The Effects Caused by Climatic Change on Sustainable Development of Agriculture in Guizhou Province of PRC

ABSTRACT

This paper, using the combination of both quantitative and qualitative analysis methods, discussed the impact of climate change on agricultural sustainable development in Guizhou province.

Firstly, basic situation of agriculture and climate was introduced, focusing on the vulnerability of agricultural development regarding ecological, economical and social conditions in Guizhou. On the basis of meteorological data from 1961 to 2015 collected at 27 sample sites province-wide, the characteristic and patterns of climate changes in past 55 years was summed up, and the future trend was predicted. The results showed that average temperature steadily rose by 0.085℃ per 10 years while average precipitation reduced by 18.5mm per 10 years, it was anomaly cold in 1976 and 1984 and anomaly warm in 2015, and least rainy in 2011, from 1961 to 2015 across the province. Thus, the tendency of less precipitation and higher temperature in the future was predicted.

Secondly, based on the data of temperature and precipitation from 1978 to 2015, the effects caused by climate changes on local grain yield was analyzed by modelling. The results showed that the precipitation co-integrated with grown area, labor and fertilizer inputs, has a significant positive impact on the grain yield, while the temperature does not. Besides, the relationship between climate change and sustainable development of agriculture was described qualitatively, especially referring to natural disasters such as droughts, floods, coldness, crop diseases and pests. As the climate changes, both drought and flood are more likely to occur in different areas and seasons, the harm from coldness may be lightened, while the pest and disease becomes unpredictable and so on, around the province.

Finally, the countermeasures and recommendations were proposed regarding the adjustment of cropping system, resource utilization, towards the adaptation and prevention for climatic change.

Key words: climatic change; sustainable development of agriculture; grain yield; Guizhou Province of PRC