. During 15 years from 1980 to 95, at least 200 million ha, the area that is larger than the Indonesian territory and about 5 times greater than Japan, was lost. About 30 million ha disappears yearly since 1995, indicating that approximately 6 billion ha of the forest on the earth will vanish by 2020.

The recent tendency of the forest disappearance shows two regional characteristics. First, a half or more of this disappearance is happening in the rich wildwoods in the developing country (Brazil, Indonesian, Congo, Bolivia, Mexico, Venezuela, and Malaysia). The rest is due to the shrinkage of forests occurring all over the world except for Europe and India. The forest area decreased in 107 countries for 5 years from 1990 to 95. Japan lost approximately 1.5% of country soil (500 thousand ha; twice as big as Tokyo) for 15 years until 1995.

Currently of the remaining forest in the world, only 22% (about 400 million ha) of the outlying area is left untouched, which is large enough to preserve the creature variety. On the other hand, for other purposes such as the use for development, the forest of 18 million ha is vanishing annually.

It will be possible to say that the life of human being in the 21st century depends on whether to develop the attitude for "nursing" the forest. It needs to see with the eyes of nursing the earth environment which included nature, a creature, and human race himself. The human being have promoted "appraising" civilization against nature and human itself, to satisfy own material desire, but will the 21st century be not the time which leaps to the "nursing" civilization?

The various functionalities on the forest can't recover once destroyed. There is not a way except preserving the present situation attentively. A forest is one of the earth environment assets to leave behind to the future generation.

The statistical data

The decrease of the forest (FAO 1993)

The forest decreases by 56.3 million ha for 5 years from 1990 through 95 (1995: FAO), (which disappears by 11.3 million ha per year, about the half of main land).

Tropical woods (1993: FAO) shrank to (1.9104 billion ha) in the end of 1980 and (1.7563 billion ha) in the end of 1990. It disappears by 154.1 million ha (about 8%) within 10 years (15.41 million ha a year).

Tropical woods decrease (FAO 1993) million ha

	1 9 8 0	1 9 9 0	decrease	/ year
Africa	568.6	527.6	-41	0.7
Asia	349.6	310.6	-39	1.2
Latin America	992.2	918.1	-74	0.8

* The copyright of this article belongs to Creature National Institute for Environmental Studies.