

## Implications of healthy diet in India - An economy, environment and nutrition nexus approach

Topic: Input-Output Analysis: Sustainable Production and Consumption Policies - V

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India is one of the most populous countries in the world at 1.39 billion, endowed with the “demographic dividend” of the largest shares of working age population (58%). Despite being host to a relatively young population, the public health status of the country remains alarming. Non-Communicable Diseases are responsible for 5.87 million deaths annually, constituting 60% of the total deaths in India. India ranks second in terms of the number of diabetic patients after China and around 135 million or approximately 10% of the Indian population were affected by obesity. In India, the NCD mortality between 2006-15 led to a projected cumulative loss to the national income of USD 237 billion and by 2030 the productivity loss is expected to be 17.9 million years.

The WHO recommends four key points to ensure healthy diet practices “ i) energy intake (calories) should be balanced ii) Fat intake should not exceed 30% iii) limiting intake of sugars to less than 10% and iv) salt intake to less than 5g per day. In India, the daily calorie intake varies, with the highest and lowest decile urban population based on Monthly Per Capita Expenditure consuming 3,079 kcal/day and 1,643 kcal/day. However, some similarities were observed across different categories. The animal and plant-based protein and fruits and vegetable intake is lower than the reference diet across urban and rural regions, whereas whole grains consumption is higher than the reference diet, except amongst the richest households who, in turn, consume higher share of processed food. The average Indian household sources 47% of its calorie intake from whole grains of which 70% is constituted by cereals and consumes more starchy vegetables, dairy, and palm oil compared to the reference diet.

The promotion of a balanced healthy diet for optimal nutritional intake is expected to have significant economic ramifications, since the changes in the consumption pattern of the households will have an economic impact on the agricultural supply chain, particularly in India with 54.6% of the total workforce employed in the agriculture sector while contributing 17.8% to the country’s Gross Value Added. Along with the economic implications of the changing food consumption pattern, the sustainability of the food systems needs to be ensured. In India, the agriculture sector constitutes 14% of the total GHG emissions of which CH<sub>4</sub> constitutes the highest share (72%) from enteric fermentation and rice cultivation, followed by N<sub>2</sub>O (21%) directly and indirectly from agricultural soils.

The issue of addressing unbalanced dietary habits is largely directed towards the young working age population in urban regions from public health as well as economic perspective. As of 2021, 34.6% of the population resided in urban regions in India and 58.4% of the total population are “adults” or the working age population which is expected to increase to 37.2% and 61%, respectively by 2030. Thus, the nexus between nutrition, the economy and environment will be comprehensively addressed to ensure the welfare of the country.

The economy-wide impact of changing dietary patterns and nutritional disorders has not been investigated thus far in India. Studies on the economic impact of healthy dietary patterns and the consequent environmental impact of changing food systems are mutually exclusive from each other.

Given this backdrop, the objectives of the study are listed below:

i) To evaluate the economy-wide impact of adopting a healthy diet in India by bridging the gap

between the actual and required nutritional intake recommended by the EAT Lancet commission and the Indian Council of Medical Research and National Institute of Nutrition, India across different working age groups amongst the urban population using the Indian Supply Use Table 2018-19.

ii) To estimate the GHG and water footprints by following the healthy diet guidelines in different scenarios, combining different food habits.

The GHG emissions per kg of food for 36 broad food groups were adopted from Green, et al., (2018). To estimate the total (direct and indirect) water footprint, the green and blue water usage for agricultural crops were adapted from the Water Footprint Network (Mekonnen & Hoekstra, 2011). The cumulative expenditure on the crops, fruits and vegetables, livestock, and fish products is mapped with the Annual Per Capita food consumption in urban India, derived from the latest National Sample Survey.

By studying the backward linkages of diverse categories of food items, growth in GDP and employment generation is expected to be witnessed in the economy while converging towards the reference dietary recommendation. With an increase in the working age population which largely constitutes the middle-income groups, the meat, and other animal-based protein intake is expected to increase with changing lifestyles and eating habits. This would imply an increase in the GHG and water footprint.