ACIAR SDIP Foresight Program: Status Report

DIETS in EASTERN GANGETIC PLAINS of SOUTH ASIA:

Brief Assessment of Sources & A Comparison with the EAT-Lancet Recommendations

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Highlights

- What we eat and how we produce it has a tremendous impact on both human health and the environment.
- People in Bangladesh, India (Bihar and West Bengal) and Nepal consume too much rice and wheat and too little plant proteins and fruits. Poor diets are a big reason for persistently high levels of hidden hunger in Eastern Gangetic Plains (EGP).
- High incidence of poverty and excessive policy emphasis on rice and wheat are key factors behind the overconsumption of cereals and low consumption of protein-rich foods and fruits in the region.
- Consumption of unhealthy processed, packaged and purchased foods is rising in the region, but we do not have reliable data on the scale of this problem.
- Foods like unhealthy snacks are not only leading to a rise in consumption of sugar, salt, saturated fats, and highly processed flours but also crowding out the consumption of healthy foods like fruits and vegetables.

Introduction

Food is as much an environmental issue as it is a health issue. What we eat and how we produce it has a tremendous impact on both human and planetary health. Most Global Burden of Disease risk factors are linked to diet (Figure 1) (Afshin et.al. 2019). At the same time food production, processing and trade also affect multiple environmental variables like freshwater resources, soil quality, forest cover, biodiversity, coastal eutrophication, and climate change. Our existing food system is unhealthy not only for humans but also for the environment. This is the point of departure for the EAT-Lancet Commission. The Lancet Commission report (2019) sets out to answer the following question:

> *What could we eat that would feed 10 billion people in 2050 a healthy diet within the environmental limits?*

For environment, the commission has set scientific targets for earth system processes like climate change, nitrogen and phosphorus cycles, freshwater use, biodiversity loss, and land-use change for sustainable food production. On the consumption side, the report lays out a reference diet with 8 food groups (further divided into subgroups) and their daily optimal calorific and macronutrient intake for individuals 2 years old and above. The food groups include whole grains, tubers or starchy vegetables, vegetables, fruits, dairy food, protein sources, added fats and added sugars. The diet stipulates that most of a person's daily intake should be coming from plants, especially whole grains, fruits and vegetables, legumes, and nuts. Consumption of poultry, eggs, and fish should be "modest," and red meat, "if any," should be low. They suggest a healthy diet with appropriate caloric intake, diversity in plant-based food, low consumption of animal source food, unsaturated rather than saturated fats and small amounts of refined grains, processed foods, and added sugars.

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EAT-LANCET report recommends a universal, but not a uniform diet. The EAT-Lancet reference diet is different from the existing recommended dietary allowances (RDAs), like the one by the Indian Council of Medical Research (ICMR), because the former also takes the environmental footprints of different foods into account while the latter focus only on the human nutritional requirements. Accounting for environmental footprints makes EAT-Lancet recommend a more vegetarian diet than a typical RDA. This status report does not discuss the environmental aspects of the reference diet. It only compares diets in Bangladesh, Bihar, West Bengal and Nepal with the EAT-Lancet reference diet and highlights the deviations.

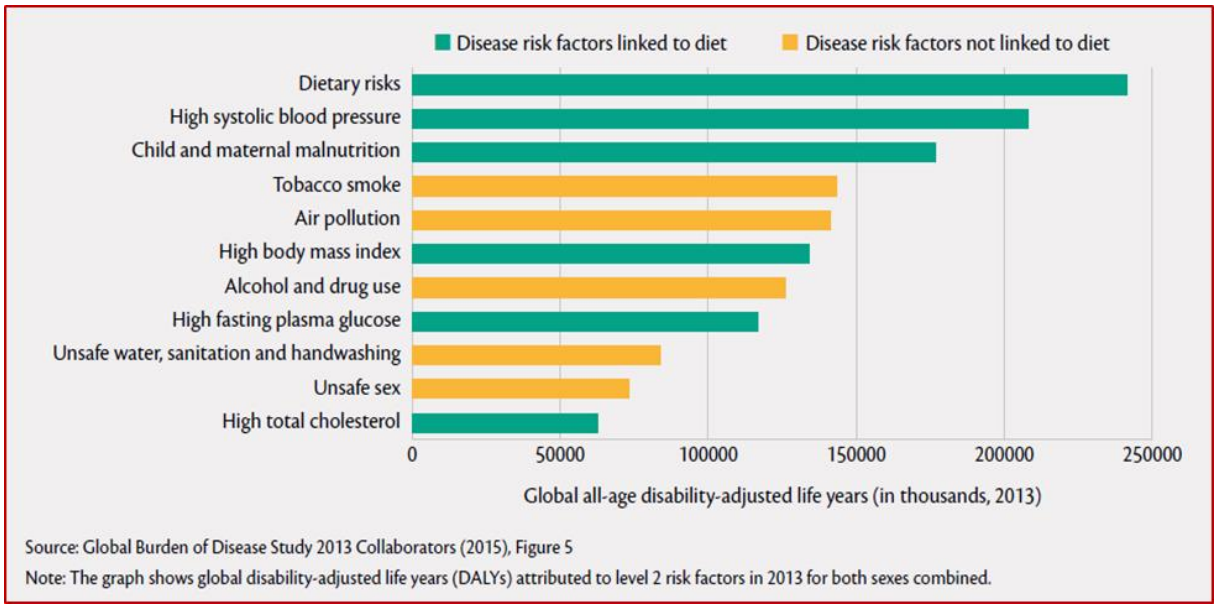

FIGURE 1 DISEASE RISK FACTORS LINKED TO DIET AND OTHER CAUSES

Data

The report uses data from three different sources for the three countries it covers. For Bangladesh, we use the food consumption data from the Bangladesh Integrated Household Survey (BIHS), conducted by IFPRI, from January to May 2015. BIHS 2015 has data on quantities consumed per week for 257 food items for a representative sample of 6435 rural households in Bangladesh. We divide weekly consumption by 7 to get the daily consumption and then adjust it for the number of members in the household to obtain the daily per capita consumption values.

Consumption data for Bihar and West Bengal are taken from 'Household Consumption of Various Goods and Services in India (2011-12)'—a report published by the National Sample Survey Organization (NSSO) based on a consumption expenditure survey of 0.102 million rural and urban households in 2011-12 from all parts of India. The NSS data is representative at the state level and provides monthly per capita consumption data of an extensive list of food items. We get the average daily per capita consumption quantities by dividing monthly household consumption data by 30.

Consumption estimates from the Nepal Annual Household Survey 2015-16 report (AHS 2015-16) are our main source of data for Nepal. The report, based on a survey of 4500 households from both rural

and urban Nepal, provides average per capita consumption of 58 different food items for both rural and urban households. The food list in the AHS report is not extensive, but it still gives us a decent estimate of the consumption patterns.

The nutrition chart published in a report on the Nutritional Intake in India 2011-12 by NSSO has been used to calculate the calorific values of different food items consumed across the 3 countries.

Results

The EAT-Lancet diet recommends a 2500 kcal daily energy intake. The average daily calorie intake in rural areas of all 4 regions of EGP is below this level (**Figure 2**). Therefore, we compare calorie shares (%) of different food groups in the diets in EGP with the EAT-LANCET recommendations and not the total calories (**Figure 3**, **Figure 4** and **Figure 5**).

Table 1 shows the calorie shares of different food groups recommended by EAT-Lancet. We have made a small change in the original EAT-LANCET recommendation by splitting calorie share from proteins into the shares of plant and animal-based proteins.

TABLE 1 EAT-LANCET RECOMMENDED DIET (CALORIE SHARES OF DIFFERENT FOOD GROUPS)

EAT-Lancet Recommended Diet (Calorie share of food groups)	
Whole grains	32.4%
Potato and Cassava	1.6%
All vegetables including spices	3.1%
Fruits (fresh + dried)	5.0%
Dairy Products	6.1%
Protein Sources	29%
Added Fats	18%
All sweeteners	4.8%
Total	100.0%

EAT-Lancet vs Eastern Gangetic Planes Calorie Intake

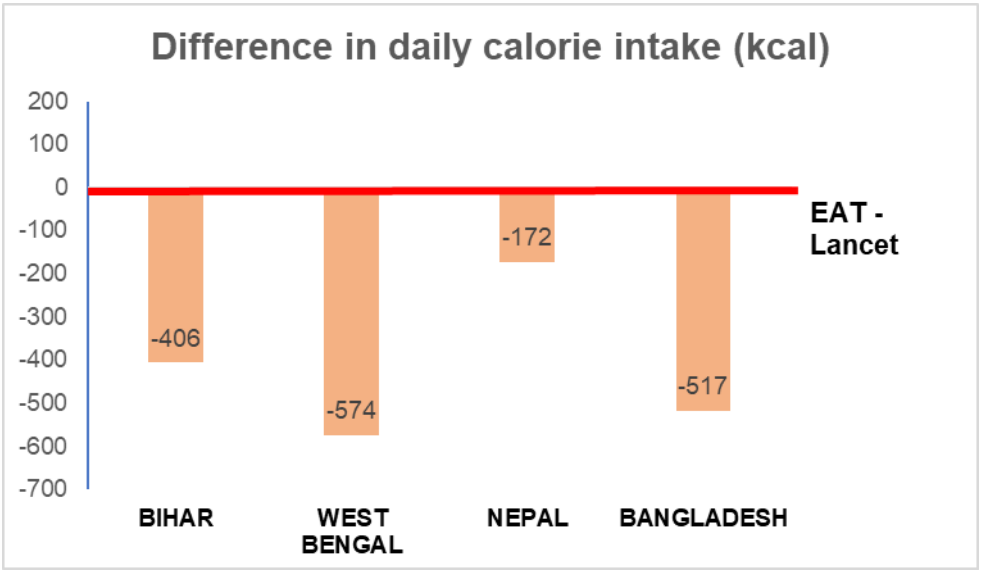

FIGURE 2 DIFFERENCE IN AVERAGE DAILY CALORIE INTAKE OF BIHAR, WEST BENGAL, NEPAL, AND BANGLADESH WITH EAT-LANCET RECOMMENDED DAILY CALORIE INTAKE OF 2500 KCAL/PERSON

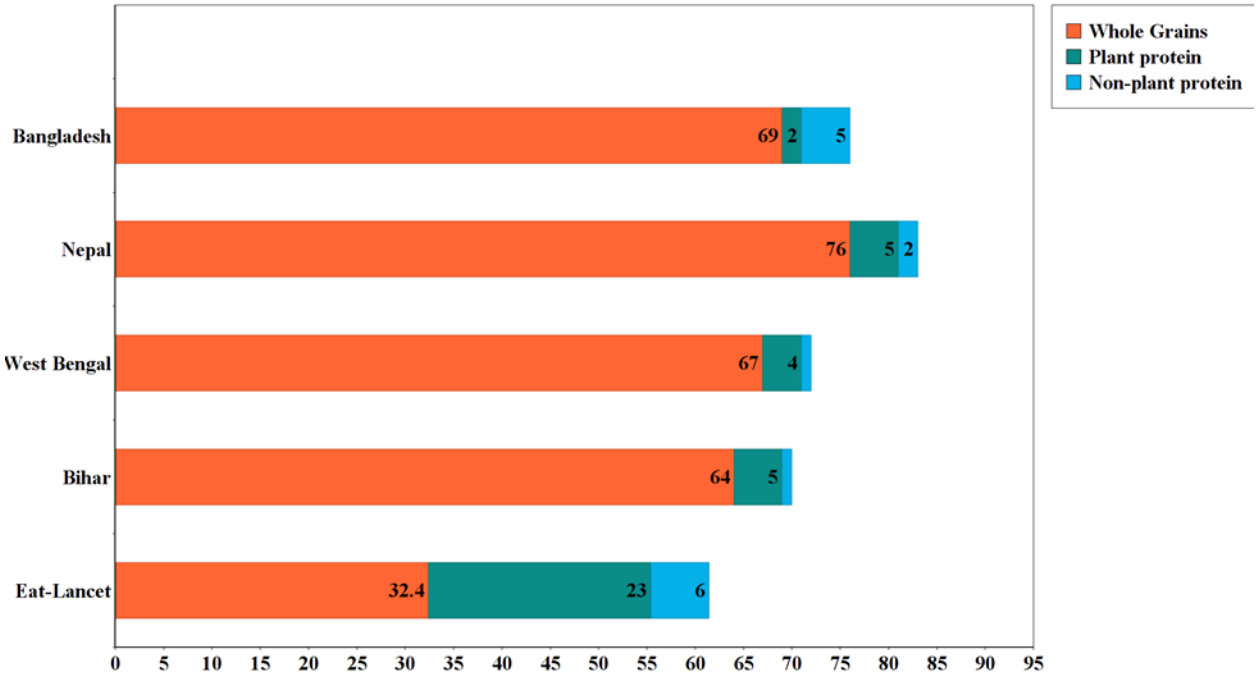

FIGURE 3 SHARE OF CALORIES (%) FROM WHOLE GRAINS, PLANT PROTEIN AND NON-PLANT PROTEIN

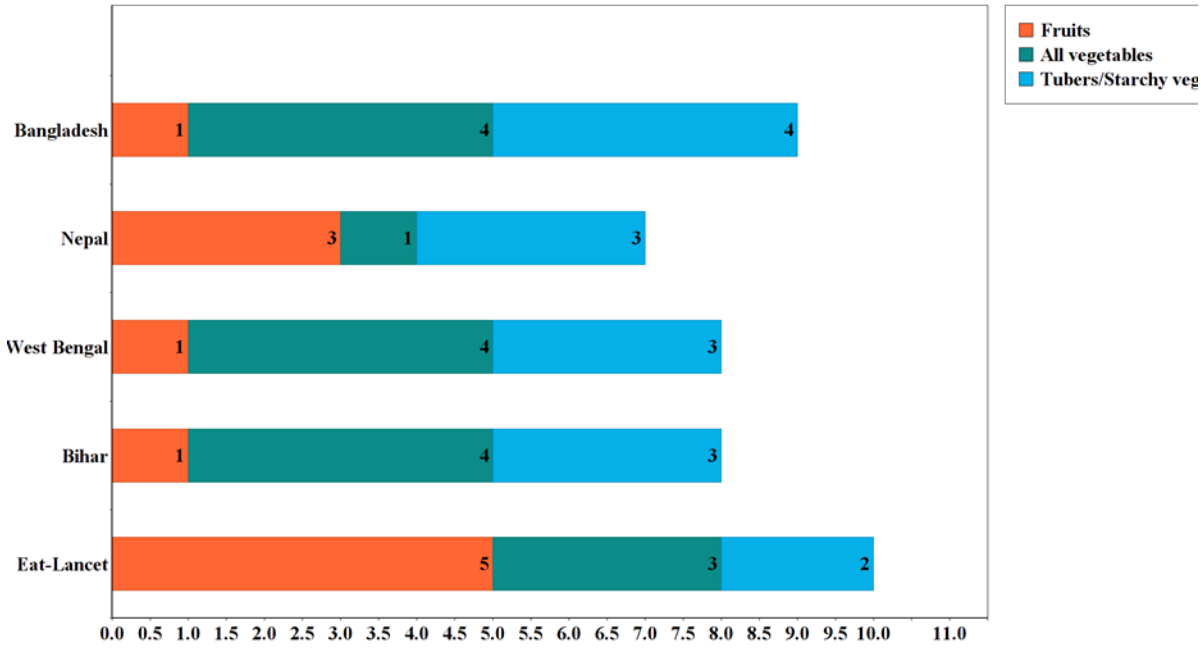

FIGURE 4 SHARE OF CALORIES (%) FROM FRUITS, TUBERS OR STARCHY VEGETABLES, AND OTHER VEGETABLES

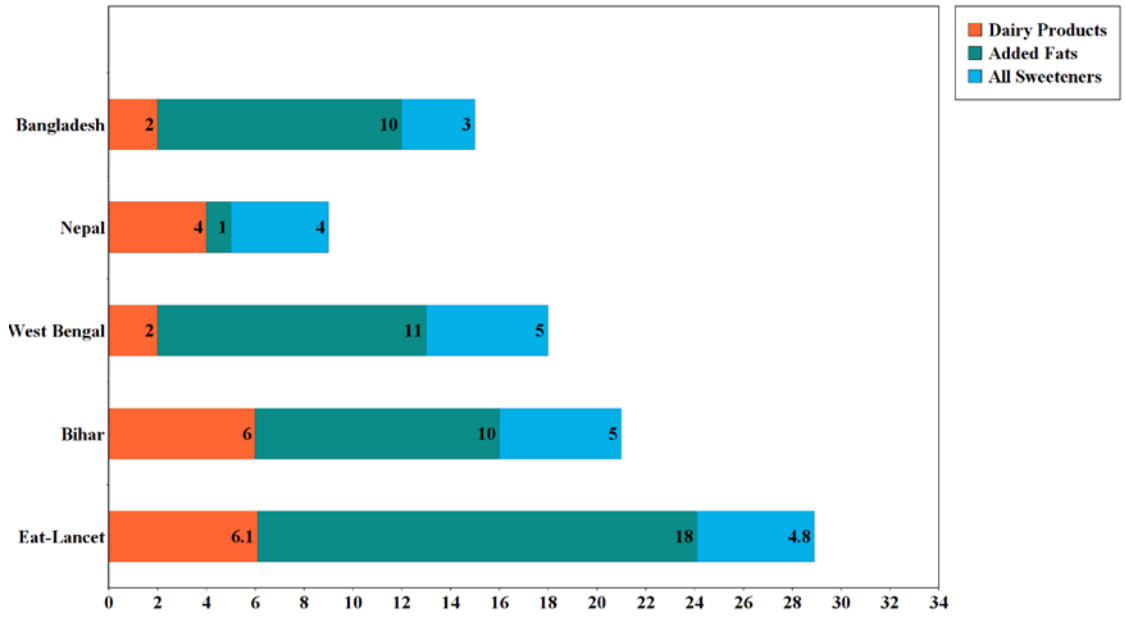

FIGURE 5 SHARE OF CALORIES (%) FROM DAIRY PRODUCTS, ADDED FATS, AND SWEETENERS

Whole Grains

EAT-Lancet recommends that nearly one-third (32.4%) of total calories in our daily diets should come from whole grains like rice, wheat, maize, millets, etc. However, the average food plate in all 4 regions of EGP has nearly double the recommended share of calories from whole grains. Furthermore, white rice, a big source of high glycemic index carbohydrates, with known negative health impacts (EAT Lancet, 2019) is the most widely consumed wholegrain in EGP.

In Nepal, wholegrains account for more than three-fourths of the daily average calorie intake (1833 kcal out of the total 2391 kcal). This is followed by Bangladesh (69%), West Bengal (67%) and Bihar (64%).

Plant and Non-plant based proteins

The EAT-Lancet commission recommends that 29% of our daily calorie requirement should be met by protein-rich diets. However, it recommends that non-plant protein sources should account for only 6% of the daily calorie consumption with negligible to zero consumption of red meat. Red meat has high environmental footprints and it is not good for human health. The International Agency for Research for Cancer classified red meat as a carcinogen. Many studies have shown that consumption of red meat is associated with higher mortality rates, type 2 diabetes, cardiovascular diseases and strokes (Eat Lancet 2019). EAT-Lancet suggests using poultry, fish, eggs, and dairy as the main sources of non-plant proteins. Unlike many other parts of the world, consumption of animal protein is quite low in the EGP region and the consumption of red meat is even lower. Animal proteins account for less than 1% of the average daily calorie consumption in Bihar and West Bengal, 2% in Nepal and 5% in Bangladesh.

While excessive consumption of animal protein is not an issue in the EGP region, low total protein intake is a major problem. Against the recommended 23% calorie share, protein-rich vegetarian foods like legumes, beans, and nuts account for only 2-5% of total average daily calorie intake in rural EGP.

Fruits and Vegetables

Fruits and vegetables are essential sources of dietary micronutrients. There is substantial evidence to indicate that consuming fruits and veg lowers risk of cardiovascular diseases, type 2 diabetes, and high blood pressure (Eat Lancet 2019). Intake of both tubers & starchy vegetables and other vegetables in EGP is close to (or more than) the recommended shares.

Fruits, however, are not a significant and common part of the daily diet in the region. Against the recommended share of 5%, an average household in Bihar, West Bengal and Bangladesh gets only 1% of the total daily calories from fruits. In Nepal, this share is higher at 3%.

Dairy Products

Dairy products are rich in calcium and may be beneficial for skeletal growth and bone health. All regions except Bihar (6%) have a lower consumption levels of dairy products than recommended (6.1%) by the

Eat-Lancet. However, the commission states in its report that an optimum amount of intake of dairy products remains uncertain due to lack of concrete evidence supporting its effects on health outcomes.

Added Fats

EAT-Lancet recommends 18% of energy intake from added fats with an emphasis on unsaturated plant oils. In comparison, the average calorie share from added fats is only around 10-11% across EGP. However, more than half of all added fats in the diets in EGP comes from palm oil which is high in unhealthy saturated fats and low in healthy polyunsaturated fats (PUFA). Palm oil is the largest food import of both India and Bangladesh and the second largest food import of Nepal (United Nations 2019). High and rising consumption of palm oil is bad for public health in EGP and it also contributes to deforestation and loss of biodiversity in the exporting countries like Indonesia and Malaysia.

Share of dairy fats, also high in unhealthy saturated fatty acids, is high too in the diets in the EGP region compared to what EAT-Lancet recommends while the share of vegetable oils have a lower than recommended.

Sweeteners

Added sweeteners have no nutritional value and their consumption is associated with adverse metabolic effects, weight gain, type 2 diabetes, and cardiovascular mortality. The average consumption of added sweeteners in rural areas Bangladesh, India, and Nepal, is close to their recommended share (5%) by EAT-Lancet. However, our accounting ignores sweeteners consumed in the form of purchased meals and packaged foods. We do not have reliable data on their consumption across the three countries.

Conclusion

This report compares the composition of rural diets in different parts of EGP with EAT-Lancet recommendations. We do not have food consumption data for urban areas of Bangladesh and in Bihar, West Bengal, and Nepal, the average urban diet is similar to the rural diet, but with slightly lower consumption of whole grains and higher consumption of processed foods.

Overall, there are broad similarities in diets across the region. Cereals, mainly rice and wheat, account for nearly double the recommended share of total calories. Among whole grains, consumption of coarse cereals like millets is low across the region. EGP is relatively poor even by the South Asian standards and cereal consumption is high in poor households across the world. High subsidies on rice and wheat through the public distribution system in India and active management of rice prices in Bangladesh and Nepal at low levels have also contributed to high share of rice and wheat calories in the diets in the region.

Intake of fruits and plant proteins is very low in all 4 parts of the EGP. The EGP region under-produces pulses, the most common vegetarian source protein in the diets here. Calories from fruits are significantly more expensive than the cereal calories and calories from processed foods resulting in

their low consumption (Headey and Alderman, 2019). The region has low consumption of added fats compared to the recommendations, but bulk of the fat comes from unhealthy palm oil. Palm oil is cheaper than the vegetable oils and cheap imported palm oil from east Asia crowds out their production and consumption in the EGP. EAT-Lancet recommends zero consumption of highly processed foods like salty and sugary snacks, but data from India shows rapid rise in their consumption across income classes. In India, the number of households that reported consuming unhealthy snacks in the 30 days before the survey far exceeded the number of households that had consumed some fruits. Rising consumption of unhealthy snacks is not only leading to a rise in consumption of sugar, salt, saturated fats, and highly processed flours but also crowding out the consumption of healthy foods like fruits and vegetables.

Despite broad similarities in the current dietary patterns across EGP, the pathways to healthier and environmentally sustainable diets may be different for the three countries. Each country needs both scientific analyses of data and stakeholder engagement to choose its preferred path to food system transition. Embracing the environment and the markets, more consistent and predictable trade policies, and financial and institutional support to smallholders to enable them to sustainably intensify agriculture to produce healthy food will be essential elements of any strategy for food systems transition in the EGP region.

Limitations

It is important to remember here that while we use average household-level consumption data, there are significant differences in consumption patterns across different incomes groups which our analysis does not account for. Furthermore, there can be large intra-household differences in diets of men and women, boys and girls in South Asia (Harris-fry et.al. 2017) with girls and women having poorer quality diet. Household-level consumption data that we use do not capture this important heterogeneity.

Lack of reliable information on the consumption of processed, packaged, and other forms of purchased foods is another major limitation of the data we have used in this report. Furthermore, the consumption survey in Bihar and West Bengal was done nearly a decade ago. Since then, India has implemented the National Food Security Act (NFSA) which provides more rice and wheat at higher subsidies to more households. Bihar has been the biggest beneficiary of this policy change among all states of India. Our data do not capture any dietary changes due to the NFSA. Finally, data from surveys carried out in different years in different countries with very different lists of food items included in the questionnaires also make interregional comparisons less accurate.

The global recommended diet gives us a good estimate of the proportions of food groups that should be consumed daily. However, studies show that the risk of obesity, type 2 diabetes, and coronary diseases are higher in Asians with a lower body-mass index as compared to other parts of the world (Weir and Jan 2019). Considering this, a daily calorific intake of 2503 kcal may not be appropriate for EGP. Nonetheless, we have to bear in mind that this is not a prescriptive diet, rather a ‘reference’ diet i.e. it gives us a direction to move towards the goal of sustainable and healthy diets.

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Foresight for Food Systems Status Reports

The Foresight for Food Systems in the Eastern Gangetic Plains (EGP) is a project led by IFPRI that seeks to lay down the groundwork for an open, scientifically informed and participatory foresight for food exercise in the EGP region led by regional scientists and engaging with other stakeholders like policy-makers, private investors, and farmers. A set of status reports on different components of the food system for better understanding of the current status, future challenges, research and knowledge gaps has been prepared for informed policy making for a sustainable future. The status reports will provide inputs into foresight and scenario building exercises in the region.

This work is funded by the Sustainable Development Investment Portfolio (SDIP), an Australian Government development strategy to increase water, food and energy security in South Asia to facilitate economic growth and improve livelihoods, targeting the poorest and most vulnerable, particularly women and girls.

SDIP initiatives aim to build technical capacity, share and generate knowledge, facilitate transboundary dialogue and mobilise the private sector and civil society in support of this objective. The focus area for SDIP initiatives is the three Himalayan river basins – the Indus, Ganges and Brahmaputra – which cover parts of India, Pakistan, Bhutan, Nepal and Bangladesh.

SDIP is a 12-year strategy (2012-2024), recognising that many of the critical interventions required for improving the integrated management of water, food and energy at the river basin level require sustained engagement to build regional cooperation and capacity over time. The Australian Centre for International Agricultural Research (ACIAR) is one of seven partners in SDIP. ACIAR SDIP funds research and development activities that improve agriculture's contribution to sustainable food systems. For further information on the project please visit https://aciarsdip.com/component-2