NOTES

Food Environment and digital technologies, tools for the sustainable transformation of food systems in the Mediterranean

ROBERTO CAPONE
Principal Administrator CIHEAM Bari
Focal Point CIHEAM Sustainable Food Systems

SANDRO DERNINI
Senior Advisor, CIHEAM Bari

TEODORO MIANO
CIHEAM Secretary General

The transformation towards sustainable food systems[1], an increasingly debated topic at international level, presents multiple challenges related to the different types of agri-food systems[2] existing on our planet that denounce the complexity in the design of policies and interventions at different levels. To achieve greater sustainability and healthiness of the different types of agri-food systems, it is also very important to consider them in their entirety, accepting the close interrelationship, so far little considered, between consumption and production and, at the same time, to analyse the different elements of agri-food systems on which to act.

Among these, the one that is receiving more and more attention in the field of food policies is represented by the *Food Environment* which, in the definition of the High Level Panel Expert of the United Nations Committee on Food Security, refers to the "...physical, economic, political and sociocultural context in which consumers interact with the food system to make their decisions regarding the acquisition, preparation and consumption of food" (HLPE, 2017).

[1] Sustainable agrifood system is a food system that guarantees food and nutritional security for all so that the economic, social and environmental foundations for generating food and nutritional security for future generations are not compromised. Source: HLPE (2014).

[2] In the 2017 HLPE Report, three broad types of food systems are identified, to simplify: (i) traditional food systems; (ii) mixed food systems; and (iii) modern food systems.

In recent decades, emphasis has been placed on the responsibility of consumers' choices based on the idea that raising their awareness and greater food education could influence their eating behaviors by placing many responsibilities on citizens by expecting them to make the right food choices in environmental, social or ethical terms, based on simple information campaigns aimed at adopting sustainable lifestyles.

In daily life, however, food choices are not based on available information but are linked to physical, economic, political, social and cultural factors, most of which are suffered by consumers. The combination of these factors represents the food environment, i.e., the interface between the Food Supply Chain and the consumer, within which people make their food-related choices.

The implications towards the transformation of agri-food systems based on the creation of sustainable food environments today represents a strategic approach for the transformation of agri-food systems. *It is based on the belief that our food choices and their consequent impact are guided, not by the consumer, but by the contexts in which they are taken.*

Therefore, for the sustainable transformation of the food environment it is necessary to act on those elements of a social, economic, commercial, technological nature, as well as of a strategic-political nature, which can put consumers in a position to practice sustainable[3] and healthy diets (such as, for example, the Mediterranean Diet).

The food environment is not only fundamental for shaping people's food choices, but it takes on strategic importance because, by mediating between the needs of consumers and those of producers, it translates food demand patterns into production methods by communicating, for example, which production method to adopt (e.g., organic farming) which type of product is required (AOP, Traditional Products, Terroir, IGP, DOC, etc.) and what the right selling price might be.

In turn, food production shapes the food environment as it determines the availability of food and its characteristics related to the impact on natural resources and climate change, social and cultural aspects, human health and animal welfare.

Unfortunately, today the situation does not correspond to that described as food environments do not favor sustainable food choices and the transformation of this negative trend requires decisive interventions to make food environments favorable to the adoption of healthy and sustainable diets.

In this perspective, it is essential to encourage the desirability of sustainable agri-food products, creating new and better needs for the consumer.

Creating sustainable food environments means ensuring that foods and beverages that contribute to healthy and sustainable diets are the most available, physically and affordably accessible, attractive, widely publicized and popular.

In such environments, not only must the healthiest and most sustainable choices be as natural as possible, but the availability and promotion of foods and beverages on which unhealthy and unsustainable diets are based are at the lowest levels.

[3] Sustainable diets are those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy while optimizing natural and human resources. Source: Bioversity international and FAO, 2010.

In addition, a consumer ethics is needed that links individual choices to the well-being of the community. This ethics cannot be imposed from above, but must leverage the cultural resources existing in each territory. Cultural dietary models such as the Mediterranean Diet can facilitate the transformation towards sustainable consumption, associating the need for change with cultural identity (Brunori, 2022).

Numerous policies and programs aimed at making the food environment sustainable have been implemented worldwide, although most of those investigated in the literature have focused on high-income countries and less on low- and middle-income countries.

Most of these measures, which should always be accompanied by social, economic and infrastructural policies to ensure that individuals can enjoy sustainable food environments and the possibility for producers to participate in them, have focused on the availability of and physical and economic access to food, on the promotion, advertising and information of food, and on the quality and safety of food.

Technological innovations are also increasingly part of people's daily lives and, in focusing on food environments, which represent all those food-related elements that surround us in our daily reality, we cannot overlook the role that they and digitization, have had on them. As a result, the concept of the *Digital Food Environment began to spread,* understood as that online ecosystem in which information, services and products related to food are made accessible through digital platforms. It includes websites, mobile applications, social media, e-commerce platforms, and virtual communities that influence users' food choices, accessibility, and eating behaviors. We can also consider it as an augmented experience of the food environment through digital technologies ranging from online campaigns on food education, to interactions on social networks and social media, up to apps and platforms related to food delivery services.

Such digital platforms, by offering e-commerce opportunities, facilitate the online sale of food products and allow users to shop from local farmers, grocery stores, and specialized health food retailers. They offer cooking tutorials, nutrition education and meal planning courses, helping users develop skills and knowledge for sustainable and healthy eating. In addition, social media, social networks, and specialized online forums foster food-focused communities where experiences, recipes, and tips can be shared, creating a sense of belonging and mutual support. The digital food environment therefore fosters the building of communities around food-related interests, allowing people to exchange ideas and support each other in adopting more sustainable and healthy lifestyles. With advances in technology, many digital food platforms provide personalized recommendations based on users' dietary, cultural, religious preferences, and sustainability and health goals. In doing so, the digital food environment encourages people to make informed and sustainable food choices.

Finally, digital food environments can improve access to sustainable diets, particularly in underserved areas, by connecting consumers with local farms, grocery stores, and meal delivery services.

However, these technologies inevitably add further complexity to an already complicated food environment that aims to shape the consumer's food choices. In fact, having taken on a strong centrality in the daily lives of individuals, and consequently also in their food environments, they also have a downside represented by the important impacts with respect to the consumption of unhealthy food products that marketing through social media and

influencers can have on vulnerable consumers such as minors or such as the promotion of unhealthy diets by phantom pseudo-nutritionists.

In this perspective, therefore, there are significant challenges that must be adequately considered by the legislator as with the continuous evolution of technologies, the digital food environment will play an increasingly significant role in transforming food systems and promoting sustainability, health and well-being in communities around the world.

Technology, therefore, represents a powerful driver of change that acts both on the external dimensions of the Food Environment, such as the availability of food, the level of prices, the properties of products, marketing and regulation, and on the personal dimensions, as it is linked to the convenience, desirability and accessibility of food.

The context described highlights the complexity and diversity of the problems and challenges to be faced for the transformation towards sustainable agri-food systems by intervening on the Food Environment and makes it clear that a better understanding of the interactions between agri-food supply chains, food environments and consumer behavior is essential to understand why and how food models today have negative effects on natural resources, on the economy of the territories, on traditions and culture, on the nutrition and health of the Mediterranean populations.

Understanding these dynamics is necessary to develop science- and research-based intervention strategies and approaches to improve the sustainability and the food and nutrition security for all.