

The Description of Development in India Through Indicators of Direct and Indirect Household Energy Consumption

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- 8) **External researcher(s):** no entry
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- 11) **Short Summary:** The project aims at quantitatively analysing total direct and indirect energy requirements of households in India for the period 1983 to 2001. Variations in energy use observed across different households and changes in quantum and pattern of energy requirements observed

over time will be analysed.

12) Keywords: Applied Statistics/Biometrics, Economics, Economics of Developing Countries, Empirical Economics, Energy Economics

13) Project description:

Energy services constitute a sizeable share of total household expenditures in developing countries. In India the household sector is characterized by widely varying energy consumption patterns across low, medium, and high-income classes in rural and urban areas. Average per capita direct energy consumption is low compared to developed countries and even world average figures. However, the demand for energy using services in the household sector has been growing at an increasing rate in the last decade or so and is likely to expand rapidly in coming years too. Given this scenario and the growing share of India in global energy use and CO₂ emissions, it is important to analyze the factors that are contributing to the growing energy use in India. This project aims to do so by quantitatively analyzing total direct and indirect energy requirements of households in India using a large database on household consumption for the period from 1982-83 to 2001. More specifically, the main objectives of the project are to analyse -

energy use both direct and indirect (embodied), by different categories of consumption for households in India

changes in energy consumption over time of different end-uses and energy carriers for different categories of households and consumption

the relative importance of social, economic, structural and technical factors driving changes in total household energy use over time; and

an analysis of household demographic, socio-economic and infrastructural factors affecting cross-sectional variation in total (direct and indirect) household energy requirements.

Using unit record data from a very large dataset of household budget surveys conducted by the Indian Government's Department of Statistics and input-output transactions tables for the economy, the total (direct and indirect) energy use of Indian households, spanning the period from 1982-83 to 2001, will be calculated. Total (direct and indirect) energy use of Indian households amounts to more than 70% of all energy use in the country. The remainder comprises government use and the energy content of net investments and net exports. In all our analysis non-commercial energy or biomass use is included as well. At the micro level, household budget data is used to determine direct and indirect energy use for different categories of households (rural/urban, different income classes, geographic location, etc) and different categories of household consumption expenditure. That is, the energy contents of all expenditures will be calculated by multiplying the expenditure amounts by the appropriate energy intensities. Macro (National Income Accounts) data in the form of Input-Output tables for the economy as a whole and Energy Statistics are used to calculate the total primary energy intensities for the different goods and services consumed by households. Cross-sectional and time series analysis of total household energy use will then be carried out to determine those types of energy carriers and end uses that have exhibited the most increase and those that are showing the fastest growth. Analysis to determine the key factors driving the increase and key household groups that are experiencing the fastest increase will also be carried out.

14) Popular description: no entry

15) Graphics: no entry

16) Publications:

- Goldblatt, D., Pachauri, S. and Scheller, A. 1999-12-31. Energie und Nachhaltigkeit. Einsichten in die Konstruktion von Indikatoren. Bulletin ETH Zürich, (276), 20-23.

- Pachauri, Shonali. 2000. A First Step to Constructing Energy Consumption Indicators for India. CEPE Internal Report.

- Pachauri, Shonali. 2003. An analysis of cross-sectional variations in total household energy requirements in India using micro survey data. Energy Policy, Elsevier, (Forthcoming).

- Pachauri, Shonali and Spreng, Daniel. 2002-04-30. Direct and Indirect Energy Requirements of Households in India. Energy Policy, Elsevier, (6/ 30), 511-523.

17) Links to important web pages:

- <http://www.cepe.ethz.ch>