

# Exploring the Interaction between the built food environment and intra- household gastronomy through photovoice in India

Research Note 22, December 2023

## BACKGROUND

Growing attention to food environment policies has been observed to address the multiple aspects of malnutrition (Kumar et al. 2023). In India, interventions promoting sustainable agriculture, small-scale farming, and equitable access to markets have been initiated to address the food and nutrition security of economically vulnerable groups. However, transformative interventions require deeper understanding specific contexts and a deep knowledge of the food environment. Moreover, simply improving food availability and access does not necessarily lead to better nor more equitable nutrition outcomes. Understanding the systemic cultural drivers of food choice, interventions promoting sustainable dietary choices can be more effectively contextualized leading to improved nutritional status.

In this research note, we have adapted an expanded definition of the food environment using the socio-ecological framework (Downs et al., 2020) and the Gastronomic Systems Research (GSR) framework (Cuevas et al., 2017; Samaddar et al., 2020; Custodio et al.,

2021). These frameworks allowed us to characterize the structures and processes in which individuals directly interact with the built food environment and the range of cultural factors influencing food choice for low- to middle-income households. By employing Photovoice, a participatory and visual methodology that offers an emic approach by placing cameras in the hands of individuals facing socio-economic disadvantage and/or marginalization (Pradeilles et al., 2021), we captured consumers' experiences to identify the factors from the food environment that shape low-income households' purchase of food, in general, and of healthier food options, in particular. Findings from this study could provide evidence for understanding consumption behaviors and associated factors, thereby providing insights into developing nutrition-sensitive interventions to improve the food environment that promotes healthy diets in low-income households. We examine the case of Bihar in India as it is considered one of the more malnourished states in India where the affordability of a healthy diet is a significant concern, with more than

half of its population being impoverished and/or undernourished (NITI Aayog, 2021).

## OBJECTIVES

The main objective of this study was to explore the interaction between the built food environment and intra-household gastronomy to understand the food purchase and consumption behaviors of low-income households. Specifically, we sought to (1) contextualize the different elements of the built food environment of the target population, (2) explore intra-household gastronomy and consumption behavior, and (3) investigate the association between food environment and intra-household gastronomy.

## DATA AND METHODS

Research was implemented in Nalanda district, Bihar from November to December 2022. Nine low-income farming households were purposively selected based on multidimensional poverty indicators (i.e., nutrition, education and standard of living) and geospatial habitat clustering, considering road and market density. A male and female member involved in food-related activities from each household were invited to participate. Photovoice data collection involved three steps: 1) Engaging and training participants to use tablets for photography, 2) organizing photo collages reflecting built food environments and intra-household gastronomy, and 3) conducting exploratory interviews to understand participants' perspectives on the photos, the reasons behind them, and the decision-making process for household food purchases (Fig 1).

The narratives elicited during the interviews participants were transcribed and coded for content analysis using NVIVO 12. The frequencies of co-occurrence of emerging food environment themes were computed and visualized through network maps. Insight into intra-household gastronomy was analyzed based on the number of identified food groups from dishes prepared at home at the occasion-, dish-, and ingredient-level. Content analysis further identified pathways for food purchase decisions, encompassing both the food environment and the household's gastronomic system.

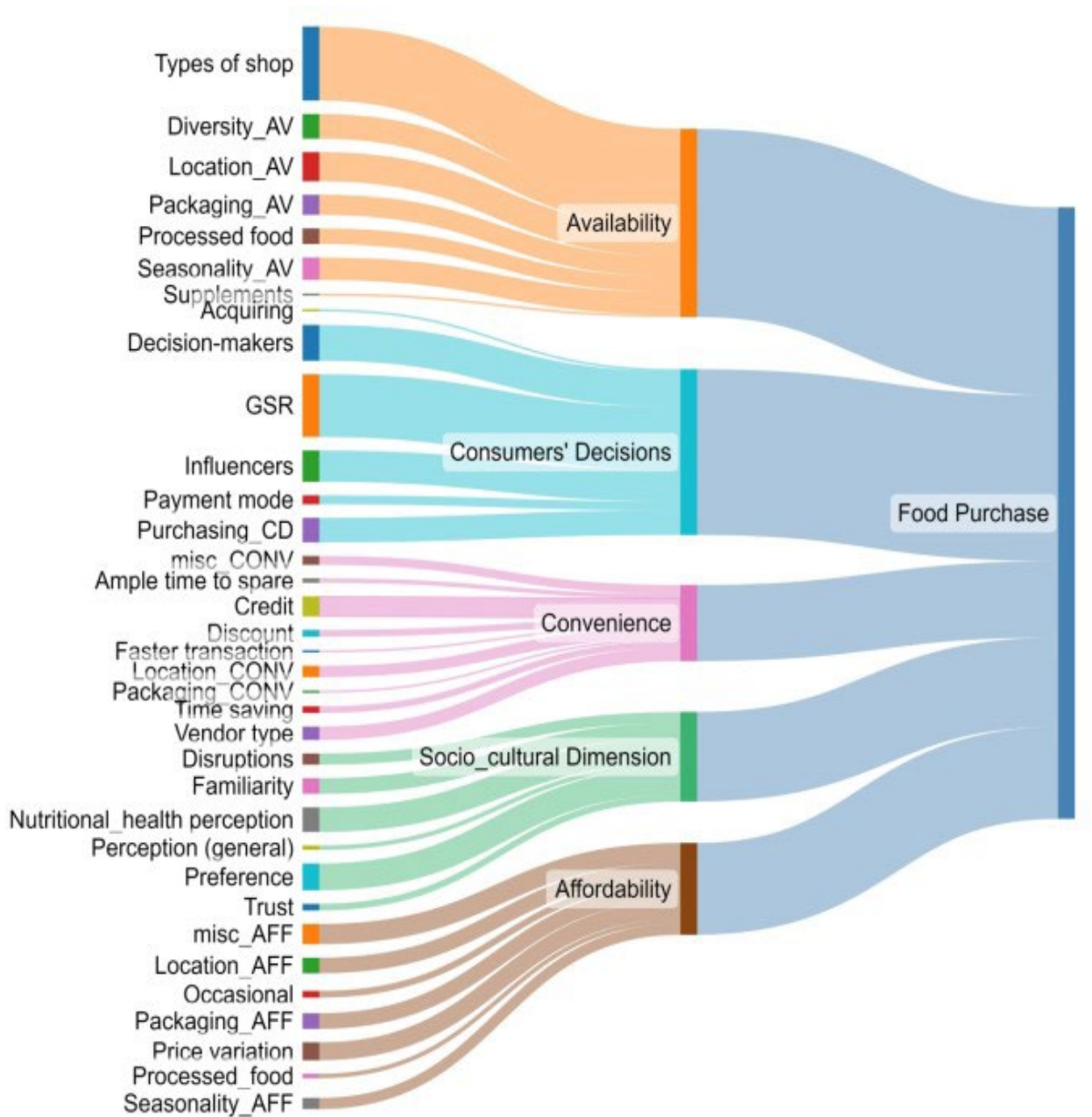


**Fig 1.** Photovoice's three-step data collection process used in this study. Photo Credits: S.Swain/J.Ynion)

## PRELIMINARY FINDINGS

### Built Food Environment

Results from the content analysis revealed five emerging themes that consumers consider in their interaction with the built food environment: (1) availability of food, (2) consumer decisions, (3) sociocultural dimensions, (4) affordability of food, and (5) convenience (Fig 2).

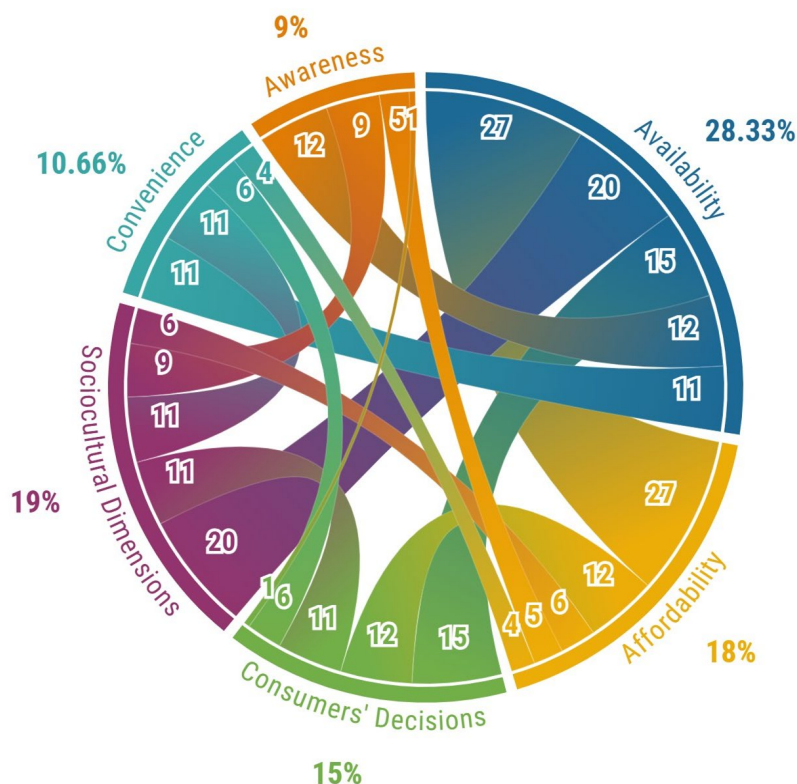


**Fig 2.** Contribution of the major themes and sub-themes to food purchase decisions. The diagram represents the five major themes and subthemes contributing to the food purchase decision of the low-income farming households in Nalanda, Bihar. The breadth of each flow represents the contribution of each code in their respective themes.

Availability examines the abundance and variety of food options considering product variety, locational and seasonal stock (e.g., cauliflower is only available in large vegetable markets and in local markets (*mandis*) during the summer), market proximity, shop similarity (e.g., across different markets and types of retail market). Consumers' food purchase decisions and consumption behaviors are associated with family dynamics, food preferences of household members, and retail's available payment methods. Food purchase appears to be a complex decision-making process based on the households' gastronomy (e.g., the specific dishes they prepare for specific occasions, the ingredients they need for these dishes), eating habits, and ingredient sources. Our

study findings reveal that socio-cultural dimensions play a crucial role in (1) how consumers perceive the nutritional value and health benefits of food, (2) their interpersonal relationships with retailers, and (3) their perceptions towards brands. The "affordability" theme captures consumers' willingness to pay for various food items and the associated costs in purchasing the food items. The "convenience" themes reveals the importance of (1) considering the perceived benefits of packaged food, (2) accessibility of different products at different places and time, and (3) social dynamics in acquiring credit.

Figure 3 displays the interconnections of the five themes exploring their relationship with each other.



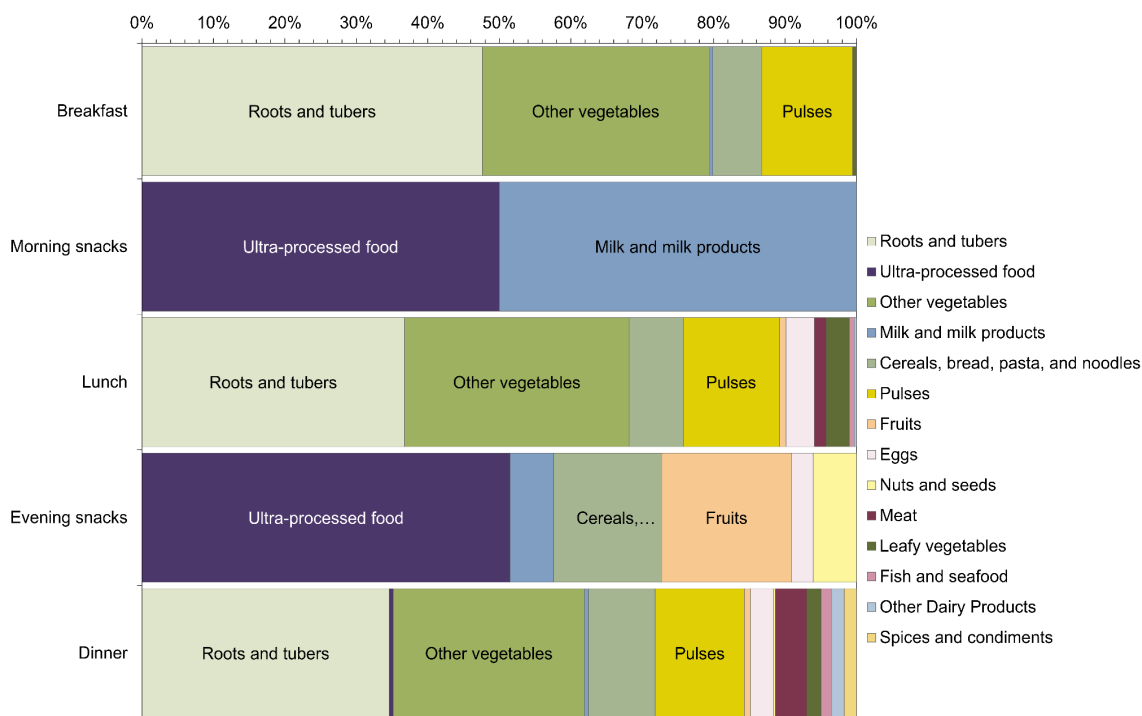
**Fig 3.** Contribution of the major themes and sub-themes to food purchase decisions Note: The diagram represents the five major themes and subthemes contributing to the food purchase decision of the low-income farming households in Nalanda, Bihar. The breadth of each flow represents the contribution of each code in their respective themes.

## Intra-household Gastronomy

Figure 4 depicts the diversity of food groups across different eating occasions. Households typically consume food during breakfast, lunch, and dinner while morning and evening snacks are infrequent, and mostly children consume food. Dinner is found to have the most diversity where households consume various dishes classified into food groups. Across eating occasions, households mostly consume starch-based (i.e., dishes paired with rice, chapatti, or bread) and vegetable-based dishes. Common ingredients such as mustard oil and locally available raw spices are used in preparing dishes. Dishes for special occasions are made with more ingredients (e.g., hot spice blend, additional mustard oil, meat masala, and tomato) while curry-based dishes, a commonly consumed dish, are made

special by keeping it more dry than usual.

Each household member plays a distinct role in relation to the household's gastronomy. The female member decides on the dish to prepare and consume at home while the male member buys the ingredients and consequently decides when and where to purchase them. Dishes are influenced by the elders and the preferences of children or specific household members. Moreover, households typically prepare food two times a day—in the morning which is served for breakfast and lunch, and in the evening served for dinner. This behavior reflects the daily activities that household members are engaged with. These findings underscore the importance of food availability and accessibility on household's purchasing and consumption behavior.



**Figure 4.** Diversity of food groups consumed by households across different eating occasions. The bar chart represents the frequency of cooked dishes and bought food items in each eating occasion. The cooked dishes and food items were classified into different food groups based on their main ingredient.

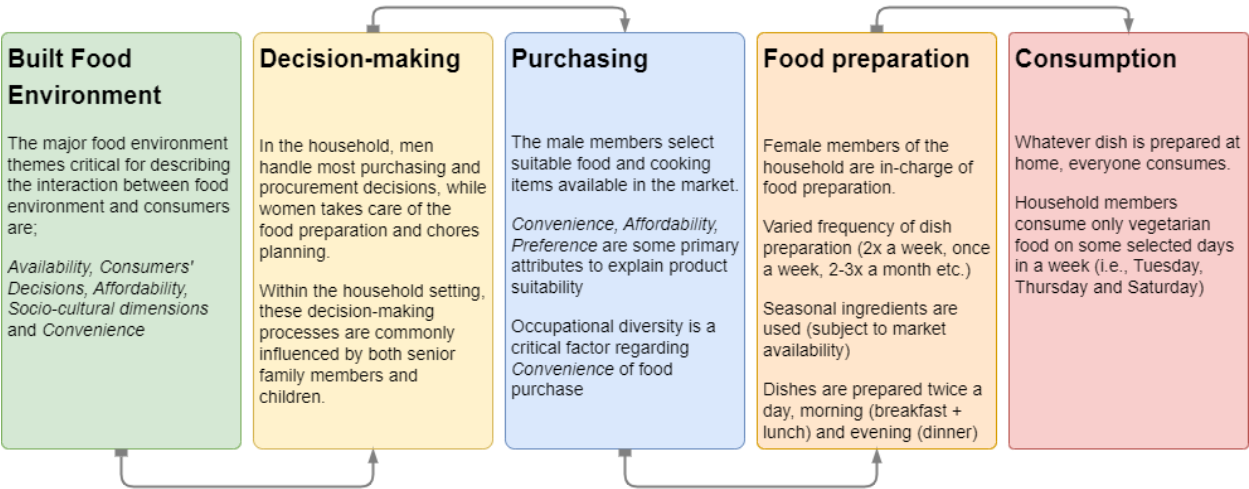


Where the food environment meets consumers' decisions

The five key themes of the built food environment that emerged influence the decision-making of male and female household members regarding their food purchasing behavior (Fig 5). These include food availability in the market and at home, affordability, and convenience in purchasing food items that the household prefers to consume. Our data on the decision-making process suggests that male members are mainly engaged in purchasing day-to-day food items/ingredients to be cooked in the household, while female members are mainly engaged in food preparation and suggest the food and ingredients that are required to meet the family's demands and preferences. It is noteworthy that this dynamic illustrates the different dimensions of the food environment (i.e., availability, convenience, preference, and consumers' food choices and purchasing decisions).

PRELIMINARY CONCLUSIONS

Nutrition-sensitive interventions need a deeper understanding of the food environment and how consumers' food purchase and consumption decisions influence their diets. The food environment plays a crucial role in the development of nutrition interventions as it encompasses the full range of options within which consumers make decisions about what foods they acquire and consume (Downs et al., 2020). However, the success of nutrition interventions ultimately depends on understanding consumers' food choices, which are influenced by interrelated factors such as their nutritional needs, their socio-cultural context, their hedonic motivations, and their attitudes and beliefs towards food (Castellini et al., 2023; Cuevas et al., 2017; Karanja et al., 2022). In this research brief, we explored how consumers interact with the food environment and how this interaction influences the gastronomic systems of low-income farming households.



**Figure 5.** A thematic diagram showing the interaction of built food environment and intra-household gastronomy. Authors' representation.

Thematic analysis revealed five emerging food environment themes that influence food purchase and food consumption: (1) availability, (2) consumers' decisions, (3) sociocultural dimensions, (4) affordability, and (5) convenience, where availability and affordability were observed to be closely associated. Intra-household dynamics provided insights into the distinct gender roles and levels of influence of male and female household members. Female household members optimize the available ingredients to prepare the best possible dish appropriate for

different eating occasions. The purchasing behavior of male household members is influenced by the availability of food and their household's perception of the health benefits. The good purchase decision-making process from both male and female members illustrated how the food environment influences intra-household gastronomy. These insights related to the different food environment themes and gastronomic systems are important to consider in the design and implementation of nutrition-sensitive interventions.

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TAFSSA (Transforming Agrifood Systems in South Asia) is a CGIAR Regional Integrated Initiative that supports actions improving equitable access to sustainable healthy diets, that boosts farmers' livelihoods and resilience, and that conserves land, air, and water resources in a climate crisis.

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