

SPECIAL PANEL:

Climate Change in India

Panel Coordinator: Prof. Bishwanath Goldar (Institute of Economic Growth, University of Delhi)

bng@iegindia.org, b_goldar77@yahoo.com

Panel Abstract:

Some issues relating to climate change in the context of India are discussed in the three papers to be presented in the Panel. One paper uses a recursive dynamic computable general equilibrium model to assess the impact of two post-Kyoto climate policy regimes (one based on global carbon tax, the other based on emission trading permits) on GDP growth, CO₂ emissions and welfare in India, and concludes that significant reduction in CO₂ emissions can be achieved by India in the two policy regimes, though there would be some loss in GDP growth rate and in welfare during 2045-50. The second paper uses a static framework for analysis, utilizing estimated production functions for Indian manufacturing firms, and finds that significant cuts in CO₂ emissions from manufacturing is possible in India and that carbon pricing intended to cut down CO₂ emissions in India by 5 to 15 percent will not involve any major loss in industrial export performance. While the first two papers are basically concerned with costs associated with measures for averting climate change, the third paper is concerned with adaptation, particularly how behavioural changes among people can help in reducing mortality due to heat stress that can arise from climate change. Analyzing data for the state of Odisha in India, it is shown that creating awareness among the people on “dos and don’ts” in a situation of heat wave can greatly help in preventing loss of human life.

“The impact of carbon taxes on growth, emissions and welfare in India”

Prof. Basanta K Pradhan and Mr. Joydeep Ghosh (*Institute of Economic Growth, University of Delhi*)

Corresponding author: Basanta K. Pradhan - basanta@iegindia.org

Abstract:

The main objective of this paper was to analyze the impact of two post-Kyoto climate policy regimes on GDP growth, CO₂ emissions and welfare in India. The climate policy regimes are consistent with the objective of limiting the increase in average global temperature below 2°C over the long term. The first policy regime is a global carbon tax (CT), while the second policy regime is based on emission trading permits where the distribution of the permits is based on the Common but Differentiated Convergence (CDC) Approach (Hohne et al, 2006). A recursive dynamic CGE model that incorporates features of the energy system was used in the study. The results suggest that significant reductions in CO₂ emissions can be achieved under the two policy regimes. The maximum loss in GDP occurs during 2045-50. The growth rate loss falls from 4.3 percent in the BAU scenario to 3.2 percent in CT and 3 percent in CDC scenario, respectively. In other periods the decline in GDP growth rate is not more than 0.3 percentage points. The maximum welfare loss in terms of equivalent variation is estimated at 6 and 5.2 percent, in the CT and CDC scenario, respectively, in 2050. The results also suggest that India can comfortably meet

its target of reducing the energy intensity of GDP by 20 to 25 percent by 2020, in comparison to the 2005 level (Copenhagen Pledge).

Keywords: carbon taxes, CGE model, India, growth, welfare

"Reduction in CO₂ Emissions of Indian Manufacturing: Scope for Reduction and Likely Impact on Export Competitiveness"

Prof. Bishwanath Goldar and Ms. Meera Bhalla (*Institute of Economic Growth, University of Delhi*)

Corresponding author: Bishwanath Goldar - bng@iegindia.org, b_goldar77@yahoo.com

Abstract:

How reductions in CO₂ emissions of Indian manufacturing would impact the costs and export competitiveness of manufacturing firms is studied in the paper using data on manufacturing companies for 2007-08. The analysis, undertaken with the help of estimated production functions using alternate specifications, brings out that there is substantial scope for reduction in CO₂ emissions, through factor substitution and through reduction in technical inefficiency. Some earlier research shows that if India were to undertake a commitment for reducing emissions by 5 to 15 percent, then it would imply for the Indian economy an implicit (or actual) carbon tax of one to four US\$ per ton of CO₂. Analysis presented in the paper indicates that a carbon tax of US\$ 1-4 per ton of CO₂ would cause costs in industrial companies to increase, on average, by 0.09 to 0.33 percent and their exports to fall, on average, by 0.14 to 0.55 percent. The adverse effect on export performance will probably be greater because there will be indirect effects through hikes in the prices of materials used by the companies, as the carbon tax falls on the domestic materials suppliers.

Key words: Reduction in CO₂ emissions, Indian manufacturing, Export competitiveness

"Awareness as an adaptation strategy for averting health risk from Heat Waves in India"

Dr. Saudamini Das (*Institute of Economic Growth, University of Delhi*) - saudaminidas@iegindia.org; saudamini.das@gmail.com

Abstract:

Regular Heat Waves because of climate change is a prominent human killer in recent years. Heat waves are defined as an extended time interval of abnormally hot and humid weather extending from more than one day to several days, though there are some regional variations. During heat wave, the dissipation of metabolic heat of human body stops due to the slowing down of the evaporation of body perspiration and body has to work extra hard to maintain normal temperature. Thus core body temperature goes up due to heat stress and if it exceeds the threshold (normally 40 to 42 °C), the person collapses or may die. Heat waves are a global phenomenon affecting both developed and developing

countries and the coastal states of Odisha and Andhra Pradesh are the worst affected ones in India. With changed climate, adaptation is essential along with mitigation measures and one of the adaptive strategies has been to issue heat wave warning and undertake awareness campaign to bring behavioural changes in people to counter the health impacts.

The state of Odisha is undertaking an awareness campaign on dos and don'ts during heat waves, that started with the Disaster Risk Management (DRM) program of Government of India and United Nations Development Program in 2002 and is still going on. This program was implemented in 16 of the 30 districts of the state where the campaign was more intensive and there is report of both reduced mortality and morbidity in the state because of the campaign. The present paper evaluates the impact of Awareness program on heat wave deaths taking DRM district as treatment and the rest of the state as control. It shows some initial results from the research project that is evaluating the role of awareness campaign as an adaptation strategy for heat waves. The heat wave index as defined by the Indian Meteorological Department (IMD) is used and the death toll from heat stroke for the period 1998 to 2010 is analysed using a district level panel data set. Results show the programmed districts to have witnessed some reduction in death toll compared to non-programmed ones after controlling for heat wave conditions. The results show that the average death per district per year would have gone up from 7.75 to 8.15 or another 154 people would have died in the state in absence of the campaign. Thus, generating awareness on 'dos and don'ts during heat wave period' does seem to motivate people to change their behaviour that results in reduced mortality due to heat stress.

Key word: Heat Waves; Awareness; Disaster Risk Management; India; Natural Experiment