Guest lecture

“The cost of climate change in agricultural industries: coconuts in Sri Lanka”

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Nussallee 9, HS 10 (lecture room 10)

Abstract

Agriculture in low latitude countries such as Sri Lanka is already operating at the maximum temperature limits for crop growth and face increased production risk from expected climate change. Sri Lanka is a developing country with limited economic and technological capacity to develop adaptation strategies; hence more vulnerable to climate change than developed countries.

Coconut (Cocos nucifera L) is a rain fed perennial crop important in Sri Lankan culture, food consumption and the economy. It is the second most important food in the Sri Lankan diet after rice. Several studies have examined the impact of climate change on Sri Lankan agriculture, but none were conducted to simulate the impact of future climate change and future adaptation strategies on coconut production, or to calculate the economic welfare effects for different stakeholders in the coconut value chain.

In this paper we report the development of an economic model of the coconut value chain that allows prediction of welfare impacts, and a quantitative representation of coconut yield that allows the impact of changing climatic conditions on yield. The average outcome of 16 climate models was used to generate future climatic conditions, with two future climatic scenarios for 2020, 2030 and 2050 considered for three production regions. The most important yield estimate was a yield decline of more than 10 percent in the wet zone with the expected increase of maximum temperature. Without extra adaptation measures this is predicted to result in a loss to the industry of 4,795 Rs.Million annually by 2020, which is nearly 4.7 percent of the total value of the industry at equilibrium. The negative impact of climate change has the potential to be reduced with the implementation of additional adaptation practices. However, the cost effectiveness of these practices needs to be considered in comparing the practices. Wider adoption of fertilizer application at specific times and moisture conservation practices are estimated to be economically beneficial.

Webpage Professor Garry Griffith