

Abstract: Global warming is likely to affect agricultural sectors. The previous studies focus on the direct impact of the temperature rise on the production or crop yields but don't consider the indirect impact on the agricultural sector via change in trade and industrial structure due to change in comparative advantage resulting from the temperature rise. In this study, firstly we explore how temperature affect the land productivity (crop yield) in the agricultural sector by estimating the land productivity function and simulate the impact of temperature rise in 2050. Secondly, we investigate how change in productivity due to temperature change affects the agricultural sector and GDP of each country/region via change in trade and the industrial structure using the GTAP model. Our main findings are (1) temperature rise is likely to increase the land productivity in the cold and cool-temperate zone. Some countries receive larger total impact than the direct impact, while the other countries does not, (2) In the temperate zone, temperature rise is likely to increase the land productivity of the countries with average temperature lower than 18 °C but to decrease that of the countries with average temperature higher than 18 °C. The countries with the negative direct impact and some countries even with the positive direct impact suffer a loss in total impact. (3) In the tropical zone, temperature rise is likely to decrease the land productivity, but the negative magnitude depends on the level of agricultural technology. Total negative impact on agricultural sector will become larger than the direct impact, since net import is increased in these countries due to loss of comparative advantage.