Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
https://foodsystemsjournal.org

The potential of bottom-up initiatives to produce a just transformation toward sustainable food consumption

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Submitted June 4, 2025 / Revised September 15 and October 16, 2025 / Accepted October 17, 2025 / Published online December 19, 2025

Citation: Vivas, A. B., Chatzimpyros, V., Stergiadis, C., Borhan Türeli, B., Holman, A., Popusoi, S., & Zorell, C. V. (2025). The potential of bottom-up initiatives to produce a just transformation toward sustainable food consumption. *Journal of Agriculture, Food Systems, and Community Development*, *15*(1), 333–352. https://doi.org/10.5304/jafscd.2025.151.020

Abstract

In the past decade, grassroots communities and citizen collectives have emerged as a bottom-up response to take the lead in addressing social inequalities and environmental sustainability challenges, including the promotion of environmentally sustainable food consumption. These bottom-up initiatives (BUIs) generate new transformative ideas while simultaneously creating resilient communities and a sense of solidarity and collective unity.

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Funding Disclosure

This project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 101036504, project AdvanCing behavioral Change Through an INclusive Green deal (ACCTING).

Despite the growing interest in the potential transformative role of BUIs, there is scarcity of studies investigating their influence at the individual consumer level and exploring mechanisms of potential change. The present study investigated whether participation in BUIs—already being implemented in five countries—is associated with individual change in particular food values and consumption behavior. To do so, we conducted a mixed-methods real-life study focusing on inequalities through the adoption of a gender+ intersectional[1] understanding of vulnerability. The key finding is a significant BUI-related change in sustainable consumption (plant-based and seasonal food) and values (animal welfare and health) associated with healthier and more sustainable food choices in a sample where the majority of people self-identified as being socially vulnerable on diverse and often multiple grounds. We also identify several potential vulnerability-related barriers for change and suggest potential mechanisms driving the changes based on the analyses of the interviews with the BUI's organizers.

Keywords
bottom-up initiatives, gender+ intersectionality, food values, sustainable food consumption

Introduction

Over the past two decades, sustainable food consumption has become an inextricable part of sustainable development. The 1994 Oslo Symposium defined environmentally sustainable food consumption (ESFC) as the use of food products "that respond to basic needs and bring a better quality of life, while minimizing the use of natural resources, toxic materials and emissions of waste and pollutants over the life cycle, so as not to jeopardize the needs of future generations" (Ofstad et al., 1995, para. 1). Although the concept of ESFC has become increasingly appealing to policymakers, producers, and consumers all over the world, actual change at the consumer (and producer) level remains an important challenge. This challenge is particularly pronounced when considering individuals and social groups in socially vulnerable or marginalized situations. Many of these groups lack the time, money, and other resources that allow them to consume healthy and environmentally friendly food, and are instead often struggling to meet their basic dietary needs. In addition, complex intersecting inequalities are often not incorporated in environmental and climate policies and strategies, limiting the effectiveness of efforts to mitigate the impacts of environmental degradation and climate change (Alston, 2014; Djoudi et al., 2016; Kaijser & Kronsell, 2014; Rigon, 2025).

Grassroots community and citizen collectives are emerging as a bottom-up response to take the lead in addressing social inequalities and environmental sustainability challenges, including the promotion of ESFC (Conti et al., 2025; Gernert et al., 2018; Rossi, 2017; Sage et al., 2021). These community initiatives and bottom-up movements generate new, transformative ideas on how issues like sustainable food systems and consumption can be advanced, while simultaneously creating resilient communities and a sense of solidarity and collective unity (Conti et al., 2025; Rossi, 2017; Sage et al., 2021). These initiatives may involve different actors (e.g., citizens' and community organizations, charities, social enterprises, and cooperatives) and may be expressed as self- provisioning in the form of urban gardening or buyer cooperatives (Conti et al., 2025; Sage et al., 2021). Often driven by individuals who themselves come from socially disadvantaged or marginalized backgrounds, they create venues to empower and give voice to social groups and communities that historically have been excluded from political decision-making processes. At the individual consumer level, these initiatives may produce change by influencing food routines and knowledge, but beyond that they aim at changing the current globalized food system by promoting social justice and sustainability (Sage et al., 2021). Although there is growing interest in the literature (Conti et al., 2025; Gernert et al., 2018; Rossi, 2017; Sage et al., 2021) about the potential

[1] This term refers to a social vulnerability framework that considers how gender interacts with other aspects of a person's identity and social categories such as class, sexuality, ethnicity etc. It emphasizes the complexity of identities and the cumulative effects of discrimination on multiple grounds.

of these innovative bottom-up initiatives to create a change in the current food landscape, empirical studies investigating their influence at the individual consumer level and exploring mechanisms of potential change in food behaviors and communities remains scarce.

There are a few studies that have investigated what kind of messages or values should be primed by campaigns, social movements, or interventions to produce a change toward pro-environmental behaviors in general, and sustainable food consumption (SFC) in particular. For instance, Evans et al. (2013) investigated the direct effects of priming (that is, activating associations in memory through exposure to stimuli) self-interested or self-transcending values on car-sharing and recycling behaviors. They concluded that actions that prime self-transcending values may be the most effective way to drive behavioral changes with spill-over effects toward a more sustainable lifestyle (see also Thøgersen, 2013). That is, actions and messages need to address the *right* set of values and motivations to change behavior. On the other hand, information and messages that focus on self-interest (e.g., economic gain) or a mixture of self-interested and environmental motives do not seem to be effective in producing change (Evans et al., 2013; Zorell et al., 2024). Similarly, Hekler et al. (2010) conducted a quasi-experimental intervention study with college students and concluded that it is possible to change food behaviors with educational interventions that focus on social, ethical, cultural, and environmental issues related to food and food production. The authors found that students attending a food-related course increased their consumption of vegetables and decreased dairy products consumption. Scholl et al. (2010) suggested that promoting community values may be another important characteristic of a successful intervention to produce change in behavior toward sustainability (see also Piras et al., 2022).

However, there is limited research investigating the influence of BUIs on individual-consumer food behaviors, and exploring how the citizens leading these initiatives attempt to produce a change at the individual or community levels. In particular, populations with gender+ intersecting inequalities are typically not included in the relevant studies. At the same time, it has been proposed (e.g., Sage et al., 2021) that we are now experiencing a second generation of food social movements, which is more attuned to social justice issues. As Sage et al. (2021) argue, the landscape of BUIs has become more heterogeneous, yet there seems to be a shared goal and vision of challenging power structures, such as the "Big Food" major corporations, and creating alternatives to the current globalized food system. Therefore, it would be important to investigate if participation in the BUIs that are happening now is associated with a change in food values—relating not only to health and environmental benefits but also those relating to social justice food values.

Here, we present results from a study that investigated the following question: Can bottom-up initiatives (BUIs) produce behavioral change toward environmentally sustainable food consumption? The data were gathered in five countries (Belgium, Germany, Greece, Romania, and Türkiye) within the context of a European project (AdvanCing behavioral Change Through an INclusive Green deal, or ACCTING). We also wanted to explore how BUI leaders are trying to produce change at the individual and community levels, so as to identify potential mechanisms of change. By studying the impact of these BUIs on ESFC, the present study also aims to make visible and learn from the inspiring grassroots-driven changes that often are led by socially vulnerable groups.

We employed a real-life quasi-experimental intervention study, where we selected two BUIs related to sustainability and food in each country, and measured participants' values and behaviors at Time one (T1; during their participation in a specific BUI's activity or action selected in advance) and at Time two (T2; after three months) (Hekler et al., 2010; Winkelmair & Jansen, 2023). We adopted this methodological approach so that we were able to study the impact of BUIs that were already happening in five different countries. We were interested in investigating changes in food values that could act as strong enablers for sustainable consumption, namely health and those related with environmental protection, fair trade, local production, and social justice (Kals et al., 2025; Tanner & Wölfing Kast, 2003). In terms of ESFC, we

included measures of consumption of plant-based and seasonally, locally, and organically produced food. We also investigated change in consumption of animal-based food, as it is generally recognized that a reduction of animal-based food consumption is needed for any realistic achievement of greenhouse gas (GHG) emissions and other environmental targets (Clark et al., 2022; Röös et al., 2017). Given the little research on food behaviors and values conducted with populations in vulnerable situations, a second objective was to investigate whether specific food values and behaviors are associated with specific vulnerability categories. Finally, we held interviews with the leaders/organizers of the BUIs with the main objective of investigating the catalysts for change of behavior regarding sustainable food consumption. By conducting interviews with the BUIs' leaders/organizers, we wanted to understand the context of the actions and explore the relation between individual and collective change.

Our main hypothesis was that the importance attributed to health, environmentally sustainable and social justice food values, and the frequency of consumption of environmentally sustainable food would increase after participating in the actions of the BUIs included in the study. Regarding vulnerability, we stated a general hypothesis due to the lack of related research and therefore expected differences between groups with different levels of vulnerability factors in the importance attributed to price, health, social justice, and environmentally sustainable food values, as well as in the frequency of consumption of sustainable food.

Method

Below we describe the methodology of the quasi-experimental study that took place in five countries.

Participants

Overall, 143 participants were recruited across five countries (Belgium, Germany, Greece, Romania, Türkiye). The selection of the countries was determined by the objectives of the ACCTING project, so as to ensure (considering the 13 countries participating in the whole project) a wide geographical distribution of countries across Europe (including Türkiye) and diversity in terms of sociopolitical context and implementation of the Green Deal and the UN Sustainable Development Goals (SDGs). The five countries that participated in this study differ indeed in terms of social and equality policies. For instance, regarding gender equality, whereas Belgium and Germany rank high (twelfth and tenth, respectively) in the Gender Equality Index, Türkiye, Romania, and Greece are far below. There are also differences between the countries with regard to commitment and implementation of the UN SDGs and the European Green Deal. Although there are sociopolitical and geographical differences between these countries, in line with Sage et al.'s, (2021) argument, we put together BUIs from different countries as they all shared a common goal and fulfilled a set of criteria described below.

Recruitment occurred through participation in specific activities (see Table 1) organized by 11 BUIs (two per country, except for Belgium, where three were studied). The BUIs were selected based on a common set of criteria; they (1) can be local or national but are active in the geographical region selected; (2) are concerned with sustainable food activism, and organize community sustainable food activities (e.g., sustainable food literacy or/and cooking community workshops, community organic garden); (3) target potentially vulnerable social groups that are of interest to the gender+ intersectionality perspective; and (4) had planned a relevant action during the period of data collection (February 2024–May 2024). Table A1 (Appendix) describes the selected BUIs for all five countries based on the qualitative analysis of the interviews.

Overall, the sample included a wide age range from young adults to older adults up to 84 years old (see Table 2), from all income and educational levels, although the majority of participants had obtained a secondary school or university degree and self-reported belonging to middle-high economic status (coping or living comfortably on present income). In line with the gender+ intersectional focus, the majority of the sample identified as women (68.5%). Moreover, 96 (67.1%) participants self-identified as being members of a group that is marginalized or discriminated against in the country they lived in. From the initial sample, 69

participants completed the follow-up assessment three months after their participation in the action organized by the BUI. In line with the relevant literature (Galvim et al., 2019), there was a relatively high overall drop-out rate (48.25%), although it varied across countries.

People were recruited during the events organized by the BUIs, which served as a real-life intervention (T1 assessment). Since the events took place at different locations, some of the participants were recruited face-to-face by the researchers who approached them at the event, while others were recruited with the help of the BUIs organizers who acted as community leaders. The study was approved by the local ethics committees of each country research team (the Ethics Committee of the Psychology Department of the University of York Europe Campus in Thessaloniki, Greece; Ethics Committee of the Faculty of Psychology and Educational Sciences, Alexandru Ioan Cuza University of Iasi; the Swedish Ethical Review Authority, Sweden; Sabancı University Research Ethics Council, Türkiye), and informed written or online consent to participate in the study was obtained from all the participants.

Design

The study employed a mixed methodology design that included quantitative self-report tools to measure values, motives, and behaviors of the people participating in the BUIs, and interview questions with the organizers of the BUIs.

Measures

Quantitative measures

A larger set of measures was included at assessment in Time 1 (T1) to study associations between food values, vulnerability variables, and other behavioral variables of interest (e.g., food shopping). The main reason to include a smaller set of measures at assessment in Time 2 (T2) was based on the feedback from participants at T1 that the assessment was lengthy.

Explicit food values. We selected the Sustainable Food Choice Questionnaire (SUS-FCQ, Verain et al., 2021) since it expanded the original FCQ to include additional items to measure values and motives relating to sustainability as a multifaceted concept. It consists of 49 items (e.g., *It is important to me that the food I eat on a typical day: Is*

Table 1. Summary of the Intervention Activities of Time One (T1) Assessment

Country / BUI name	T1 activity	Duration	Location
Belgium / Cultureghem's Dreamkitchen initiative	Cooking activity and shared meals	~5 hours	Community center
Belgium / De Kompaan & Veltl	Cooking activity and shared meals	~3–4 hours	Community center
Belgium / La Ruche qui dit Oui	Direct delivery of pre-orders local food	Friday evening	Community center
Germany / Community Kitchen	Community kitchen	~5 hours	Community building
Germany / Free Food e.V. Göppingen	Free good booth	~3 hours	Central city market
Greece / Pervolarides	Social kitchen and cooking literacy workshop	One full afternoon (~4 hours)	Community center
Greece / MAMAGEA	Edible Forest Project walk and a documentary projection	One full afternoon (~4 hours)	Elementary school
Romania / Lasi in food fair	Small-scale producers' food fair	3–4 days	Central location in the city
Romania / Lasi cooking studio	Cooking literacy workshop using local and ecologically produced vegetables	~3–4 hours	Cooking studio in the city
Türkiye / VEGAACADEMIA	Online seminars on vegan cooking with interactive sessions	2 days	Online
Türkiye / BOUNVEG	The Vegan Summit with speeches, panels, and vegan products testing	1 day	University campus

produced with sufficient space for the animals) and it employs a 7-point Likert scale (1 – Not at all important, 2 – Low importance, 3 – Slightly important, 4 – Neutral, 5 – Moderately important, 6 – Very important, 7 – Extremely important). The questionnaire was translated and back translated into the relevant languages of the team of researchers. Twelve subscores based on previous studies (Verain et al., 2021) were derived from the SUS-FCQ: health (items 1–6), mood (items 7–12), convenience (items 13–17), sensory appeal (items 18–21), natural content (items 22–24), price (items 25–27), weight control (items 28–30), familiarity (items 31–33), animal welfare (items 34–38), social justice (items 39–41), environment welfare (items 42–46), local and seasonal (items 47–49). Higher scores

Table 2. Descriptive Statistics of the Overall Sample at Each Assessment Time, and per Country Separately

	Overall Sample		T2 Sample		Belgium		Germany		Greece		Romania		Türkiye	
	N = 143		*N* = 69		*N* = 23		*N* = 39		*N* = 21		*N* = 24		*N* = 36	
	M (SD)	Range	M (SD)	Range	M (SD)	Range	M (SD)	Range	M (SD)	Range	M (SD)	Range	M (SD)	Range
Age (years)	39.50 (16.88)	17–81	41.84 (15.19)	17–75	48.39 (15.57)	20–84	43.28 (19.25)	17–81	54.57 (11.20)	33–75	30.21 (8.72)	20–49	27.11 (7.67)	19–53
	%		%		%		%		%		%		%	
Gender														
Woman	68.5		65.2		82.6		64.1		47.6		83.3		66.7	
Men	25.2		33.3		17.4		30.8		47.6		12.5		19.4	
Nonbinary	4.9		1.4		—		5.1		4.8		4.2		8.3	
Prefer not to say	1.4		—		—		—		—		—		5.6	
Education Level														
No degree	5.0		7.2		4.3		2.6		23.8		—		—	
Primary	2.1		4.3		—		—		14.3		—		—	
Secondary	29.1		20.3		34.8		38.5		23.8		33.3		13.9	
University	53.2		55.1		52.2		41.0		38.1		62.5		66.7	
Vocational	10.6		13.0		8.7		12.8		—		4.2		19.4	
Income Level*														
Very Low	9.2		10.1		4.3		5.3		38.1		4.2		2.8	
Low	14.1		17.4		17.4		13.2		19.0		25.0		2.8	
Middle	40.1		36.2		21.7		36.8		28.6		41.7		61.1	
High	33.8		33.3		52.2		42.1		9.5		29.2		30.6	
Prefer not to say	2.8		2.9		4.3		2.6		4.8		—		2.8	
Caring Responsibility														
Yes	38.0		47.8		65.2		41.2		76.2		29.2		2.8	
No	62.0		43.5		34.8		58.8		23.8		70.8		97.2	
Migrant Status														
Migrant**	12.7		13.0		34.8		15.8		14.3		4.2		—	
Nonmigrant	86.6		87.0		60.9		84.3		85.7		95.8		100	
Prefer not to say	0.7		—		4.3		—		—		—		—	
Geography														
Large city	63.6		62.3		30.4		48.7		90.5		70.8		80.6	
Suburb	9.8		10.1		—		10.3		9.5		16.7		11.1	
Small city	21.7		24.6		52.2		33.7		—		12.5		8.3	
Village	4.9		2.9		17.4		7.7		—		—		—	
Farm in countryside	—		—		—		—		—		—		—	

*Income level: Very low = "Finding it very difficult on present income," Low = "Finding it difficult on present income," Middle = "Copying with present income," High = "Living conformable on present income"; **Migrant = First generation, a person not born in the country of testing.

indicate more importance attributed to the overall value subcategory.

Food consumption. Self-reported frequency of consumption of specific foods during the three months before T1 and T2 assessments was measured with an adapted version of the Harvard Food Frequency Questionnaire (Willett et al., 1988): "*For each food category indicate how often on average you have consumed it during the last 3 months*." Ten food categories were included in this measure: local/regional products, fruits/vegetables, seasonal vegetables/fruits, organic vegetables/fruits, vegetarian meals, vegan meals, eggs and/or dairy products, fish/seafood, meat/poultry, organic or/and free-range meat/poultry. Additionally, for each food category, six alternative responses were available: never or less than once per month (0), 1–3 per month (1), 1 per week (2), 2–4 per week (3), 5–6 per week (4), 1 per day (5), 2–3 per day (6), 4–5 per day (7) and 6+ per day (8). In the analyses, we included one composite measure of plant-based consumption (Plant_consumption = average score of Fruits/vegetables, Vegetarian meals and Vegan meals items) and three other measures (Seasonal_consumption = scores of seasonal vegetables/fruits; Organic plant_consumption = scores of organic vegetables/fruits; Local_consumption = scores of local/regional products) of sustainable food consumption, and a measure of meat-based food consumption (Meat_consumption = scores of meat/Poultry). Higher scores on these measures reflect higher frequency of consumption.

Food retailer choices. A measure of self-reported frequency of food shopping from different food retailers was adapted from Cicia et al. (2021) and Gerson et al. (2013). "*In the previous three months: When you bought food, how often did you buy at the following sales locations*?" Eight alternatives were given: grocery stores, supermarkets (in store and online), producer/cooperatives (in store and online), street markets, and farmers' markets. For each retail channel, six responses were available: never (0), seldom (1), once a month (2), two or three times a month (3), once a week (4), and more than once a week (5). Respondents were provided with the following definition of farmers' market: "Farmers' markets are places where a group of farmers come together, usually once a week, to sell their products." In the analyses we included two composite measures: one of conventional retailers (Conventional_Shopping = average score of items of grocery and supermarket for both in store and online) and one of more sustainable food shopping (Producers_Shopping = average score of items of producers/cooperative both in store and online), and the two items regarding street markets ("Street M") and farmers' market ("Farmer M"). Higher scores in these dependent variables indicated a higher frequency of buying food from that particular type of retailer.

Activism. This question was used: "*For each of the sources of information/education/activism indicated below, please answer the response indicating how often on average you participated/attended/engaged with the activity in the last year*" for the T1 assessment and "*in the last three months*" for the T2 assessment. The response categories included environmental sustainability social movements/activities; animal rights social movements/activities; social justice and rights social movements/activities; sustainable food systems related activities/social movements; read/viewed, produced/shared content/information promoting sustainable food consumption; and cooking courses to promote reduced food waste or/and consumption of seasonal/local/organic food. For each item, six alternative responses were available: never (0), seldom (1), once a month (2), two or three times a month (3), once a week (4), and more than once a week (5). A total sum score was calculated by adding the scores from each of the five items. Scores could range from 0 to 30. Higher scores indicate greater engagement with activism.

Food decision-making and responsibility. To assess who in a respondent's household was the decision-maker and had the responsibility for shopping and cooking food, we added the two following open-ended questions: "*If you think of a typical week, who usually makes decisions about food (shopping/ planning) in your household? And who is typically responsible for cooking the food in your household?*" Responses to these questions were included as categorical variables with three categories: *participant* (the person filling in the questionnaire), *shared* (shared responsibility between the person filling in the questionnaire

and another person in the household), and *other person in the household.*

Demographics. Nine questions developed by the ACCTING team were included in the demographic section. The questions included information about gender, age, geographical location, nationality/migrant status, caring responsibilities, and education and perceived income levels. Additionally, participants were asked a question aimed at obtaining information about ACCTING vulnerabilities as perceived by the individuals themselves. Specifically, the question stated, "*ACCTING aims at empowering and giving voice to communities and people that may be less included in the society or/and more discriminated against due to socio-demographic and other characteristics. Therefore, we kindly ask you to indicate below if you identify yourself as being a member of a group that is marginalized or discriminated against (in the country where you live) on the grounds of…*" Participants could choose one or more of the following options: gender; LGBTQ+ status; age; disability; nationality and/or migrant status; religion/beliefs; language; ethnic, racial, and/or social origin; social class; geographic location; other; and prefer not to say. For the option "other," they were given the opportunity to specify it by writing in a blank space.

In the T2 assessment, the following measures from above were included: explicit food values (SUS-FCQ), food consumption, and activism.

Qualitative methodology

Interviews were conducted with the leaders/organizers of the BUIs with the main objective of investigating the catalysts for behavioral change regarding sustainable food consumption. To ensure consistency in data collection, we aimed to create a standardized process for collecting qualitative data and used structured interviews. This allowed the BUI organizers to share aspects of their experiences with the initiatives and discuss possible mechanisms of change while retaining a level of structure in their answers. The interview guide started with general questions about their involvement in the initiatives and the core values they promote. It then focused on change through participation in the initiatives. The duration of the interviews ranged from 22 minutes to 1 hour and 45 minutes.

Procedure

A common procedure was followed by all country research teams, with a degree of variation and flexibility in adapting the procedures to specific contexts. This adaptability was necessary given the fieldwork-based approach and the real-life settings in which data collection took place. Researchers recruited participants and conducted the study in the natural environments where the BUIs operated and conducted their activities (see Table 1). Data collection across all countries took place between February and August 2024. Below, we briefly describe the procedures followed in each country.

Belgium. Group interviews (two persons each) with the Cultureghem and Velt/De Kompaan and La Ruche qui dit Oui! organizers were conducted in person. Participants were recruited at the venues of the initiatives, and they completed the study on a laptop or in a print version. Follow-up, T2 data collection took place online via a Google Form.

Germany. In the case of Community Kitchen, recruitment and data collection took place face-to-face at a Sunday brunch. Potential participants were approached by the researcher, and if they agreed to participate, they could do it either online (using the researcher's tablet) or fill in a print version. For the Free Food event, a booth was assembled by the Free Food team in the middle of the central market square, and the researcher approached individuals standing around the booth or in the queue. Participants completed the study on the site by filling in printed versions or online. In both cases, participants were contacted by email and invited to participate in T2 assessment online via SoSci survey.

Greece. For Mamagea, the local researchers brought tablets, laptops, and printed copies of questionnaires to the event held at a local school, approaching participants as they arrived. For T2, assessment participants were contacted by email and completed the second part of the study online. For Pervolarides, participants were recruited in the "Social Kitchens" and "Cooking Literacy" workshop, which took place at the community premises of the BUI. Participants completed the study using the researcher's laptop or by filling in a printed copy. For the T2 assessment, the Pervolarides

mediator contacted those who had given consent and invited them to participate in the second part by coming into the Pervolarides community space to complete the study.

Romania. Data collection for the first BUI took place during a seminar at a fair on locally produced vegetables. The local researchers approached individuals at the event, and participation was online via Google Form or by filling in printed copies. For the second initiative, recruitment took place during a three-hour cooking literacy workshop. Participants completed the study online via Google Forms. In both initiatives, participants were contacted via email and invited to complete the T2 assessment online.

Türkiye. For Vegacademia, participants were recruited online, as the two-day event was held virtually, and completed the study online. For BOUNVEG, participants were recruited on-site at the event venue and completed the study by filling in a paper or online version. In both cases, participants were contacted by email for the T2 assessment and invited to complete the follow-up survey online.

Results

Below we present the results from the analyses of the quantitative data from the self-report measures, and the qualitative analyses from the interviews with the organizers of the BUIs.

Quantitative Analyses

Analyses on the influence of BUI participation on food values and consumption

To test the main hypothesis that participation in BUIs would produce a change in environmental and sustainable food values and actual food consumption, we conducted paired t-tests to compare scores at T1 (participation in BUI) and T2 (three months after participation) on food values and consumption behavior (see Table 3). Regarding food values, the results showed significant differences between T1 and T2 for the values relating to health and animal welfare in the overall sample. That is, three months after participating in the BUI's activity, participants attributed significantly higher importance to the food they eat to be healthy, $t(68) = 4.13$, $p < .001$, and respectful of animal welfare, $t(68) = 3.94$, $p < .001$. Participants' scores in T1 and T2 did not significantly differ for food values regarding social justice, environmental welfare, and local and seasonal (all p values $< .05$).

With regard to food consumption measures, there were significant differences between T1 and T2 for plant-based and seasonal food. That is, after three months of BUI participation,

Table 3. Differences in Food Values and Consumption Measures as a Function of Time (Time One [T1] vs. Time Two [T2] Assessment)

	Assessment time (N = 69)			
	T1	T2		
	Mean (SD)	Mean (SD)	*t*	*p*
FCQ_H	5.20 (.17)	5.45 (.11)	4.13	<.001
FCQ_A	5.04 (.17)	5.47 (.16)	3.94	<.001
FCQ_J	5.74 (.15)	5.84 (.16)	.77	.436
FCQ_E	5.59 (.12)	5.56 (.17)	.79	.797
FCQ_L	5.29 (.15)	5.29 (.16)	.14	.888
COMS_CPLANT	3.30 (.21)	3.68 (.18)	2.49	.016
COMS_SEASO	4.05 (.19)	4.77 (.24)	3.20	.001
COMS_ORG_PLANT	2.85 (.30)	2.85 (.39)	.12	.919
COMS_LOC	3.62 (.27)	4.03 (.20)	1.42	.159
COMS_MEAT	2.04 (.18)	1.99 (.18)	.41	.682

Note: FCQ_H = Mean Score for the Health subfactor of the FCQ; FCQ_A = Mean Score for the Animal Welfare subfactor of the FCQ; FCQ_J = Mean Score for the Social Justice subfactor of the FCQ; FCQ_E = Mean Score for the Environment Welfare subfactor of the FCQ; FCQ_L = Mean Score for the Local&Seasonal subfactor of the FCQ; COMS_CPLANT = Composite mean scores of the frequency of consumption of Fruits&Vegetables, Vegetarian meals and Vegan meals; COMS_SEASO = Frequency of consumption of seasonal fruits and vegetables; COMS_ORG_PLANT = Frequency of consumption of organically produced fruits and vegetables; COMS_LOC = Frequency of consumption of locally produced food products; COMS_MEAT = Frequency of consumption of Meat/poultry; COMS_ORG_MEAT = Frequency of consumption of organically produced or/and free-range meat and poultry.

participants reported a higher frequency of consumption of seasonal, t(68) = 3.20, p =.001, and plant-based food, t(68) = 2.49, p =.016.

Additionally, we conducted Pearson correlations between the overall score of activism (frequency of participation and engagement with sustainability and food related activism) and the environmental and sustainable food values, food consumption, and shopping behavior. The measure of activism showed small to moderately significant correlations with almost all the outcome variables of interest (see Table 4). People who participate more often and in more kinds of food and environmental related activities and social movements also report that it is more important that the food they eat is animal-friendly and environmentally friendly, and is produced and treated in line with social justice values. They also eat sustainably produced food more often in their daily life and buy their food more often from producers/ cooperatives and farmers' markets.

Table 4. Pearson Correlations Between Activism and Food Consumption and Shopping Behaviors and Sustainable Food Values (n = 143)

Food Consumption	ACTIVISM_OVERALL
Plant	.330**
Seasonal	.326**
Organic_Plant	.303**
Local	.369**
Meat	-.178*
Food Shopping	
Supermarket_C	**-.202***
Producers_C	**.298****
Street M	.071
Farmer's M	**.270****
Sustainable Food Values	
FCQ_A	.315**
FCQ_J	.248**
FCQ_E	.323**
FCQ_L	.187*

* p < .05, ** p < .01; FCQ_A = mean score for the Animal Welfare subfactor of the FCQ; FCQ_J = mean score for the Social Justice subfactor of the FCQ; FCQ_H = mean score for the Environment Welfare subfactor of the FCQ; FCQ_L = mean score for the Local and Seasonal subfactor of the FCQ.

Gender+ inequalities analyses

To explore the gendered division of roles in relation to making decisions about food shopping and cooking, we looked at the results of responses to the question "in a typical week, who made decisions about food shopping/planning and who was responsible for cooking in their household?" A substantial majority of women participants (74.7%) reported being solely responsible for food-shopping decisions in their household. With regard to cooking, the majority of women (65.3%) also responded that they were the only ones responsible for preparing the food in their households.

To investigate how people may differ on food values and consumption as a function of income-related vulnerability, we formed three income groups from the T1 sample (n = 143) based on the self-report measure: low income (*very difficult and difficult to cope on present income*, N = 33), middle income (*coping on present income*, N = 57), and high income *(living comfortably on present income*, N = 48). To compare the three income groups on food values, we then submitted mean scores from the FCQ to a mixed 3 x 6 analysis of variance (ANOVA) with income group as the between subject factor and food value (health, price, animal welfare, social justice, environment welfare, and local and seasonal) as the within-subject factor. The main effect of food value reached statistical significance, F (5, 675) = 12.21, p < .001. LSD pair-wise post-hoc comparisons showed that the most important food value for the overall sample when choosing food was social justice (mean = 5.91), which differed significantly from health (mean = 5.19, p < .001), price (mean = 5.61, p = .019), animal welfare (mean = 5.35, p < .001), and local and seasonal (5.08, p < .001). The second most important values were price (mean = 5.61) and environmental welfare (mean = 5.601). The scores for price were significantly higher than for health, p = .001, and local and seasonal, p = .001, whereas scores for environmental welfare significantly differed from those for health, p < .001, animal welfare, p < .001, and local and seasonal, p < .001. Finally, the scores for animal welfare were also significantly higher than for local and seasonal, p = .021. The main effect of income group did not reach statistical significance, F (2, 135) = 1.44, p = .240.

However, the income group by food value interaction was also significant, F (10, 675) = 2.437, p = .007. To analyze the interaction, we first conducted one-way ANOVAs for each food value with income group as the between subject factor. The main effect of the income group was only significant for the price value, F (2, 135) = 12.35, p < .001, and post-hoc comparisons showed that for the high-income group (mean = 4.98) price was less important than for both the low income (mean = 6.19, p < .001) and the middle income (mean = 5.71, p = .001) groups, with no significant difference between these two groups (p = .069). The main effect of income group did not reach statistical significance for the health, F (2, 135) = .81, p = .443, animal welfare, F (2, 135) = .543, p = .582, social justice, F (2, 135) = .22, p = .803, environmental welfare, F (2, 135) = .169, p = .845, and local and seasonal, F (2, 135) = .32, p = .723.

We also conducted three separate repeated measures ANOVAs, one per income group, with food values as the within subject factor. The main effect of food value reached statistical significant for all three groups, F (5, 145) = 7.24, p < .001, F(5, 265) = 7.68, p < .001, and F (5, 225) = 4.46, p < .001, for the low-, middle-, and high-income groups, respectively. Bonferroni corrected post-hoc comparisons for the main effects; however, showed different patterns with regard to the most important values in each income group. In the low-income group, price was rated as the most important food value. Participants placed significantly more importance on their food being cheap and a good value for the money compared to their food being good for their health, produced with respect to animal welfare, or local and seasonal (all p values < .05). Additionally, they placed significantly more importance on the foods they eat aligning with their social justice values than local and seasonal factors, and with respect to animal welfare (all p values < .05). For the middle-income group, price was also an important food value, and significantly more important than food being produced locally & seasonally and with respect to animal welfare (all p values < .05). For this group, the most important food value was social justice, relative to animal welfare, and local and seasonal (all p values < .05). Finally, for the high-income group, the most important food values were social justice and environment welfare, which were significantly more important than price, health, animal welfare, and local and seasonal (all p values < .05).

Finally, to test whether there were significant differences between the income groups on actual food consumption, we conducted five separate one-way ANOVAs, one for each consumption dependent variable. The results showed significant differences between the income groups only for the plant-based composite consumption, F (2, 135) = 3.95, p = .021. Post-hoc comparisons showed that the low-income group consumed plant-based food significantly less frequently (mean = 3.04), than both the middle (mean = 4.07, p = .008) and the high-income group (mean = 3.96, p = .023), which did not differ significantly, p = .735. The main effect of the group for the local, seasonal, organic vegetables and fruits, and meat and poultry did not reach statistical significance; F (2, 135) = .04, p = .953; F (2, 135) = .84, p = .433; F (2, 135) = .35, p = .707 and F (2, 135) = 2.21, p = .113, respectively.

The sample recruited includes a wide age range (see Table 2), and a substantial percentage of people reported feeling discriminated against or marginalized on the grounds of age alone (11.19%), or in combination with other characteristics (13.98%). To investigate the association between age and our outcome variables of interest (food values, food consumption, and activism), we conducted Pearson correlations. Results show that, with regard to food choices, older people attributed more importance to the food containing natural ingredients (e.g., no additives), r = .370 p < .001; being familiar to them (e.g., "is like the food I ate when I was a child"), r = .209 p = .012; and being produced locally and seasonally, r = .229 p = .009. In terms of correlations between age and food consumption, the older the participant, the less frequently they ate plant-based food (r = -.308, p < .001), and the more frequently they ate meat and poultry (r = .294, p < .001).

Qualitative Analyses

Results from the interviews with BUI organizers are presented in Table 1. The analysis of the results of the interviews focused on identifying the factors

that contributed to behavioral change among participants. Three overarching themes emerged from the interview data: individual behavioral change, community/societal change, and mechanisms of change.

Individual level of change

Individual behavioral change was driven by exposure to the activities of the initiatives as well as interpersonal interactions within the BUI community. Through exchanging ideas and practices related to sustainability, participants began adopting new behaviors and attitudes. These changes range from altering cooking practices and food waste practices to a re-evaluation of beliefs concerning animal rights. Participants also expressed increased interest in adopting a vegan lifestyle, not only for health or environmental reasons but also as an ethical stance, and an increased preference for local and seasonal produce.

Community/societal change

Many of the BUIs had a strong impact by bringing people together and fostering a sense of belongingness and togetherness to empower participants, as well as enable each other to bring change to a wider level by working as a community. Events organized by the initiatives brought people together, fostering an environment of acceptance so participants could freely exchange opinions and engage in discussions. Information was also provided to participants, as well as more practical tools ranging from cooking skills for more sustainable food consumption to skills in gardening, composting, and food rescue. These skills, along with the fostering of a sense of belonging between participants, have acted as mechanisms of small community changes in many locations where the initiatives were implemented across the countries.

Mechanisms of change

Main mechanisms of change seem to stem from two actions. The first is creating a sense of togetherness between participants to enable community-building under a common cause. Bringing people together and uniting them through a shared value regarding sustainability *i*s capable of fostering change. The second main mechanism of change is through teaching actual skills, such as cooking with vegetables and sharing practical information and education on food. These skills are then adopted by the participants, who replicate them in their own lives outside the initiative and also share them with other acquaintances and others important to them, as well through synergies with schools and other social agents, creating a snowball effect of change.

Discussion

The results from the present study show that there was a significant increase among participants in the importance attributed to animal welfare and health when choosing food, and in the frequency of consumption of plant-based and seasonal food three months after participating in an initiative organized by a BUI. This BUI-related change was observed in a sample where the majority of people self-identified as being socially vulnerable on diverse and often multiple grounds.

The present study is novel in that it employs a real-life approach to study the impact of BUIs that are already taking place. Nevertheless, this was a quasi-experimental study, with a single intervention group, so we cannot conclude that the important changes observed in the study are the direct result of participating in the BUIs. The qualitative analyses from the interviews with the organizers of the BUIs, however, suggest that two mechanisms could have driven the observed changes. The first mechanism has to do with the role of BUIs in enabling community-building under a common cause. Bringing people together based on common values around sustainability and social justice seems to be able to foster change (Rossi, 2017; Sage et al., 2021). This driver of individual change, as perceived by the organizers, supports the conclusion of Scholl et al. (2010), as well as previous research on food-related social innovations. Zoll et al. (2024) argued that engagement in grassroots initiatives such as community gardens and food cooperatives is driven by the desire to foster community, reconnect with nature, and embrace sustainable lifestyles. Thus, these initiatives foster a sense of belonging and collective empowerment, which in turn contribute to increased engagement in sustainable food consumption. The second mechanism of

change is increasing knowledge and skills on sustainable food. This is in line with previous research on sustainable communities that emphasizes the significance of education, guidance, and awareness-raising initiatives in enabling individuals to make sustainable choices (Candau & Axon, 2025).

With regard to gender+ intersectional vulnerability, we found that financial vulnerability remains a significant barrier to the adoption of sustainable and healthy food practices. This is not a novel finding, but the present results, when including samples in five countries with diverse sociopolitical contexts, reinforce the suggestion that people with financial vulnerability may adopt less environmentally sustainable and healthy diets due to structural barriers. Specifically, the low-income group in our study reported significantly less frequent consumption of plant-based food than the other two groups. Previous studies have proposed that individuals facing economic hardships may prioritize short-term economic needs over long-term health and environmental benefits, often leading to the adoption of less healthy and environmentally sustainable diets (Kenny et al., 2023; Muñoz-Martínez et al., 2024). Our study highlights once more the importance of considering access and structural barriers if we are to achieve sustainable, healthy, and inclusive food systems.

Our study also suggests that familiarity could act as a barrier for older people to adopt environmentally sustainable food diets; as the age increased, the importance of consuming familiar food was significantly higher. At the same time, older people reported having less healthy and environmentally sustainable diets; they reported eating plant-based food less frequently, and meat and poultry more frequently, than younger participants. This finding is in line with previous studies showing that older individuals might favor familiar foods instead of trying new, unfamiliar, or less traditional choices, even when those alternatives are more sustainable (Bloom et al., 2017; Criss et al., 2020; Locher et al., 2009). A recent study in Germany (Knobl & Mata, 2024) showed that younger family members advocated more for plant-based food consumption than their parents.

The present study also suggests that women may be important drivers of change for sustainable food consumption. Across all countries, the majority of women reported being the only one responsible in their household for making decisions with regard to food planning, shopping, and cooking. This finding, in combination with previous findings of women being more receptive to embracing sustainable diets compared to men (Dupuits et al., 2024; Sandri et al., 2024), highlights the role of women as drivers of change toward sustainable and healthy food systems.

The present study has several limitations that need to be acknowledged. The study employed a cross-sectional design with self-reported measures of food preferences and consumption that may have led to biases in participants' responses. We opted for this design to accommodate the inclusion of hard-to-reach individuals in vulnerable situations, so we aimed at keeping the data collection processes as uncomplicated as possible. Due to the relatively high dropout at the second assessment, we were not able to explore potential differences in change as a function of contextual factors, such as country or type of BUI (Tanner & Wölfing Kast , 2003). Although there was a common set of criteria to select the BUIs, and they were all concerned with promoting environmentally sustainable food systems, they differed in their specific aims and type of activities. The five countries may also differ in other aspects relating to sociopolitical context and food consumption behavior, such as social norms for green purchase and the availability of environmentally friendly food products (e.g., local markets). Therefore, the overall analyses across the five countries may have overlooked contextual differences that may have produced changes in different values or behaviors in each country or BUI. Future studies should investigate how context-specific factors may influence the impact of BUIs on food values and subsequent food choices.

When searching and selecting the BUIs, we found that there was a flourishing environment in the five countries of grassroots communities and citizen collectives that are taking the lead in tackling social inequalities and sustainability challenges. However, the existing BUIs were often struggling with human and economic resources and so could not organize regular activities and actions targeting their local communities. This posed additional

challenges to the study design. The BUIs in this study demonstrate potential for creating change, particularly in promoting environmental awareness and food sovereignty. However, their scalability and impact may be limited by their lack of resources, and there is the additional burden to constantly increase their community reach. While the actions studied are replicable in other contexts, their impact depends on their success in involving their communities and support from local institutions. Further studies should examine effective models and frameworks for BUIs' efforts to produce long-lasting and system-level changes without compromising their deep community engagement. In line, some authors (e.g., Conti et al., 2025) have proposed that neither bottom-up nor top-down initiatives alone can achieve transformation, and that hybrid modes of collaboration are needed.

Conclusions

The findings from the present study underscore the transformative potential of BUIs in shifting food values and consumption patterns towards sustainability, particularly when these initiatives foster community connection and provide practical tools for food literacy. However, the scalability of BUIs and their activities is often limited by resources and an ambition to constantly expand their reach. Both top-down and bottom-up processes are key for increasing access to healthy and environmentally sustainable food for social groups that are economically vulnerable, and for whom high prices are key obstacles. Our study suggests that an important direction for policy recommendations is to empower and sustain grassroots initiatives that are already happening in the ground. This could be achieved through, for instance, (a) initiating platforms for BUIs to share resources, best practices, and tools for scaling up their activities effectively; and (b) facilitating mentorship and targeted financial support for women leading food-related BUIs, and for those BUIs that are focused on socially vulnerable groups. However, to overcome access barriers, there is also a need for top-down policies and processes to strengthen affordability by, for instance, introducing exchange taxes that make environmentally sustainable food more affordable, cross-financed by increased taxes on environmentally harmful foods. We hope that by making already successful initiatives on the ground visible, we can learn from them and emphasize the importance of engaging diverse populations as change actors, providing an alternative for "climate trauma" (Craps, 2020) in the form of "active hope" (Macy & Johnstone, 2012).

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Appendix

Table A1. Qualitative Analysis of the Interviews Conducted with the Bottom-up Initiatives (BUIs) Included in the Study

Country / BUI name	BUI Aim	Individual-Level Behaviors	Community / Societal Changes	Mechanisms of Change
Belgium / Cultureghem's Dreamkitchen initiative	Give back public space to the local community. Strengthen community ties among the local population. "Dreamkitchen" fosters social cohesion through cooking.	Eat less meat as the cooking is done with leftover vegetables and fruits from a Sunday market. Enable newcomers to find their way, give them skills and tools, and put them in touch with partner organizations. Learn cooking skills but also go beyond that and learn a trade to empower them and produce change.	Create life in the neighborhood, create opportunities for people to meet and foster social cohesion. Strengthen community ties.	Work in short supply chains, with fair remuneration and create alternative systems to make quality food accessible to everyone. Teach a trade to people from which they get empowered and produce change in their lives.
Belgium / De Kompaan & Velt	Promote ecological ways of living, cooking and gardening through initiatives. A neighborhood house that primarily focuses on social cohesion, improving ties between people of various walks of life living in the area.	Learn to cook with new ingredients. Learn to cook and eat vegetable-based dishes. Learn to cook for a large group of people and work collaboratively. Limit food waste and reinforce the value of treating the cooking space with more respect and cleaning it regularly.	Bring people of various walks of life together and to practice being together and collaborating. Engage in collaborative gardening and share necessary knowledge to stimulate a more sustainable way of living with regard to food production and consumption.	Inclusive togetherness from which learning and change can occur. Practice more sustainable forms of cooking that people can then adopt and replicate in their own lives.
Belgium / La Ruche qui dit Oui	Have an impact on local food, and promote short supply chains by bringing all the producers together in one place to make life easier for the consumer and also reduce food waste.	Change buying and consumption habits regarding food.	Environmental and health: • Environmental change is produced by reducing distance and travel for both consumers and producers. • Change in health is produced by focusing on seasonal, quality produce with a vision of sustainable agriculture.	Bring awareness on sustainable food, promote special prices on food, and offer fair prices.

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Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
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Germany / Community Kitchen	Minimize food waste at and across as many levels as possible. Use food as a vehicle for education and raising awareness.	Get individuals to minimize food waste. Get individuals to be more considerate about resources. Indirectly, enable individuals to become active citizens in the democracy.	Minimize or end food waste by making use of rescued food and getting other actors to both reduce and re-use food "waste."	Offer high-quality meals in the restaurant and cafe, and high-quality products for sale (jam, chutneys, ratatouille, etc.). Environmental education of children with the intention that they spread it to their parents and families. Participatory kitchen for volunteers; interested volunteers can also go together to the central food market (where they get lots of rescued foods).
Germany / Free Food e.V. Göppingen	Fight and reduce food waste and focus in particular on the poorer, disadvantaged members of the population and bring the rescued food to them. Increase awareness and food literacy among disadvantaged members of the population and in society at large.	Individuals reduce their food waste and become open to consuming rescued food (e.g., decrease prejudices and false beliefs about best-before dates, food edibility).	Make citizens, companies, etc., more aware of the impact of food waste and the need to change patterns of behavior (awareness and literacy), and distribute the rescued food to people who really need it in order to contribute to social justice.	Activities like breakfasts for seniors and workshops for different target populations where they inform about and show how to reduce food waste, with different learning objectives depending on the group of people and occasion. Organize food distributions at different locations where they attract people who are curious and interested in getting food for free and then use this as an opportunity to start conversations with them.
Greece / Pervolarides	Promote social solidarity through food, based on food and the relationships formed throughout the food cycle (from seeding and cultivation, harvesting, processing, and cooking, to the reclamation and processing of wasted food).	Strengthen very vulnerable individuals to become empowered and more active in their everyday lives. Focus on behavioral changes related to sustainable food by promoting its advantages for the individual's health. Try to change current opinion on the nutritional value of plant-based food (that they do not hold the same nutritional value as meat-based ones), which is the main type of food used by the initiative.	Promote the framework of the do-it-yourself culture on making seed bombs, composting, gardening, and food rescue.	Social kitchens organize workshops on household self-sufficiency and food sovereignty. Collaborate with public schools and social agencies by providing consultancy and expertise in food processing and the development of zero-waste communities.

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Greece / MAMAGEA	Develop social cohesion, tackle climate change, and strengthen communities and human networking. Educate children on sustainability, climate change, and the importance of human rights and solidarity.	Change citizens' habits when it comes to accessing fresh fruits and vegetables by showing them that they can cultivate their own food locally, in urban gardens, limiting the transportation of products across longer distances.	Bring together the community to cultivate environmental awareness and promote new forms of participation and cooperation to improve living conditions in different neighborhoods in Thessaloniki (and other cities). These aims are targeted through their latest project Food Forest, initiated in the western part of the city.	Educational and art workshops. Communication and cultural management, where they create comprehensive communication actions and awareness campaigns, such as the ECOGNIZE project, whose main goal was to generate knowledge and creatively mobilize groups of young people in the city with respect to the issues of climate change and climate migration.
Romania / Lasi in food fair	Promote local producers from the North-East region of Romania. Facilitate the link between small producers and direct consumers in Iași to showcase local and regional traditional ingredients and educate the public about regional cuisine and children about the differences between ecological and conventional food.	Increase the use of local and regional produce. Foster the use of seasonal food supplied by local producers. Minimize food waste.	Educate individuals in local and seasonal products produced by small farmers Increase the share of local cuisine and sustainable food in general.	Foster knowledge about local and regional producers, seasonal and ecological produce. Showcase the diverse regional cuisine, in an attempt to improve people's attitudes about it. Educate the current and the next generations of consumers about sustainable food options in terms of ingredients and recipes.
Romania / Lasi cooking studio	Educate individuals in cooking local and international dishes.	Minimize food waste, sustainable cooking. Enhance healthy and responsible cooking.	Promote sustainable food. Educate children in cooking literacy. Increase the share of local sustainable food producers.	Cooking literacy classes for children and young adults. Cooking events for charity ("Cooking for Ukraine"). Specific cooking events focused on children and teens for cooking literacy on Romanian traditional dishes.

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Türkiye / VEGAACADEMIA	Produce and share knowledge for a world that respects the right of all animals to live freely from an anti-speciesist and anti-anthropocentric perspective.	Encourage people at the individual level to become vegan and lead a vegan lifestyle. Embrace veganism holistically and practice it sustainably. Adopt veganism as an ethical issue and stance.	Seek to stop human exploitation of animals and leave the humancentric view behind as they argue for a liberation movement. Draw connections between the vegan movement and other political right-based movements, such as the feminist, ecology, and LGBTQAI+ movements in Türkiye; it takes time for the vegan issue to become politicized.	Online mechanisms to prepare, announce, and implement its training. Attend other organizations' trainings and speak at conferences.
Türkiye / BOUNVEG	Create space on the university campus for all vegans and nonvegans and students who are interested and curious about learning more about a vegan lifestyle. Raise awareness about animal rights and veganism.	Create space on campus for all vegans and nonvegans and students who are interested and curious about learning more about a vegan lifestyle. Raise awareness about animal rights and veganism.	Spread awareness about animal rights and veganism and build a supportive and inclusive community that is more caring for vegans and animals. Worked with the university cafeteria to adopt a fully vegan menu, make the vegan label official on the cafeteria contract, and add vegan options to the campus food outlets' menus.	Community-building. Animal rights activism and providing opportunities for students to contribute to these causes directly.