



Federal Ministry
of Food
and Agriculture

Call for Proposals No 11/19/32 „Food environments for improved nutrition“

NutriAIDE – Building smart food environments for improved nutrition

country/countries	Germany / India
funding agency	Federal Ministry of Food and Agriculture - BMEL
project management	Federal Office for Agriculture and Food – BLE
project coordinator	Augsburg University, Prof. Dr. Markus Keck
project partner(s)	German Institute of Human Nutrition Potsdam-Rehbrücke Wuppertal Institute for Climate, Environment, Energy gGmbH ICMR-National Institute of Nutrition, India Calvry Wellness Solutions Ltd.
project budget	1,393,708.81 €
project duration	1 July 2021 – 28 February 2025

key words	Obesity, app development, digitalization, nutrition, nutrition literacy, food practices, food environments, artisanry, malnutrition, sustainable development, public health, ecological footprint, transdisciplinarity, transformation, transformative science
background	<p>With the Sustainable Development Goals, the UN member states committed themselves to “ensure access by all people [...] to safe, nutritious and sufficient food all year round” (Target 2.1) and to “end all forms of malnutrition” (Target 2.2). Yet, after decades of steady decline, the trend in world hunger and undernourishment reverted in 2015 and has even increased slowly in the past three years. At the same time, economic development, demographic transition, and urbanization have led a substantial change in food preferences with an increased demand for processed convenience and fast-food high in sugar, salt and fat (GBD 2019). This trend has ended in an epidemiological transition from a high prevalence of infectious diseases to alarming levels of non-communicable diseases (NCDs) and from high percentages of wasting and stunting to unprecedented cases of obesity. Today, more than 820 million people worldwide suffer from hunger (FAO et al. 2019), while 1.9 billion adults are overweight, and 650 million people are obese (WHO 2018).</p> <p>The global obesity epidemic reveals certain epicenters: More than 50 percent of the world’s obese live in only ten countries, i.e. United States of America, China, India, the Russian Federation, Brazil, Mexico, Egypt, Germany, Pakistan, and Indonesia (GBD 2014). As this list shows, overweight and obesity are features not only of High-Income Countries, but predominantly of Low- and Middle-Income Countries, where they are found mainly in urban areas (HLPE 2017). Against this background, it is disturbing that, to date, no country or sub-population within a country has reversed its obesity epidemic, representing one of the biggest public health challenges of our time (Roberto et al. 2015). Given the advanced status of current trends, superficial repairs to the existing food system will no longer suffice. As José Graziano da Silva, former Director-General of the Food and Agriculture Organization of the United Nations (FAO), wrote: “transformative changes in agriculture and food systems are required worldwide” (FAO 2017).</p> <p>The aim of this project is to help pave way for transforming the global food system by demonstrating a viable experiment with special emphasis on India – a sub-continent in itself - with a population size of more than 1.3 billion.</p> <p>India today faces the so-called double burden of malnutrition, characterized by the persistence of undernutrition coupled with rising rates of overweight and obesity (WHO 2017). This double burden is the outcome of the country’s globalized food system. Food system is often defined as “all the elements (environment, people, inputs, processes, infrastructures, institutions, etc.) and activities that relate to the production, processing, distribution, preparation and consumption of food, and the output of these activities, including socio-</p>

	<p>economic and environmental outcomes” (HLPE 2014). At the same time, malnutrition is also related to people’s food environments – a notion, which refers to the physical, economic, political, and socio-cultural contexts in which consumers engage with the food system to make their decisions about acquiring, preparing and consuming food (HLPE 2017).</p> <p>Food environments include wet markets, supermarkets, corner stores, street stalls, vending machines, restaurants, canteens, etc. – in short, all those places, where people purchase or obtain food (Caspi et al. 2012). Food environments consist of specific physical spaces with their built features and infrastructure, as well as of personal determinants of consumer food choices (including income, education, skills, norms, and values, etc.) and surrounding political and cultural institutions that underlie these interactions (Herforth & Ahmed 2015). Food environments comprise the everyday prompts which nudge consumers’ food choices in particular directions (so-called “choice architecture”, Hawkes et al. 2015) thus contributing to dietary routines that can have long-term negative health impacts (FAO 2016). Therefore, they are central “interfaces” between the superordinate food system on the one hand and individual diets on the other.</p>
objective	<p>In this project, we follow Hawkes et al. (2015) and take food environments as starting point for food system transformation. The authors (ibid.) identify four mechanisms through which nutrition-related interventions can be expected to work in this regard: (i) by encouraging people to reassess their personal unhealthy preferences and eating habits; (ii) by providing enabling information for healthy preference learning; (iii) by overcoming barriers to the expression of healthy preferences in people’s personal food environments; (iv) and by stimulating positive food system responses by concrete dietary change and food environment transformation.</p> <p>By following the general remarks of Hawkes et al. (ibid.), in this project we examine the dietary behavior, nutrition-related decision making and self-quantification of overweight and obese middle-class consumers in urban India and develop an app-based solution for transforming their respective food environments. This app serves consumers (i) to measure, assess, and change their personal eating routines in different social settings (e.g. grocery shopping, out-of-home catering); and (ii) to collectively transform their socially shared food environments in the sense that healthy diets are promoted, local artisanal food producers are empowered, and environmental protection is fostered.</p> <p>The guiding questions of the project are:</p> <ol style="list-style-type: none">1. How are urban food environments and obesity in adulthood related to each other in India?

	<p>2. To what extent can urban obesogenic food environments in India be transformed with the help of an app designed for this purpose?</p> <p>3. To what extent can the Indian obesity epidemic be curtailed through an app-based transformation of urban food environments?</p> <p>4. How does the transformation of obesogenic food environments affect corresponding urban food systems in India?</p>
<p>short description</p>	<p>In this project, we investigate food practices and nutrition-related decision-making, the ecological footprints as well as their involved social and economic effects of different typical products and their commodity chains, and the advantages and disadvantages of self-quantification among overweight and obese urban middle-class consumers in India. By bringing together results from Nutrition (ICMR-National Institute of Nutrition, India), Geography (Augsburg University), Neuropsychology (German Institute of Human Nutrition Potsdam-Rehbrücke) and Sustainability Science (Wuppertal Institute for Climate, Environment, Energy gGmbH) we design and test an application software (app) called NutriAIDE together with the private software developer Calvry Wellness Solutions Ltd. and then put it into operation. With the help of the app, consumers are enabled to change their unhealthy dietary patterns, characterized by a high demand for industrially processed foods and the associated intake of high levels of sugar, salt and fat, in favor of the consumption of nutritious, locally produced, less processed and predominantly plant-based foods. The app serves consumers to measure and change their personal food practices in different social contexts.</p> <p>The overall project is divided into four phases:</p> <p>In the first phase, the researchers familiarize themselves with the specific local conditions of the study areas and test the various methods for data collection that will be used in the further course of the overall project. With the help of site visits, suitable districts and neighborhoods are selected for the research in the two study regions of Hyderabad and Delhi. Particular attention is paid to the user-friendliness and costs of the survey methods, as well as to the quality of the results.</p> <p>In the second phase, data on the initial situation will be collected in the previously selected districts and neighborhoods. The conducted surveys focus on the food practices of the study participants, their nutrition-related decision-making, and the characteristics of their respective food environments. A total of 720 people will be interviewed in both study regions together, with 360 people as part of an experimental group and 360 people as part of a control group. All participants in the study must be at least 18 years old, have prior knowledge of using apps, have access to an Android smartphone, appear to be healthy, and have a body mass index of at least 25.</p> <p>Based on the research results obtained in the first two phases, the “NutriAIDE” app will be developed in the third phase with the involvement of the</p>

study participants and handed over to the people in the experimental group. The app serves as a tool for users to record their personal eating habits, access nutrition-related information and get in touch with one another. At the same time, it allows to enter the location of retailers in the urban area into an interactive map, to evaluate their food offerings by using a predefined multidimensional scheme, and thus to create incentives for the transformation of the respective food environment. The people in the control group are not provided with the NutriAIDE app.

The fourth and last phase serves to examine and evaluate the transformations achieved through the use of the NutriAIDE app. Particular attention is paid to changes in the diet of the study participants, their health status, their respective food environments, as well as economic and ecological impacts. The results of the experimental group are compared with those of the control group to be able to make generalizable statements about the benefits of the NutriAIDE app and about the opportunities and limits of the transformation of individual food practices, socially shared food environments and the overarching food system.

The NutriAIDE app is the central outcome of the project. The application will be published as part of the project and will be available to all Indian users free of charge after the end of the project. The software company Calvry Wellness Solutions Ltd. will take over the provision of server capacities and the technical support of the app, so that it can grow in content and become part of the Indian social media landscape in the following years.

From a scientific vantage point, the project allows an interdisciplinary analysis of the relationship between urban food environments, everyday food practices and the health status of overweight and obese consumers in India (Marwa et al. 2019). The data collected extend existing datasets on human nutrition and its ecological footprint (Lukas et al. 2016) and contribute to a better understanding of the local drivers of the global obesity epidemic (Jaacks et al. 2019). Finally, the results allow to draw conclusions about causal links between dietary patterns on the one hand and human decision-making on the other (Strang et al. 2017).