

NEWS FEATURE: Changing course

Health improvement and nutritional change could be an innovative route to emissions reduction. It makes sense to combine these previously divorced aims by measuring the carbon impacts of diet.

Elisabeth Jeffries

It is easy to make people obese or give them diabetes. Feed them with plenty of fatty, salty, processed snacks and sugary drinks, and these conditions — commonplace in mature economies and rising in industrializing countries — may result. Farming and food emissions could increase at the same time, but this connection is currently obscured. However, a new carbon inventory of an entire food chain will help bridge these conventionally separated concerns. In a three-pronged investigation of health, diet and emissions, scientists funded by the Wellcome Trust (a charitable foundation that supports health research) are mapping out the climate impacts of India's eating habits.

“This is about for the first time going into a poor country and saying: what are the emissions associated with your diets? It is about raising awareness within a massive country like India about its position and dietary footprint. It is about signalling that the transition from a traditional to a much more processed diet has poor consequences for greenhouse gas (GHG) emissions and health,” says project leader Alan Dangour, head of the Nutrition Group at the London School of Hygiene and Tropical Medicine.

The goal is to obtain a detailed picture of what people are eating throughout India and where the nutrition transition towards a more western high-fat, high-sugar diet has already led to an explosion of non-communicable diseases. The impact of each type of diet on people's health will be calculated, as well as how environmentally sustainable it is. The study is motivated by the trust's new strategic vision connecting environment, nutrition and health.

Most countries have ignored this triple alliance, and India is no exception. Its nutritional agenda reflects very different worries from those in more mature economies. “The government has not had time to develop policies yet on sustainability, health and development,”



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Vendor with vegetables at a market in Jaisalmer, Rajasthan, India.

points out Sutapa Agrawal, a population scientist at the Public Health Foundation of India. Hunger is a greater priority, and food security a government target. According to the Global Hunger Index, 30.7% of children under five are underweight in India¹.

But the picture is mixed. As the economy develops and incomes rise in different social segments, diets and shopping patterns alter: “In the last two decades eating habits have changed. The population is becoming more urban — there are more nuclear families and more couples with one or two children. Working couples are flourishing, even in rural areas. Previously corner shops typical of India stocked cereals, now it's snacks, sweets and sugary beverages,” says Agrawal.

At the same time, the supply chain has been evolving and becoming more complex. Retail is rapidly growing and modernizing and quickly entering rural

and urban food markets. The food processing industry is concentrating and enlarging. The wholesale sector has modernized with the penetration of logistics firms and specialized wholesalers. Supply chains are shortening as village brokers become less important and public wholesale markets and wholesalers buy direct from farmers.

Meanwhile, cold stores (a type of refrigerated warehouse) have expanded rapidly, taken on wholesale functions, and provide credit to farmers. The private sector has become the main player in this section of the economy as the country moves through the transition to food industrialization². If food supply chains follow the pattern of developed countries, concentrations of competing powerful corporations emerge. They drive greater productivity and engage suppliers of raw materials in tight contracts, with a consequent impact on food quality.

Some major national and global grocery companies have already reached this stage in India.

Not surprisingly, this process is accompanied by changes to agriculture. Following the nation's green revolution of the 1960s and 1970s, the country replaced millet cultivation with wheat and also rice, a crop that uses water more intensely. Most farmers are smallholders, although a few Indian conglomerates like Tata and Reliance are also landowners. "We are now seeing high volumes of energy-dense foods like hybrid cereals from China and certain types of temperate foods. Apples and berries are grown that are not native to India, while there's an increased consumption of non-vegetarian food like beef, goat, chicken and freshwater fish," explains Agrawal.

As in many countries, land clearance for livestock rearing is releasing greenhouse gases, and Indian agricultural emissions are the fourth highest in the world. Agriculture accounts for 23% of India's total emissions. Climate change is already having an impact — the monsoon season is unreliable, and does not always produce the rain expected. Monsoon sorghum grain yield is projected to fall by 2 to 14% by 2020. A large reduction in wheat yields is predicted unless appropriate action is taken, affecting the ~200 million people whose food intake relies on crop harvests. In parts of India, current temperatures are already rising to the critical levels that could shorten the growth period of the rice plant. Estimated national agricultural loss in 2030 could amount to more than US\$7 billion, severely impacting the income of 10% of the population, if nothing is done³.

Meanwhile, Indians are suffering from new types of illnesses. A greater proportion of the population now has the type of non-communicable diseases typical of developed economies, such as diabetes, heart disease and cancer. "You see obese and underweight individuals in the same households — it's a health time bomb," comments Bill Vorley of the Sustainable Markets Group at the International Institute for Environment and Development.

For instance, India has the second highest diabetic toll in the world at 66.8 million, a figure likely to climb by nearly two thirds to 109 million by 2030, according to the International Diabetes Federation. "Obesity appears to be spreading across India at least partly as a result of an invasion of processed Western food. India's economic boom has been accompanied by a meteoric increase in the

number of people with diabetes," remarks the organization on its website.

It is this health trend that the Wellcome team would like to see reversed. Measures taken at the right point in lower-income countries could divert the trajectory of diet experienced in Western countries. "People move from a very poor diet, which is very cereal-based, to a diet which has some cereals, quite a lot of complex carbohydrates and fibre, like rice, millet, sorghum, increased amounts of pulses, fruit and vegetables, a little bit of meat, a little bit of eggs and fish", says Alan Dangour. The next step — "a very high salt, high fat and high sugar diet" — needs to be averted.

Perhaps one of the most puzzling questions is the attraction of unhealthy diets as economies urbanize. The inclusion of addictive salts and sugars is one explanation, but culture is another. "In poor countries, fat is a sign of wealth, but the opposite is true in rich countries. It's a question of status and showing you can afford to be large," explains Dangour.

It is a habit not fully understood. Variety and branding are probably also motivating consumers. As India has developed, a greater mix of food has been introduced. "After 2000 and the Internet, everything came together. People eat traditional typical staples, rice, wheat, curry and vegetables, while eating in restaurants and going out has become very popular and different fats and oily vegetables are very common. People eat more foreign food, pasta, pizza and burgers but are not eating properly," says Agrawal.

Street markets could provide a way into healthier eating, if well regulated. Both poor and middle-class people visit street markets, which are a typical feature of many developing countries. "If you go to Indian cities the street food is absolutely delicious and it's totally ubiquitous but it's fried, it's sugar, it's salt, it's bad," says Dangour. However, market vendors are often viewed as a nuisance and harassed by local government and police.

Nevertheless, street markets are a potential change agent because they link rather than separate local suppliers and consumers. "In India, 80% of the economy is informal. Vendors are extremely important. Urbanization should accept these people rather than sweeping them aside. They need light touch formalization and a strong voice," comments Vorley.

According to the International Institute for Environment and Development, the Indonesian city of Surakarta provides a good example of well-judged local action involving sectors often ejected during urbanization, and including them as an

economic asset. As in many developing countries, much of the food there used to be sold by individual vendors in street markets or on city sidewalks, pedestrian bridges and streets. They were often viewed by local authorities as eyesores or tax-evading enterprises, and forcibly evicted to make way for shops. Local governments often believe urban areas should be adapted to modernized sectors with high economic value.

But a new mayor elected in 2005 took a different approach. Joko Widodo held a public consultation with the vendors. They agreed to be relocated to particular places, and their contribution was legalized and formalized. At the same time, parts of Sukarta were cleaned up and food shelters and bazaars attractively arranged in different locations of the city.

By 2014, around three quarters of street vendors had been relocated to shelters and the mayor had become President of Indonesia. Since then, the city has become new destination for gastronomy, fashion and creative arts. Local sources indicate the majority of population of the city has benefited from these informal sectors, which have helped lift it up to a new level of economic development.

"This experience contrasts strongly with many other cases, such as Harare in Zimbabwe, in which vendors were brutally swept away," says Vorley, suggesting different approaches are possible. "We need to look at alternative and more inclusive routes to urbanization than models of highly concentrated urban food systems in the hands of food manufacturers and retailers," he says.

A number of other dietary policies have been tried out⁴. For instance, the Mexican congress passed taxes on soda and junk food in 2013, and early indications suggest it has reduced sugar consumption. Several other countries are also considering following suit. Trade and regulatory measures have also proved effective in reducing the availability of unhealthy foods and changing dietary patterns in the population. In 2000, Fiji banned the supply of mutton flaps, which are high in fat, while Mauritian regulation was directed at reducing saturated fatty acids in cooking oil and replacing them with soybean oil.

In the UK, a range of government programmes have made a difference. "Industry agreements have been aimed at changing the type of fat in crisps or moving from full to semi-skimmed milk. Industry is more than delighted, as it can use the fat for something else," notes Alan Dangour. In India, the same types of campaigns could develop, enabling people to enjoy

healthier food in existing menus. “In India they make industrially produced ghee that has a very poor health record and is full of trans fats, which are unhealthy, so government regulations on that would have a tremendous impact,” says Dangour.

A healthy diet is automatically environmentally friendly. But rising incomes and urbanization could mean that individual countries abandon traditional diets and replace them with unhealthy food high in refined sugars, fats, oils and increased consumption of meat. If so, they could be a major contributor to an estimated increase of around 80% in agricultural greenhouse-gas emissions by 2050. Less harmful diets have been identified alongside moderate and balanced consumption including occasional

meat-eating. They include vegetarian, pescatarian and Mediterranean⁵.

Indian authorities are investigating measures to correct these diet trends: “the marketing of unhealthy food products that are rich in fat, sugar, and salt, is powerful and persuasive. The WHO is urging countries to take action to reduce the exposure of such marketing especially targeted at children by implementing a set of internationally-endorsed measures,” points out Nata Menabde, WHO representative to India.

The effect of nutritional policies on food and farming emissions is usually screened-off. But public nutrition campaigns often work well, because people feel the impact of diet immediately. By contrast, they usually ignore environmental impacts, which

often seem remote. Health improvement through dietary change could therefore be an innovative route to emissions reduction. It could also help developing countries leap-frog some of the problems of industrialized nations. □

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