This study examines the dynamic relationships among output, carbon emission, and population of China during the period of 1960 to 2009 by using auto regressive distributive lag (ARDL) model. In order to make the co-integration analysis robust, the paper applied Toda and Yamamoto causality test to understand the causal links among output, carbon emission, and population. The empirical results suggest that population significantly affect output whereas carbon emission does not affect output in the long run. The error correction model (ECM) version of ARDL model found deviations from long run equilibrium which is due to dynamics in the variables concerned. Toda and Yamamoto causality test revealed bi-directional causality between population and carbon emission and also between population and output. Empirical results signify that population can be considered as a powerful ingredient in the context of increase in carbon emission which is instrumental to environmental conservation in China.