Carbon Footprints and Household Consumption Pattern in India: A SAM Based Analysis

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Author: Radhika PIPLANI

The discussions at the Paris Climate Summit to limit the temperature rise to 1.5â•°C above pre industrial level makes it imperative for countries dependent on oil, coal and gas to find alternative sources of energy. At present, India shares lesser obligations for such a high target; however, it is not quite far when some stern measures would have to be taken by the political leadership. India, being one of the fastest growing developing economies, has recently opened its door to foreign investment in technology and infrastructure. Such measures necessitate actions to curtail the influx of carbon emissions. With growing need and demands of the household sector, there is ought to be increased energy consumption through services like transport, electricity, construction, agriculture and allied activities, durables amongst others. This aggravates the capacity of the carbon sink through increased carbon footprints. The situation has not been accounted for adequately in Indiaâ€™s 12th Five Year Plan (2012-17). With limited number of empirical studies undertaken for India in this domain, this particular research paper tries to overcome the research gap and directs attention to pertinent policy questions.

In this study it is shown how the latest available Social Accounting Matrix of India (SAM) can be used to enumerate the direct and indirect carbon emissions required to satisfy a given consumption demand by the household sector. The 78 sector SAM is modified to 16 broad sectors on the basis of end use by the household sector and relative homogeneity along the technological lines. The emphasis has also been given to the manufacturing sector keeping in context with Indiaâ€™s changed political ideology. The broad sectors identified in the study are agriculture and allied activities, coal, natural gas, petroleum, mining, textiles, durables, chemicals and fertilizers, cement, non metallic products, metals, machinery (capital goods), other manufacturing, construction, electricity and services. The energy sector has been kept at a disaggregated level through sectors like Coal, Natural Gas and Petroleum. This study makes use of the emission coefficient by fuel type for Coal, Natural Gas and Petroleum to calculate the emission intensity per unit of output demand. The three factors of production land, labour and capital have been divided into labour and non labour component while the households have been disaggregated according to rural and urban areas. Private Corporation, Public Enterprises, Government, Net Indirect Taxes, Capital Account and Rest of the World have been kept exogenous in the study. In this study we derive the fixed price multipliers on the basis of the assumption of excess capacity which keeps the prices constant. Through the SAM framework the exogenous shock in terms of increased household demand will determine the carbon footprints of per unit output demanded.

Key Words: Carbon Emissions, Household Sector, Consumption, Social Accounting Matrix