**Abstract**

Agriculture in India is the most important segment of the economy. Growth of agriculture sector is crucial for Indian economy as it employs two- third of its population and contributes nearly one-third of national income. Hence the trends in Indian agriculture and the determinants of agriculture gross domestic product during the pre and post WTO regime based on Cobb Douglas production function was analysed. The study is based on secondary data for the period of 40 years from 1975-76 to 2014-15. The trend in area and production of major food grains (rice, wheat, coarse cereals and pulses) is analysed for pre (1975-1994) and post (1995-2015) WTO regime. It is concluded that, food grain production in India shows a positive growth after WTO regime but comparatively less than the before WTO period. Indian agriculture sector witnessed increasing returns to scale before and after WTO regime. Increase in the amount of fertilizer and pesticides no longer contribute to the growth of agriculture GDP.