The effects of climate change phenomena on cocoa production in Malaysia

ABSTRACT

Climate change is arguably one of the most important factors influencing agricultural production in developing countries such as Malaysia. Therefore, it becomes important to explore the impacts of climate change on agricultural yield and production. Cocoa was brought to Malaysia for commercial planting in the 1950s. The cocoa industry grew to become the third major commodity crop in Malaysia after oil palm and rubber. In 2013, Malaysia became 28th among the Cocoa-producing countries in the world. The way forward requires increased understanding and awareness to cope with the interdependencies and interactions of natural resources and climate change, the vulnerabilities and interdisciplinary efforts. This study applied the autoregressive distributed lag (ARDL) co-integration approach over the periods (1980 – 2014). There are two main methods including the Regional Climate Model (RCM) which can reasonably produce appropriate projections that can be used for climate scenario generation in a country-scale. Based on this information, this study considered three scenarios: 1) First Scenario, Rainfall changes 2) Second Scenario, Temperature changes 3) Third Scenario, Scenario 1 and 2 simultaneously. Preliminary results from the Autoregressive Distributed Lag (ARDL) model applied indicated that despite the projected changes in the climate variables (temperature and rainfall), in scenario 1 (the projected changes (5% increase) in rainfall), cocoa yield is expected to decline from 0.148 tonne per hectare (t/ha) in 2015 to 0.143 t/ha in 2020. The average trend compared to the baseline is positive and expected to develop by +3.83% annually. In scenario 2 (the projected changes (2% increase) in temperature), cocoa yield is expected increase from 0.149 t/ha in 2015 to 0.155 t/ha in 2020. The average trend compared to the baseline is positive and expected to increase by +1.76% annually. Similarly, in scenario 3 (the projected simultaneous changes (+5%) and (+2%) in rainfall and temperature respectively), cocoa yield is expected to increase from 0.154 t/ha in 2014 to 0.189 t/ha in 2020.

Keyword: Cocoa; Climate change; ARDL; RCM; MCB