

## **B-52 Effects of Global Warming on Local Vegetation and the Conservation in Asian-Pacific Regions**

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**Total Budget for FY1996-FY1998** 104,338,000 Yen (FY1998: 36,265,000 Yen)

**Key Words** Asian-Pacific Regions, Forest Ecology, Global Warming, Local Vegetation, Phenology

The effects of the global warming would differ depending on the geographical locations and the types of the vegetation. In the regions where global warming causes adverse effects on the vegetation, the vegetation would decrease its competence to remove atmospheric CO<sub>2</sub>, and some species would be endangered to disappear. The purpose of this research was to anticipate the possible effects of the global warming on the vegetation of different types in different locations in the Asian Pacific region. The results obtained from the research are summarized as follows:

- (1) Interrelations of the characteristics of past El niño and La niña events with phenological data, incidence of snow damage and others in Monsoon Asia were analyzed. The results showed that effects of ENSO on phenological events were regionally different and were correlated with the incidence and the characteristics of the El niño event of that year.
- (2) Growth examination of several tree species typical in China suggested that environmental change affects the growth of these species and changes in the composition of tree species in the habitats. Furthermore, data analysis and model analysis were carried out to anticipate the changes in climatic parameters related to vegetation and crop productivity in China.
- (3) Effects of global warming was investigated on snow cover and distribution and dynamics of snow-patch vegetation in Japanese forest. The result showed that plant distribution is most sensitive to the date of snow disappearance and that amount of snow cover played a major role in for the shrinkage of snow patch in spring and summer.
- (4) A computer simulator was developed based on the field measurements of long term and large area census plot of Ogawa Forest Reserve. The result of simulation of 400 years suggested that the component of tree species would change drastically by replacing the current present canopy trees with those whose recruitment rate are much higher. As a consequence of the replacement, the estimated total basal area (TBA) in the forest simulator decreased slightly.
- (5) Net primary productivity of rain forests was monitored on Mt. Kinabalu, Borneo, in order to predict the responses of the rain forests to global warming. It is predicted that the rise of 1°C air temperature will result in the gain of 67 (g/m<sup>2</sup>/yr) dry matter under relatively nutrient unlimited conditions, but in the gain of 104 (g/m<sup>2</sup>/yr) under relatively nutrient limited conditions because the demand for nutrients to fix unit carbon will decrease with temperature.