



## Project Update

<b>Projekttitle (Akronym):</b>	<b>NutriAIDE – Building smart food environments for improved nutrition</b>
Country/region/city	Indien / Hyderabad
Call title	No. 11/19/32 “Food environments for improved nutrition”
Cooperation partners	Augsburg University, Chair for Urban Climate Resilience German Institute of Human Nutrition Potsdam-Rehbruecke Wuppertal Institute for Climate, Environment, Energy gGmbH ICMR-National Institute of Nutrition, India Calvry Wellness Solutions Ltd
Project duration	1 July 2021 – 28 February 2025
Budget	1.393.708,81 EUR

### Goal and Objectives

The rapid digitalisation and proliferation of the mobile internet have been pivotal in the transformation of contemporary food environments, as evidenced by current observations. The digitalisation process in India has been considerably more rapid than in Europe. Furthermore, this was accompanied by the advent of smartphones and Web 2.0. Consequently, the Indian population was socialised to digital technologies in a manner that differed from the experience of European societies. The advent of Web 2.0 marked a significant shift from the original iteration of the internet, where a small group of professionals (companies, governments, NGOs, etc.) dominated content creation. In Web 2.0, users have become the primary creators and sharers of content, particularly on social media platforms like YouTube and Instagram. In contrast to the Web 1.0, which was primarily constituted by websites, the Web 2.0 is founded upon the existence of applications (known as apps). Given the pervasive integration of these apps into everyday life through their use on smartphones, the digitalisation of the food environment could also be integrated more rapidly and comprehensively into everyday life. This process was facilitated by a number of additional factors, including the introduction of Western-style supermarkets from the early 2000s, the abolition of the 500 and 1,000 rupee notes in 2016, and the impact of the 2020 pandemic, which included lockdowns and other restrictions (see last year's report).

Since the 2000s, the advent of packaged and industrially processed products in the increasingly widespread supermarkets has significantly altered perceptions of fresh and hygienic food in India, particularly in urban areas. Furthermore, the abolition of the smaller banknotes, which are most commonly used in everyday life, has significantly accelerated the use of mobile payments. Furthermore, the lockdowns imposed in response to the global pandemic have led to a significant



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increase in the utilisation of online delivery services, both for grocery shopping and for ready-to-eat meals. These factors have resulted in significant alterations to the foodscapes, particularly among the younger, urban middle class. This has had adverse effects on urban health and the ecological footprint of India's food system (see project proposal).

In this context, the primary objective of this project is to conduct a field experiment. The initial phase of the project will entail an investigation of the diverse food environments that characterise the Indian middle class. This is accompanied by research into the processes by which decisions are made and their subsequent health, socio-economic and ecological consequences. In a second step, the team is developing an application software (app) called NutriAIDE in collaboration with the private software developer Calvry Wellness Solutions Ltd. The app is being designed to combine the results of nutritional science (ICMR-National Institute of Nutrition, India), geography (University of Augsburg), neuropsychology (German Institute of Human Nutrition Potsdam-Rehbrücke) and sustainability research (Wuppertal Institute for Climate, Environment, Energy gGmbH). It will be distributed to a test group of subjects. The app enables consumers to monitor and evaluate their dietary patterns, facilitating the adoption of healthier and more environment-friendly eating habits. In the third phase of the study, the team will assess whether the app has led to a reduction in the consumption of processed and fast food among the test population, as well as an increase in the demand for unprocessed, more ecologically sustainable products and a diversified diet.

The results of the intervention are quantified by means of a comparison between the behaviour of the test population and that of a similarly structured comparison group. The actual experiment, which is conducted on an interdisciplinary basis and includes comprehensive investigations, as well as an intervention (the distribution of the app to test subjects), is currently being carried out in Hyderabad. Subsequently, an additional experiment will be conducted online, comprising a survey and intervention, with the objective of comparing the locally generated results in the context of the entire Indian population.

## Results

In the second year of the project, a baseline study was conducted. This study is conducted prior to the intervention (distribution of the app) with the objective of gathering socio-economic and anthropometric data, as well as the participants' current dietary habits. Subsequently, the intervention was implemented. In this study, the app developed as part of the project was made available to the test subjects. Following the conclusion of the intervention, the test subjects were finally interviewed once more. The process commenced in the second year of the project but was not concluded until the beginning of the third year. Nevertheless, the baseline study yielded a substantial amount of insight.

A total of 720 subjects were examined as part of the baseline study. The subjects were drawn from the middle class of Hyderabad and were divided into an experimental group and a control group. The experimental group was provided with the NutriAIDE app, which offers a range of functions (e.g., a digital food diary, the proportions of food consumed broken down by food groups, and the CO<sub>2e</sub> footprint for food consumed). In contrast, the control group was given a brochure on the Planetary Health Diet instead of the app. This study design enabled the effects of the app to be evaluated in comparison to conventional intervention measures. The subjects were interviewed



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at their place of residence, and anthropometric measurements (height, weight, hip and waist circumference) were also taken. These were employed to calculate the body mass index (BMI) and waist-to-hip ratio (WHR), with a view to determining whether the subjects were underweight, of normal weight, or overweight. The questionnaire was developed in collaboration with all project partners. Furthermore, the questionnaire encompassed socio-economic data, along with respondents' purchasing and dietary habits, as well as their attitudes towards healthy and sustainable food. Furthermore, respondents were queried about their attitudes towards digitalisation, including their use of digital applications, their perceptions of their own corporality, and the influence of significant social and personal events on their dietary habits. Subsequently, psychological tests were conducted to ascertain their motivation with respect to nutrition and their psychological state.

As previously stated, India's accelerated digitalisation is exerting a considerable influence on the food environments of urban Indians, which are currently undergoing substantial transformation. It is therefore of great societal importance to ascertain whether these novel digital food environments will have a beneficial or detrimental impact on the nutritional status of the Indian population, particularly the urban middle class. In light of the aforementioned considerations, the initial results pertaining to the impact of digitalisation on the dietary habits of the subjects are presented here as an illustrative example.

The 720 subjects were asked as to what they hoped to gain from the utilisation of apps pertaining to nutrition and health. The three most frequently cited responses were "improving health," "acquiring health knowledge," and "gaining nutrition knowledge." Furthermore, the subjects were asked as to the actual impact of the advent of online grocery shopping platforms and online delivery services on their shopping and eating habits. The subjects were asked to indicate whether their diet had become healthier, remained equally healthy, or had become less healthy since the introduction of digital food environments. This type of survey is adapted from biographical research. This approach is predicated on the assumption that specific life events exert a particularly strong influence on behavioural change. The survey allows for the formulation of statements regarding the potency and direction of effect (positive or negative) of an event. The greater the number of subjects who report a change in their diet following an event within the context of the survey, the more significant the event is within this context. Furthermore, it is possible to ascertain whether the event had a positive (diet became healthier) or negative (diet became less healthy) overall impact by comparing the proportions of the direction of change. In the event that either of the two possibilities accounts for more than 50%, it can be described as the dominant direction.

The advent of online food delivery services and the option to purchase food online have had a significant impact on the urban middle class of Hyderabad. For instance, 46% of respondents indicated that they had observed a change in their healthy eating habits since using online delivery services. The option to purchase food online has resulted in a change in dietary habits for 38% of respondents. Of the subjects who experienced a change due to online delivery services, a significant 70% stated that they had adopted a less healthy diet since then. It can thus be concluded that this event is, on the whole, negative. In contrast, 57% of respondents who had the option of purchasing food online indicated that they had adopted a healthier diet since then. This example demonstrates that the recently emerged digital food environments have both positive and negative effects on the nutritional practices of the urban middle class in India. This is further empha-



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sised by the qualitative results of the preliminary study and expanded upon with quantitative results. It is noteworthy that the expectations of app users are focused on an enhancement in the quality of information pertaining to healthy eating. Nevertheless, the reality that the food practices conveyed via food apps only result in a tangible shift towards a healthier and more sustainable diet in a negligible proportion of cases is at odds with this assertion.

### **Key messages and policy advice**

The rapid digitalisation of India has not spared the food environments in urban India, but has rather led to significant changes. The digital transformation has been accelerated by the advent of the pandemic and the associated lockdowns. The results of the baseline study of the project demonstrate that the digitalisation of urban food environments is having contradictory effects. Although users of food apps anticipate a more comprehensive range of information on healthy eating, it is noteworthy that 70% of individuals who have altered their dietary habits due to the advent of online food delivery services report a decline in their dietary quality since then. The NutriAIDE app, developed as part of the project, is therefore of particular importance, as it represents a counterproposal to the apps currently available on the Indian market. The app is not populated with information from food companies or other users who may lack the requisite knowledge, but rather draws on scientific evidence, thereby offering a reliable source of information on healthy and sustainable diets. It is to be hoped that the app will continue to be distributed even after the project has ended and will be able to establish itself in the highly competitive market of nutrition and health apps.