4th Annual CECFEE Policy and Research Workshop

16-17 November, Goa

Day 1

Introduction

Bringing together academics and practitioners, the 4th Annual CECFEE workshop was held in Goa from November 16th – 17th. Broadly, the workshop focused on the various ways in which a country engages with its physical environment: in particular, the struggle to grow but in a sustainable way. A significant goal of the workshop, outlined by Professor E. Somanathan, Program Director of CECFEE, in his introduction, was on encouraging interaction between academic disciplines and policy specialists within an informal setting. A majority of the presentations dealt with India, with some discussion about Kenya and China.

China's Future Growth Path

When talking about environment and development, China currently occupies a large part of the global stage. Professor Jintao Xu from Peking University addressed the future of China's growth in his keynote presentation. Coming on four decades of high growth, China's story has indeed been remarkable but now faces significant pressure to reduce carbon emissions. The immediate future of China's growth - over the next five to ten years - will thus be important but the environment is largely missing from a national discussion focused on aging and the population dividend. Using synthetic control methods, Professor Jintao demonstrated that China's emissions and growth increased after its accession to the WTO in 2001 while those of its trading partners declined. Both total factor productivity and carbon contribute to the export growth after 2002. Correcting price distortions to account for the externality of carbon use, therefore, can then reduce carbon emissions without compromising on growth.

Wildlife

Turning to problems at a more micro scale, the next session dealt with the conflict between human settlements and wildlife. Krithi Karanth of the Centre for Wildlife Studies demonstrated this conflict, documenting the ways in which wildlife impacts human lives and livelihoods. Across India, livestock losses as a result of contact with predatory species are a main feature of the conflict. In addition, crops are destroyed and individuals hurt or killed. Professor Sumeet Gulati from the University of British Columbia followed with an exposition of an ongoing study of the cost of conflict, using a sample of 6000 Indian households living near several national parks. Preliminary results suggest that costs drop to zero for households situated more than 15 kilometers from the periphery of the park for nearly all animals – pigs being the exception, for which costs stay high even as distances increase beyond 15 kilometers. Species that adapt to human settlements therefore cause more damage in total, since the number of incidents of contact are greater. Kartik Shanker from the Ashoka Trust for Research in Ecology and the Environment (ATREE) closed the session with a discussion centered on myths around the environment: for instance, a

cloth bag must be used 80 times to make up for the extra carbon emissions from cloth bags over single-use plastic bags but most campaigns only urge for a switch away from plastic.

Agriculture and Food

Agriculture is one sector of the economy that is expected to be hit severely by climate change, and impact it as well. The three papers presented in this session discussed problems in both agricultural demand and supply in India. Professor Ramaswami from the ISI spoke about the potential for contract farming to move production over to non-staple food commodities: with procurement prices for staples kept excessively high through government policy, supply distorts away from non-staples. The problem of crop burning in Punjab arguably arises at least partially from such distortionary intervention. Contracting with Multi-National Corporations, Professor Ramaswami argued, would ultimately help correct this distortion as they are able to offer a sizeable market and high prices for farmers. Yashodha from the International Rice Research Institute then discussed the problem of farmers not buying enough insurance in India. Through a choice experiment conducted in Odisha, she finds insurance literacy to be low, and trust in local government honoring its commitments to be crucial in driving preferences for insurance. Finally, Amlan Das Gupta from O.P Jindal Global University, using data from the National Sample Survey Organization laid out one of the potential impacts of changing climate on food preferences: extreme temperatures affect both the type of food and the diversity of food consumed.

Demographics and Gender

The demographic profile of a country affects its susceptibility and ability to adapt to a changing climate. A more youthful population suffers more from any adverse consequences but can also adapt and combat, while a rapidly aging one is negatively affected for lesser time but is less able to intervene. A long standing problem in India relates to the lower than expected numbers of adult women – a large number of women are thus missing. Professor Rohini Somanathan and two masters' students – Basil Isaac and Akansha Vardani - from the Delhi School of Economics suggested that inferring a bias in preferences from such a bias in outcomes is potentially problematic. Using simulations from a theoretical model, and survey data from the Census, they show that a bias in outcomes does not imply, nor is implied by, a bias in preferences. Shoibal Chakravarty from ATREE presented evidence of rapidly declining fertility rates in India, with no rise toward the end as suggested by the theory of demographic transition. Pointing toward a quality-quantity tradeoff, he suggested Indian parents are choosing smaller families but investing more in each child, with the ultimate result being lower population growth than currently predicted. Digvijay Negi from the ISI examined the link between child mortality and irrigation. Child mortality, he argued, is less sensitive to rainfall when groundwater irrigation expands. Expansion of groundwater irrigation delinks child mortality from income or price shocks, which rainfall acts as a proxy for.

With the day's proceedings coming to an end, all participants gathered for a photo shoot – indoors and outdoors.

Day 2

Air Pollution

Indian cities have some of the most highly polluted air in the world, as measured by the concentration of particulate matter (PM). The first session of the second day was devoted to this topic: Dr. Sagnik Dey of the Indian Institute of Technology at Delhi gave a wide ranging talk over various aspects of air quality management in India, covering both the science and policy aspects of it. In particular, he pointed out a severe lack of monitoring of rural areas, and showed evidence of risk functions being non-linear in exposure to particulate matter no greater than 2.5 microns in diameter. While household emissions account for nearly half of all exposure in the northern belt of the country, these are expected to decline. Sanjay Juvekar from the KEM Hospital Research Centre briefly highlighted the various deleterious effects of air pollution on health, suggesting that while some of these adverse effects have only been discovered recently it is the most important health risk at the moment. Households respond to perceived poor quality of air, but being unable to measure it, may not take enough precautions. There is a need for more research to be carried out over long enough time periods and generate larger samples. Finally, Manish Grover from the Indian Oil Corporation presented various facts about the Pradhan Mantri Ujjawala Yojana: this is a scheme designed by the Government of India to replace traditional high polluting cooking fuel with liquefied petroleum gas (LPG) for households living below the poverty line. At present, more than 57 million households have benefited and LPG coverage has increased from 56% to 89% of all households in India between 2014 and 2018 – remarkable growth for such a short time frame.

Continuing the theme on air pollution, Prachi Singh from Brookings-India and a PhD student at the ISI, showed results from a study evaluating the impact of exposure to outdoor air pollution on child health. Using data from the fourth round of the National Family Health Survey, together with geo-coded data pollution, rainfall and pollution data, she finds in-utero and post-natal exposure to pollution has a negative effect on child health. This effect is estimated from fire events: households upwind of fire events are not affected by the pollution coming off the fire while those downwind would be; a comparison of the two estimates the effect. Eshita Gupta of KPMG in her presentation looks more closely at the effect induction stoves have on indoor pollution. This study uses variation in electricity availability due to power outages, with the effect of induction stoves being compared within the same household when power is available and the stove can be used to when power is out and the stove cannot be used. Typically households tend to use both induction and traditional stoves together, even when power supply is erratic. While induction stoves cut down on pollution, this impact may not be enough to offset the exposure that happens during cooking.

Energy Infrastructure

The next few papers discussed electricity infrastructure and the political background within which is built and maintained. Ashwini Swain from the Center for Policy Research presented a summary of a recent book released by the Center on the interaction of politics and power sector reforms in India. Typically, big-bang style reforms have not been successful in terms of political sustainability while managerial reforms have allowed for some entrepreneurism in politics in some states. State specific reforms are what

is needed, while attempting to delink politics from reform is not feasible and perhaps not desirable. Kenneth Lee from the Energy Policy Institute at the University of Chicago presented results from a study on rural electrification in Kenya, which found disturbingly little benefit in extending electricity supply to rural areas. This result sharply contradicts existing research which typically finds large benefits of expanding electricity supply, and suggests Kenya's expansion of rural electrification is likely to generate large losses.

Developing on electricity infrastructure, Shweta Kulkarni from Prayas summarized information about the Electricity Supply Monitoring Initiative (ESMI). This initiative consists of setting up monitors in households that records minute-by-minute information on the quantity and quality of electricity supply. In addition, it collects information on appliance use and thus increases demand side information. Aditya Chunekar, also from Prayas, then followed with a presentation on residential energy consumption patterns in India, particularly over the adoption of new technology. The Ujala program for LED bulbs is an example of this: LED bulbs appear to have replaced CFL bulbs but mostly in urban areas. Quality concerns persist about LED bulbs. Finally, Lorenzo Montrone from the Mercator Research Institute presented ongoing work over a series of country case studies on the political aspects of coal. The presentation dealt specifically with India, and the complexities of moving into a solar age when solar panel costs are low but the political costs of moving away from coal are also high.

Manufacturing

How Indian industry responds to increasing temperatures will increasingly be important as India continues its structural transformation. While higher temperatures slow aggregate gross domestic product, the exact mechanism through which the non-agricultural sector is impacted is yet unknown. Professor Somanathan presented ongoing work using data on production lines that suggests heat stress lowers worker productivity, which reduces output. Air conditioning can be employed to counter this effect, but tends to be deployed over those parts of the production process where labor contributes significantly.

Student Presentations

Student presentations – all from the ISI – rounded off the conference. Vivek Ghosh outlined a strategy to estimate the effects of household fuel choice on child health, using the location of LPG distributors. Rishabh Choudhary followed with ongoing work estimating the effect of coal fired power plants on particulate matter concentration utilizing discontinuities in electricity production. Hrithvik Pandey concluded with an approach to estimate elasticities of petrol and diesel fuels, motivated by the fact that the social costs of these fuels are vastly different.