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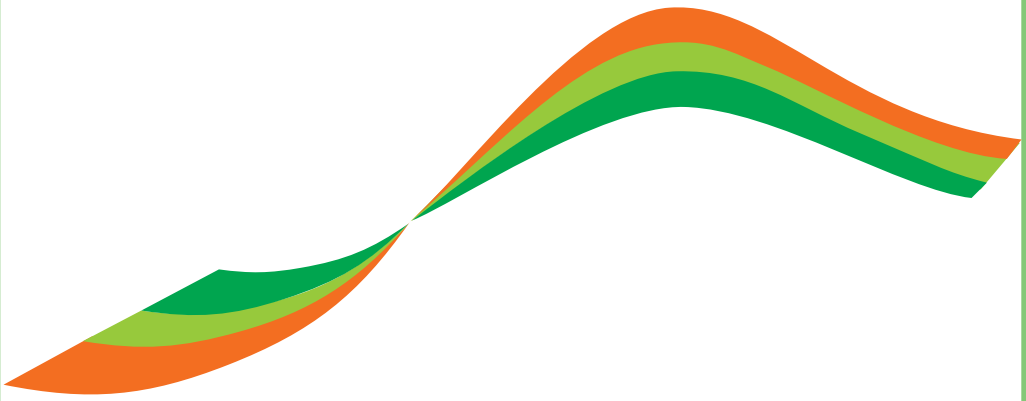

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ECONOMIA AGRO-ALIMENTARE
Food Economy

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Sommario

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Editorial for the Issue 2/2024

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We are pleased to introduce the latest issue of *Economia Agro-alimentare/ Food Economy*. This issue contains three regular articles plus one guest editorial and three articles selected for an external special issue. As always, all articles have been rigorously peer-reviewed, and are all written in English. The topics reflect a broad spectrum of contemporary challenges and innovations in the agri-food economy, covering themes such as food production, consumer behaviour, and sustainability.

The scope of the research presented spans diverse geographical areas, including Europe (Albania, Ireland, Switzerland), South America (Brazil), and Asia (Afghanistan).

The authors are affiliated with Institutions based in Albania, Brazil, Italy, Switzerland, the United Kingdom, and the USA.

As the complexity of global agri-food systems evolves, this issue brings together critical research addressing various aspects and ongoing challenges and opportunities within the sector.

In "*Reasons for Milking System Adoption: The Case of Switzerland*", Dierk Schmid explores the decision-making processes of Swiss dairy farmers regarding their milking systems. This study highlights that while reducing labor and improving flexibility are central motivators, other factors such as animal welfare and family time also play crucial roles in adopting automatic

milking systems (AMS). Schmid's work provides valuable insights into how Swiss farmers balance economic pressures with lifestyle considerations, offering important policy implications, particularly concerning investment subsidies.

Ana Beatriz Goes Maia Marques and her co-authors delve into environmental and socioeconomic sustainability within food systems in their article, "*Elements of Environmental and Socioeconomic Sustainability Related to the Food System: A Meta-Synthesis*". By analyzing case studies, the authors identify key factors that influence the transition towards more sustainable food systems. Their findings emphasize the interconnectedness of production, supply, and consumption and the importance of considering these dimensions when promoting sustainable and healthy diets. This meta-synthesis is a timely contribution to understanding the complexities of food systems as they relate to both the environment and public health.

The study "*Factors that Affect the Intention of Consumers to Buy Food Products Online*", by Eda Luga and Gentjan Mehmeti, investigates the growing trend of online food purchasing. Using structural equation modelling, the authors identify trust and risk reduction as pivotal factors in consumers' willingness to buy food products online. Conversely, performance risks remain a significant barrier. This research sheds light on the evolving consumer behaviour in Albania and provides important insights for retailers and policymakers on enhancing the online shopping experience for food products.

This issue also features a Special Issue titled "*Revisiting the Slow Food Movement: Heritage, Innovation, and Sustainability in Alternative Food Networks*", guest edited by Luca Cacciolatti, Soo Hee Lee, Giovanna Sacchi, and Jinha Lee. This collection of articles reexamines the Slow Food Movement, offering fresh insights into how heritage, innovation, and sustainability intersect within alternative food networks. The article "*Alternative Food Networks in Afghanistan: The Role of Collaborative Agribusiness in Food Security*", by Safia Amirzai and Vinh Sum Chau, explores the critical role of collaborative agribusiness in enhancing food security in Afghanistan. Matthew Pauley's work, "*A Social Practice Perspective of Ireland's Lobster Cultural Food Heritage*", delves into Ireland's lobster heritage, emphasizing how social practices shape and sustain this cultural food tradition. Finally, "*How Living Heritage Relates to Alpine Food? Evidence from the Entremont Region (Switzerland)*", authored by Maria Anna Bertolino, investigates the relationship between living heritage and food culture in the Alpine region of Switzerland, offering a fascinating look into the Entremont area's food traditions. Together, these articles provide a nuanced exploration of the Slow Food Movement's ongoing relevance and its impact on diverse food networks across the globe.

We are also pleased to announce an important transition in the leadership of *Economia Agro-alimentare/Food Economy*. The Presidential Board of the Italian Society of Agri-food Economics (SIEA) has appointed new Editors-in-Chief, Valeria Borsellino (University of Palermo, Italy) and Søren Marcus Pedersen (University of Copenhagen, Denmark), who will take over the management of the journal starting with issue 1/2025.

We are confident that their combined expertise and vision will continue to advance the journal's commitment to academic excellence and its role in fostering critical research within the agri-food sector. We welcome Valeria and Søren warmly and look forward to seeing the journal thrive under their leadership.

This issue also marks a significant milestone for the journal, as our articles from 2022 are listed in Web of Science. This achievement reflects the tireless efforts of our editorial team, reviewers, authors, and the wider community, and we are truly grateful for their ongoing support.

Lastly, we would like to sincerely thank the editorial and production staff at FrancoAngeli Edizioni, whose dedication ensures the continued excellence of our publication. We look forward to working with them in the year ahead to further the success of *Economia Agro-alimentare/Food Economy*.

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Reasons for Milking System Adoption: The Case of Switzerland

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Abstract

This paper studies the importance that farm managers attach to investment in the milking system in terms of their (management) objectives and expectations. According to a survey of 455 Swiss farm managers, the main reasons for investment decisions for all milking systems were to reduce labour and physical stress. For milking parlours, income objectives and animal welfare were more important than for other milking systems. In the case of automatic milking systems (AMS), the focus was on making working hours more flexible and increasing family time. The study shows that higher income or production volume become less important reasons over the observed time period and that AMS are implemented by older farm managers.

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Introduction

Technological adoption can be accompanied by labour efficiency improvements and optimisation aspects. In most cases, the reasons for adopting a new technology are the expectations of more profitable production (Stoneman & Kwon, 1996, Michler *et al.*, 2019). This means being able to produce the same quantity with less input or produce a larger quantity with the same input. However, other non-monetary aspects play a role in an investment decision, such as a physical and psychological reduction in workload, environmental aspects, and other organisational and institutional benefits (Bocken *et al.*, 2014, Clark *et al.*, 2015).

In Switzerland today, dairy farming accounts for around 40% of all farms, and dairy farms have a significant impact on grassland use and the production of agricultural commodities for food (Agristat, 2021; Zorn & Zimmert, 2022). With an average farm size of around 21 hectares of utilised agricultural area (FOAG, 2023), Switzerland's agriculture is characterised by small-scale farms compared to neighbouring EU countries. It receives substantial governmental support, accounting for 49% of gross farm receipts during the 2017–2019 period (OECD, 2020). The income of dairy farms remains below average compared to other farm types (Hoop *et al.*, 2021). In addition, input and output prices in the dairy sector have become more volatile over time (El Benni & Finger, 2013; Frick & Sauer, 2021; Kozak *et al.*, 2022). To remain or become more competitive by reducing costs, farmers need to adapt, including investing in new equipment. In the workflow of dairy farms, milking still occupies a large amount of time. On a farm with a milking parlour, the proportion of labour spent on milking can be around 30%. Investing in milking systems that are more expensive but require less labour is therefore a very important decision for dairy farmers in the long term (Gallardo & Sauer, 2018).

Recent studies on the motivations for investment in milking technology have used surveys and focused mainly on the latest investments in automatic milking systems (AMS) compared to conventional milking systems. Hogeveen *et al.* (2004) found that for Dutch farmers, in addition to organisational, procedural reasons were the most relevant motivations for investing in an AMS: less (heavy) work, the possibility of milking cows more than twice a day, the departure of an employee, and the need for a new milking system. The findings of Moyes *et al.* (2014) are similar, with improved herd management and better management of family time being the most influential reasons for considering switching to an AMS. In the context of Norwegian farmers with AMS, Hansen (2015) found that the main reasons for investing in AMS are increased flexibility, reduced workload, and AMS' potential to enable a more modern lifestyle. Vik *et al.* (2019) reported that

most motives are related to working conditions and quality of life rather than economic reasons. In addition, a better quality of life for the farm household was also noted, as farmers can easily more participate in social activities outside the farm and be more available to their families. In a study of large dairy farms in the USA, Lage (2024) reports that the main reasons for choosing the system were to reduce labour costs, improve cow welfare and increase milk production.

The heterogeneity of the results of the studies indicates the importance of the issue. However, two aspects have received little attention. Firstly, recent studies have predominantly focused on the most modern milking systems, neglecting the diversity of milking systems in use. Secondly, the potential evolution of the reasons over time has not yet been investigated. Additionally, no such study has been carried out within the Swiss context, with small farms and specific topographical conditions for technology use, ranging from lowland to mountainous areas. Given this premise, the following questions arise: What importance do farm managers attach to investment in the milking system in terms of their (management) objectives and expectations in the Swiss context? Are there common objectives for all milking systems, or are there specific objectives suited for one type of milking system? Are the objectives subject to a trend? The aim of the study is to address these questions and provide insight into which milking system is best suited to the farmers' objective structure. This also can help policymakers, particularly in structuring investment subsidies in the agricultural sector. The remainder of the paper is structured as follows. Section 2 deals with the data and the methods used. Section 3 presents the descriptive and empirical results, and Section 4 concludes with a discussion of the results and their context within the literature.

1. Materials and methods

There are two farm accountancy datasets in Switzerland (Renner et al., 2019) one that focuses on monitoring the income situation and the farm management sample, which includes more detailed data at the product branch level, in addition to the standard accounting variables in the usual FADN dataset. This study uses the second, more detailed dataset. The dataset contains annual data on about 1600 farms (accounting year 2020) with different farm types from three regions. The data comprise detailed monetary figures and structural information, such as information on labour, land, animals, or farming systems, but no details on machinery, equipment, or buildings. To collect data on the milking system and on the importance of their investment goals, an additional survey was integrated into the normal

survey process and sent to all specialised dairy farms participating in the 2021 Farm Management Sample for the accounting period of 2020. Eighty percent of the recipients (approx. 600) answered the survey, and after a consistency check on the milking system, milking units, and barn, data from 455 farms were used for the analysis. This included 214 farms with a bucket and pipeline milking system (BPMS), 217 farms with a parlour milking system (PMS), and 24 farms with an AMS.

A three-point scale (main objective, secondary objective, and no objective) was used to answer pre-determined questions about the importance of investment objectives in the milking system at the time of investment. At least one reason had to be completed. Additionally, the survey asked when the farm had invested in the current milking system. Three types of analysis are performed: (i) group comparisons, (ii) correlation assessments, and (iii) logit modelling. Differences in structural and economic farm characteristics between the groups (milking system) were determined using statistical tests (Wilcoxon rank sum test or chi-square test). A correlation analysis was carried out to determine the relationship between the importance of the reasons for investment (e.g. improvement of working hours) and the milking systems. To analyse the evolution of the reasons for investment, the relationship between each objective and its importance and the year of investment or the age of the farm manager at the time of investment was estimated using a logit regression. A logit regression is a statistical technique for modelling a dichotomous dependent variable and predicting a categorical outcome. The relationship between the dependent variable and one or more independent variables in a logistic regression is modelled using the logistic function, which ensures that the outcome lies between 0 and 1 (Hosmer Jr *et al.*, 2013). In our model, the dependent variables are the stated reasons for the investment and whether it is a main objective, a secondary objective or no objective (for each: yes or no). The independent variables are the year of investment or the age of the farm manager at the time of investment and other covariates. The age of the farm manager at the time of the investment reflects the situation at that time better than the age of the farm manager at the time of the survey, as the farms invested at different times. Farms with inconsistent values for the age of the farm manager at the time of investment and farms that invested before 1991 were excluded from this analysis, leaving 361 farms in the sample.

In order to find the best model, four models were constructed for each investment reason that differed in terms of the interaction and a quadratic term. This resulted in the following models with variations: Without interaction:

(1a) $$Y_{iy} = b_{0iy} + b_{1iy}x_1 + b_{2iy}x_2 + b_{3iy}x_3 + e_{iy}$$

Complemented by the quadratic term:

(1b) $$Y_{iy} = b_{0iy} + b_{1iy}x_1 + b\ \ x^{\,2} + b_{2iy}x_2 + b_{3iy}x_3 + e_{iy}$$

With interaction:

(2a) $$Y_{iy} = b_{0iy} + b_{1iy}x_1 + b_{2iy}x_2 + b_{3iy}x_3 + b_{12iy}x_1x_2 + b_{13iy}x_1x_3 + e_{iy}$$

Complemented by the quadratic term:

(2b) $$Y_{iy} = b_{0iy} + b_{1iy}x_1 + b\ \ x^{\,2} + b_{2iy}x_2 + b_{3iy}x_3 + b_{12iy}x_1x_2 + b_{13iy}x_1x_3 + e_{iy}$$

With x_1 = investment year or age farm manager in investment year, x_2 = PMS milking system (dummy), x_3 = AMS milking system (dummy), i = reasons for investment (e.g. increase in income), y = type of objective (Main, secondary, no objective. In the form of a dichotomous variable, with y=1 if yes and y = 0 if "no" for each case) and the error term e.

To the end, a total of 240 (10x3x2x4) regressions were carried out for all combinations of the objectives and their binary values of importance (main yes/no, secondary yes/no, no objective yes/no), the two independent variables and all model variants. For each dependent variable the most informative model was selected based on the Akaike information criterion (AIC) which is calculated based on the number of independent variables in the model and the maximum likelihood estimate of the model. The optimal model according to AIC is the one that explains the greatest amount of variation while minimizing the number of independent variables (Bozdogan, 1987).

2. Results

Table 1 - Descriptive statistics of the three milking system groups in 2020 in the valley, hill, and mountainous regions. Mean values, standard deviation in brackets

Region	**Valley**			**Hill**		**Mountain**	
Milking system	**BPMS**	**PMS**	**AMS**	**BPMS**	**PMS**	**BPMS**	**PMS**
Farms (n)	44	86	15	86	85	84	46
Farm structure							
Organic farming system (%)	14 (35)	7 (26)	0 (0)	9^{2*} (29)	26^{1*} (44)	25 (44)	37 (49)
Year of investment in the milking system	$1999^{2***,3***}$ (10)	$2004^{1***,3***}$ (7)	$2016^{1***,2***}$ (3)	2003 (10)	2006 (8)	2003^{2**} (10)	2009^{1**} (8)

Region	Valley			Hill		Mountain	
Milking system	**BPMS**	**PMS**	**AMS**	**BPMS**	**PMS**	**BPMS**	**PMS**
Paid labour input (AWU)	0.46[2*] (0.5)	0.75[1*] (0.7)	0.42 (0.6)	0.39[2***] (0.6)	0.66[1***] (0.7)	0.26[2***] (0.4)	0.53[1***] (0.5)
Age of farm manager	50 (10)	47 (10)	48 (8)	49 (9)	47 (10)	46 (11)	46 (11)
Age of farm manager at the time of investment	37 (14)	343[***] (11)	44[2***] (9)	36 (12)	36 (10)	38 (15)	38 (12)
Utilised agricultural area (UAA) (ha)	26.54[2***,3***] (12.95)	30.23[1**] (10.15)	40.19[1***] (17.39)	20.36[2***] (9.08)	26.91[1***] (13.79)	24.13[2**] (11.33)	30.12[1**] (14.29)
Silage maize (ha)	2.16[3***] (0.06)	3.1[3**] (0.08)	6.46[1***,2**] (0.1)	0.33 (0.03)	0.71 (0.05)	0 (0.01)	0 (0.01)
Total livestock units (LU)	34.74[2***,3***] (13.63)	51.69[1***,3***] (18.85)	74.19[1***,2***] (30.1)	30.82[2***] (13.09)	45.33[1***] (25.59)	25.65[2***] (11.26)	35.30[1***] (16.11)
Dairy cows (LU)	26.81[2***,3***] (9.63)	43.00[1***,3**] (15.03)	61.59[1***,2**] (24.81)	22.13[2***] (7.2)	31.90[1***] (14.12)	17.91[2***] (7.24)	24.04[1***] (9.3)
Animal stocking (LU/ha)	1.31[2***,3**] (0.42)	1.71[1***] (0.51)	1.85[1**] (1.17)	1.51 (0.74)	1.68 (1.13)	1.06 (0.43)	1.17 (0.5)
Livestock per labour input (LU/AWU)	16.86[2***,3***] (5.3)	22.73[1***,3***] (8.46)	35.55[1***,2***] (20.93)	17.18[2*] (10.33)	20.62[1*] (8.75)	14.17[2*] (6.53)	17.02[1*] (9.29)
Milk yield (kg percow and year)	7,455[3**] (1,434)	7,899[3**] (1,311)	8,845[1**,2**] (1,514)	6,797 (1,116)	7,008 (1,244)	6,486 (1,447)	6,757 (1,386)
Family farm income per familywork unit (CHF/FWU)	47,758[2***,3**] (28,054)	68,740[1***] (37,418)	75,572[1**] (46,223)	45,139 (29,208)	57,639 (35,306)	35,233[2**] (21,247)	44,081[1**] (20,065)

[1] Compared to BPMS; [2] Compared to PMS; [3] Compared to AMS; Signif. levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

As the farm structures in the regions are very different, the descriptive statistics are presented per milking system and region. There were no significant differences between the farm groups in terms of the absolute number of own and hired labour and the age of the farm manager. One of the biggest differences between the groups was the size of the farms, both in terms of land and the number of livestock. Farms with BPMS were the smallest, followed by those with PMS. Farms with AMS were the largest. The number of animals (animals per UAA) was higher on the AMS and PMS farms than on the BPMS farms. AMS farms had the highest number of

animals per labour input, with about 36 LSU per AWU, followed by parlour farms with about 23 LSU per AWU and farms with BPMS with about 17 LSU per AWU. Milk yield was highest on AMS farms, with 8800 kg/dairy cow per year, followed by PMS and BPMS farms, with an average of 7900 and 7500 kg/dairy cow per year, respectively. The number of animals per hectare and the proportion of silage maize were higher on AMS farms than on farms with the other milking systems. Labour income differed between farms with BPMS and farms with the other two milking systems.

Figure 1 - Relative number of farms with investments per milking system grouped by period of investment and region (Sample Size 456 Farms)

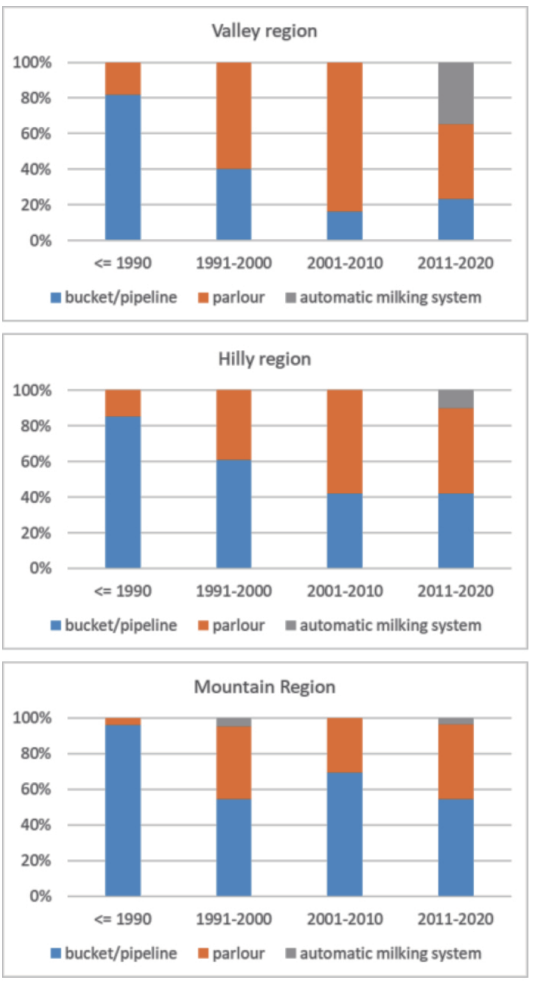

Table 2 - Relative frequencies of objectives for investing in a milking system

Milking system	**BPMS**			**PMS**			**AMS**		
Farms (n)	**214**			**217**			**24**		
objective	**main**	**secondary**	**no**	**main**	**secondary**	**no**	**main**	**secondary**	**no**
Reduce labour input	72.05	17.72	6.69	80.59	16.03	2.95	92.00	4.00	–
Reduce physical strain	71.26	15.75[2**]	9.45[2**]	69.62	25.74[1**]	4.22[1**]	64.00	32.00	–
Improve working hours	32.68[2**,3***]	39.76	23.23[2***]	43.04[1**,3***]	40.51[3**]	15.61[1***]	80.00[1***,2***]	16.00[2**]	–
Improve of animal welfare	28.74[2***]	30.31	34.25[2***]	55.7[1***]	33.33	10.13[1***]	36.00	44.00	16.00
Increase farm income per family work unit	25.98[2***]	34.65	33.86[2***]	43.04[1***]	43.88	11.81[1***]	20.00	56.00	20.00
Increase farm size/production volume	20.08[2***]	35.83	39.37[2***]	42.62[1***]	35.02	20.68[1***]	32.00	44.00	20.00
Achieve more/better family time	18.9[3***]	35.83[2**]	37.8[2***]	20.25[3**]	51.05[1**]	25.74[1***]	44.00[1***,2**]	44.00	8.00
Increase farm income	21.65[2***]	36.22	35.43[2***]	40.51[1***,3**]	41.35	16.88[1***]	16.00[2*]	60.00	20.00
Improve herd management	13.78[2***,3***]	27.56[2***]	51.57[2***]	25.32[1***]	46.41[1]	26.58[1***]	36.00[1***]	36.00	24.00
Make the farm more attractive to successors	13.39[2**]	27.17[2**]	52.36[2***]	21.1[1**]	39.24[1**]	36.29[1***,3***]	8.00	20.00	68.00[2***]

[1] Compared to PMS; [2] Compared to PMS; [3] Compared to AMS; Signif. levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The order of the objectives corresponds to their average importance.
Source: Own calculations

The survey asked when the farm had invested in the milking technology currently available. Figure 1 shows how many farms in the 2021 sample invested in a particular milking system in different periods and regions. Prior to 1990, BPMS was clearly dominant in all regions. From the 1990s onwards, investments in milking parlours predominated in the valley region. In the first decade of the 2000s, there was a sharp decline in investment in BPMS. In the mountain region, farm managers invested more frequently in milking parlours from the 2000s onwards. However, investment in BPMS was maintained at the level of the last three decades. In the mountain region, investments in BPMS remained predominant (with 55% of all investments in 2011– 2020). However, investments in milking parlours steadily increased and accounted for about 40% of all investments in the last decade. Investments in AMS were made only in the last decade of the surveyed period. In particular, farms in the valley region invested in these milking systems. They are rarely used in hilly and mountainous regions.

Table 3 - Correlation between investment goals and milking system

Correlation			
	BPMS	**PMS**	**AMS**
Farms (n)	214	217	24
Reduce labour input	–0.08*	0.04	0.10**
Reduce physical strain	0.03	–0.02	–0.01
Improve working hours	–0.17***	0.07	0.21***
Improve animal welfare	–0.31***	0.31***	0.00
Increase farm income per family work unit	–0.24***	0.26***	–0.04
Increase farm size/production volume	–0.28***	0.26***	0.04
Achieve more/better family time	–0.17***	0.10**	0.16***
Increase farm income	–0.23***	0.24***	–0.02
Improve herd management	–0.29***	0.24***	0.10**
Make the farm more attractive to successors	–0.17***	0.22***	–0.10**

3 = main goal, 2 = secondary goal, 1 = no goal
* significant at $p < 0.10$.
** significant at $p < 0.05$.
*** significant at $p < 0.01$.
spearman

Source: Own calculations. The order of the objectives corresponds to their average importance.

Table 2 shows the relative frequency of objectives when investing in a milking system, and Table 3 shows the results of the correlation analysis with the level of investment objectives and the three milking systems. For each investment objective both results are described below. The objective of reducing labour had the greatest importance across all milking systems (average 2.7). Significant differences were observed between milking systems. For the investment in farms with AMS the goal of reducing labour input was by far the most frequently mentioned reason (92%). For the milking parlour, it was 80%, and for BPMS, it remained 70%. Reducing the physical workload was, overall, very important. This was equally true for each of the milking systems, with about 70% of the responses each, or an average importance of 2.6. The objective of improving working time ranked third. It had a positive correlation for farms with AMS and was the most frequently mentioned main objective, with 80% of all statements. When investing in a milking parlour or a BPMS, this objective had a negative correlation and was significantly lower, with 40% and 32% of all responses, respectively. A similar picture emerged for the objective of improving animal welfare. On average, it ranked fourth. It was negatively correlated with BPMS farms and positively correlated with PMS farms. Among the main objectives, it was less important on farms with BPMS (29%) than on farms with milking parlours. However, 56% of all farms with a milking parlour had it as their main objective. The results for the income and labour income targets were similar for each of the milking systems. For farms with BPMS, there was a negative correlation with the income objective; for farms with PMS, there was a positive correlation; and for farms with AMS, there was no significant correlation. Improving income is not a main objective for most farms when investing in a milking system. Farms that have invested in a milking parlour (41%) gave this objective the highest priority. For farms with BPMS or AMS, the importance as a main objective was significantly lower, but as a secondary objective, it was the highest, at around 60%. Considering the main and secondary objectives together, the proportion of farms with a milking parlour that reported improving income as an objective of the investment in the milking system was highest, at over 80%. Increasing farm size or production volume is in the middle of the range of importance. This objective is particularly important for farms that have invested in milking parlours and AMS. About 40% and 30% of all respondents mentioned it as their main objective, while over 70% mentioned it as their main and secondary objective. It was positively correlated with PMS and negatively correlated with BPMS. The objective of achieving more or better family time with the investment in a milking system was ranked seventh but was more important for the AMS farms (at 44%) than for the farms with other milking systems. This was also reflected in the stronger positive correlation for farms with AMS compared to farms with PMS and the negative correlation for farms with BPMS. There was no

difference in the main objective between farms with parlour and BPMS, with about 20% of the farms. However, as a secondary objective, it was mentioned more frequently by farms with PMS (about 50% of all farms) than by farms with BPMS. Regarding the objective of improving herd management, farms with BPMS differ from those with PMS or AMS. For the latter two, it was more important as a main or secondary objective, with about 70% of all mentions, than for BPMS, with 40%. This was confirmed by the positive correlation between the objective and farms with PMS or AMS. Making the farm more attractive to successors through the investment in a milking system was least important for farms with any of the milking systems. It decreased from parlour farms (20%) to farms with BPMS (13%) to farms with AMS (8%). The objective was positively correlated with PMS farms and negatively correlated with BPMS and AMS farms. Across all milking systems, the focus of the farm objectives was on reducing labour input and physical stress. Farms with BPMS did not have any other major objectives for the investment. For farms with PMS, the main objectives were to increase the size of the farm, increase income, and improve animal welfare. For farms with AMS, the main objective was to improve working time and family time.

The results of a regression between the year of investment and the age of the farm manager at the time of investment showed that the age of farm managers increased when they invested in the milking system. Farm managers who invested in 2005 were on average 37 years old. Farm managers who invested in 2020 were 45 years old. In the case of an AMS, the age of the farm manager at the time of investment was around 7 years higher than for the other two milking systems.

Table 4 shows the results of the logit regressions for the reasons for investment and their farmer managers' weighting, depending on the year of investment and the age of the farm manager at the time of investment. For the sake of clarity, the results for the milking systems are shown only where they have a relevant impact on the results. For the objectives of reducing labour input, improving working hours, reducing physical strain, and improving animal welfare, a correlation with the age of the farm manager at the time of investment and the time of investment was unlikely. There were differences in the objectives of increasing farm income, increasing farm income per family work unit, and increasing the farm size/production volume with regard to the age of the farm manager at the time of investment and the time of investment. There was a negative trend for the main objectives and a positive trend for 'no objective'. The older the farm manager and the younger the investment, the less important these objectives were. However, for the age of the farm manager at the time of investment, a negative correlation for the main objective was only very likely for farms with PMS. For the secondary objective, there was a positive effect for farms with PMS.

Table 4 - Marginal effects (difference in probability) of a one-year increase in the age of the manager at the time of investment on the investment objectives and of a one-year increase in the year of investment on the investment objectives

	Age of the farm manager at the time of investment			Year of investment		
Goal/Objective	**Main**	**Secondary**	**No goal**	**Main**	**Secondary**	**No goal**
Reduce labour input	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Reduce physical strain	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Improve working hours	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Improve animalwelfare	At 20 years: +6.5%, At 60 years –17.5% Turning point: 30 years	n.s.	n.s.	n.s.	+3%	n.s.
Increase farm income per family work unit	–4%	–4%, +6.0% (PMS)	+6.6%	n.s.	n.s.	+3.4%
Increase farm size/ production volume	–4%	n.s.	+3.7%	Year 1990: –34%, Year 2020: –82%. Turning point: year 1906	n.s.	+4.7%
Achieve more/better family time	n.s.	+5.4% (PMS)	+2.3%	–7% (PMS), +52% (AMS)	–49% (AMS)	+3.4%
Increase farm income	–8% (PMS)	–6%, +8.4% (PMS)	+5.7%	n.s.	n.s.	+4.4%
Improve herdmanagement	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Make farm more attractive to successors	At 20 years –16.9%, At 60 years + 15.1%. Turning point: 41 years	n.s.	At 20 years: +13.1%, At 60 years: –18.9% Turning point: 37 years	n.s.	n.s.	n.s.

In brackets: Only for one milking system. Sample Size: 361 farms. The order of the objectives corresponds to their average importance. Not significant n.s.
Source: Own calculations.

In most cases, the probability of quadratic effects for these three objectives was very low. In the case of the objective of increasing the farm size or production volume, a quadratic trend was very likely for the investment year, with decreasing importance. The older a farm manager was at the time of the investment and the younger the investment, the higher the probability that achieving more family time was not an objective. However, for farms with AMS, the probability of having a main objective increased strongly (+52%) when the investment year increased by one, and decreased by 7% for farms with PMS. For farms with PMS, the probability of the secondary objective increased by 5.4% when the age of the manager at the time of the investment increased by one year.

The probability that improving animal welfare was a main objective was positive for younger farm managers at the time of investment, up to around 30 years of age (in this range, one year increased the probability of this). After that, the probability decreases again (in this range, one year decreases the probability in favour of animal welfare). For the year of the investment, an additional year reduces the probability of choosing "no goal" by more than 50 percent.

Making the farm more attractive to successors had no relationship with the year of investment in the milking system. However, the age of the farm manager at the time of the investment showed a quadratic trend in the reason categories. For the main objective, the probability of being selected decreased by one year, up to an age of about 41 years. After that, the probability increased again. If this objective were not a goal, the trend was almost exactly the opposite.

Discussion and Conclusions

The present study was the first to provide empirical results on the objectives of investments in the most common milking systems of specialised dairy farms in Switzerland. For a better understanding, these results are complemented by presenting the historical and regional distribution of the three different milking systems. Despite a downward trend, investments are still being made in "old" milking systems. Therefore, it is advantageous to take these milking systems into account when examining the motivations of investments. This makes the results more accurate and meaningful for the current situation.

In the valley and hill regions of Switzerland, the move towards more modern milking systems is progressing, and even in the mountain region, several farms in the sample already have milking parlours. These systems offer advantages in terms of labour productivity and can handle a larger

number of animals per labour input. However, the share of investment in BPMS is still quite high in the mountain region as well as in the hill region. Adherence to the BPMS is probably due to the structural conditions, which do not allow for investment and farm expansion and perhaps, to some extent, the tendency of farm managers to use more traditional construction methods. Where farm expansion is not possible, conversions tend not to involve investment in a different milking system. The large number of investment reasons negatively correlated with BPMS suggests that an investment in BPMS is more likely to be an identical replacement of the previous technology rather than a switch to a different level of technology, i.e. from milking by hand to BPMS. AMS are increasingly used on larger farms in the valley region. The fact that the profitability threshold of AMS is only reached on larger herds (from about 60 LSU) (Gazzarin & Nydegger, 2014) is probably also the reason for the lower spread of AMS in the hill region. Herd management and animal welfare goals were also related to the type of housing and could be achieved with both AMS and PMS. The individual needs of the animals are no worse met in AMS than in parlours, provided that various management measures are observed (Gygax *et al.*, 2006). The present study also indirectly examined the housing system, as this is usually linked to the milking system. It is not surprising that among the original objectives for investment in the milking system as a whole, reducing labour input and gaining physical labour relief were mentioned most frequently. Similarly, working hours were expected to improve. The use of technology otherwise makes heavy work easier while increasing productivity.

The objective of improving animal welfare was on par with the objective of improving labour income and close to the objective of increasing production volume. This is probably related to the fact that the investments are usually related to a new stable or a stable conversion, where animal welfare is now also a consideration. The objective of making the farm more attractive to successors showed a lower priority, presumably because the investments were more likely to be made at the beginning of the new generation on the farm.

The target of increasing income was only a secondary objective for a higher proportion of AMS farms, although in reality, they are among the best in this respect. Perhaps the surveyed farms were already earning well, and other objectives were more important. Investment in a more modern milking system was often associated with the goal of increasing farm size. Larger farms tend to have higher incomes per family worker. The results regarding the reasons for investing in AMS are essentially in line with those of existing studies (Hansen, 2015; Hogeveen *et al.*, 2004; Moyes *et al.*, 2014; Vik *et al.*, 2019). The main reasons are not so much economic but more flexibility and time for the family, as well as improved herd management. Achieving more

flexible family time showed a trend in importance, increasing from farms with BPMS to those with PMS and then AMS. On farms with AMS, this was the most important objective after replacing labour with technology (capital). On the one hand, an AMS allows a farm to reduce time- bound work, which can lead to more flexibility and more time for the family. On the other hand, the above-average size of AMS farms indicates that they use the labour capacity released by the milking robot in agriculture, for example, for more animals. The farm size effect leads to good economic indicators for AMS farms. The objectives of flexibility and freedom in the use of labour by the farm manager's family can only be achieved economically with AMS on larger farms. Despite relief from physical labour and the flexibility of working hours, farms with AMS have to cope with a high (mental) workload. In addition, it can be assumed that the demands on farm organisation will change but not decrease (Martin *et al.*, 2022).

While the evolution of the investment objective of improving family time towards greater importance only occurs on farms with AMS, the other developments can be observed in all milking systems. Income and growth objectives become less important over time. There is no access to the time series of these farms. Therefore, the background is analysed from the following perspectives. On average, dairy farms have become larger and have higher incomes over this period. The size of the farm may therefore dampen the desire to increase income when sufficient income is available. The results show that the age of the farm manager at the time of the investment increases by about 7 years over time. This is broadly in line with the general trend in Swiss agriculture. The average age of farm managers increased by 5 years between 2000 and 2018 (Zorn, 2020). A link with age is conceivable in the sense that older farmers also earn higher incomes or manage larger farms. Finally, there may have been a general change in values with regard to income.

Animal welfare was important to younger farm managers at the time of investment. However, it is possible that over the course of a farm manager's life, they may change their minds about the welfare reasons for the investment decision, as it was less important to older farm managers at the time of the investment. It is also possible that older farm managers have already given sufficient priority to animal welfare on farms. Conversely, depending on the age of the farm manager at the time of the investment, the aim was to making the farm more attractive to successors. For investment in milk systems made later in the life cycle, the well-being of the successor was more likely to be taken into account, whereas for investments made earlier, this was not the case.

The study has shown that there are common objectives for all milking systems, such as reducing labour and physical stress, and objectives that are better pursued with one milking system or another, resulting in a

milking system-specific trend. The objectives associated with PMS are farm expansion and increased income. The objectives that can be pursued with an AMS are improving working hours and increasing or improving family time, and secondarily, increasing income.

The objectives that are typical for the three types of milking systems provide a valuable basis both for individual investment decisions and for policy design, particularly in the area of investment aid. But the results of this study emphasise that there can be dynamic processes behind the objectives that influence their relevance over time. These dynamics must be taken into account when developing long-term investment strategies and policy measures. This paper complements the existing literature by showing that investment motivations in the Swiss context are in line with those in other countries. The results of this study expand the findings to the Swiss context with regard to the milking systems currently in use and in terms of evolving investment objectives.

The limitations of the study lie in the survey of farmers, which may lead to bias in the results. Firstly, the length of time that has elapsed since the investment varies. The longer the period, the more likely it is that the respondent does not remember correctly or does not know the context of former decisions. Secondly, as only closed questions were used, there may be other reasons for the investment that were not taken into account in the study. Finally, due to sample size, the results should be interpreted with caution. The changing reasons for investment in dairy farming in relation to the institutional environment and the individual situation of farmers could be explored in more detail in future research.

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Elements of Environmental and Socioeconomic Sustainability Related to the Food System: A Meta-Synthesis

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Abstract

This study aims to understand how the individual elements of the food system relate to sustainability through a meta-synthesis. Changes in food production and consumption in recent decades have had a detrimental effect on human health and the environment. This study helps to explain the existing gap that affects the entire process from food production to the final consumer by discussing the elements that comprise the food system dimensions of a healthy and sustainable diet. The meta-synthesis approach makes it possible to capture elements and their relationship to each other and to generate explanations about theoretical relationships. With this in mind, searches were conducted in the Scopus database, initially selecting 1,362 studies that contained previously selected search descriptors. Subsequently, an exploratory analysis of the titles and abstracts of the articles was conducted, resulting in a set of twenty case studies centered on the topic of interest. After applying inclusion and exclusion criteria, twelve studies remained to make up this meta-synthesis. The elements that emerged from the analytical synthesis of the articles favor or hinder the transition to healthy and sustainable food systems and have an impact on four dimensions: Production, supply,

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marketing and consumption, as well as on the food system as a whole. As a theoretical contribution, this study explains the elements and stressors of sustainable food systems. As a practical contribution, based on these stressors, action plans can be developed involving different stakeholders and public policies to develop public policies that promote healthy and sustainable diets.

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Introduction

The changes in the technical basis of agriculture since the 1950s, which took place during the so-called "Green Revolution", aimed to innovate agricultural practices through the use of genetically modified seeds, chemical inputs and mechanization. These changes led to the industrialization and modernization of agriculture and thus to an increase in productivity (Graziano da Silva, 2003). However, this modernization also led to environmental impacts (Coupe & Lewins, 2007; Nordborg *et al.*, 2017; Tilman & Clark, 2014). Socio-economic impacts have also been observed over time, including the concentration of property, increased exploitation of rural labor, rural exodus and greater income inequality in rural areas (Graziano da Silva, 1987).

In addition to the ecological and socio-economic effects resulting from the modernization of agriculture at the production level, some authors have also identified historical and conceptual changes in food consumption patterns. According to Fischler (2018), urbanization, the industrialization of the 1950s-1960s, the professionalization of women, the rise in living standards and education levels, as well as increasing car use and access to leisure activities, have led to more and more meals being eaten outside the home. Factors such as time and convenience, which previously had no influence on the act of eating, have become fundamental factors in food choices. Other authors point to the decline in the cost of growing and producing high-calorie foods, among other factors (Weis, 2013).

There is also evidence of changes in diet, such as the increasing availability and consumption of ultra-processed foods in several countries (Scrinis & Monteiro, 2022). This change is having a direct and negative impact on human health, leading to an increase in cases of cardiovascular disease, gastrointestinal problems, obesity and cancer (Monteiro *et al.*, 2019).

In this view, it is necessary to rethink the system of food production in order to promote a change in the eating habits of the population and link them to the environment. Authors emphasize that, in the transition to sustainable, fair and healthy agri-food systems, it is important to consider

aspects such as food and nutritional security, conservation of natural capital and climate and social justice (Bilali *et al*., 2021; Galli *et al*., 2020). Moreover, the importance of food systems as a contributor to several Sustainable Development Goals (SDGs), providing solutions for each of the 17 goals, is already recognized (Hawkes & Parsons, 2019).

In order to contribute to and deepen the understanding of the elements surrounding this topic, the aim of this article is to understand how the individual elements of the food system relate to sustainability by using the meta-synthesis method. This approach allows us to understand the relationships between the elements of each of the selected studies by analyzing the qualitative studies in depth. Furthermore, it enables the creation of a new and extended explanation for the analyzed phenomenon (Hoon, 2013), thus contributing to the theories on this topic.

It is worth noting that the study helps to explain the gap between food production and its arrival at the final consumer by discussing elements, including dimensions of the food system, to achieve a healthy and sustainable diet.

1. Background

This section presents the background with the themes that support this study. It is organized according to the following sub-themes: The concept of sustainable development and changes in the food system and their impacts.

The concept of sustainable development

Sustainable development, which has been on the global agenda for practically the entire second half of the 20th century and the beginning of the 21st century and was formulated by the United Nations in 1987, is one of humanity's greatest concerns and at the same time a constantly controversial concept. The United Nations Conference on the Human Environment in Stockholm in 1972 was the milestone that incorporated the environmental aspect into the concept of development. In 1984, the United Nations Environment Programme (UNEP) was established, which is considered an important milestone in the discussion on environmental issues (Gregolin *et al*., 2019).

Sustainable development is defined as

a development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:

the concept of "needs", in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs (WCED, 1987, p. 41).

Furthermore, the concept of sustainable development presents unique conditions that are opposed to the capitalist system, as the emergence of the idea of sustainability highlights the detrimental effects that the progress of this system has brought to the planet, especially in ecological terms. According to Vizeu *et al.* (2012), the sustainable version presupposes the possibility of increasing wealth and social prosperity without implying an increase in environmental degradation and a worsening of social injustices.

Sachs (2009) adds that sustainable development encompasses eight dimensions: social, cultural, ecological, environmental, territorial, economic, national political and international political. Gregolin *et al.* (2019) suggest that this concept also has a multidimensional character and includes social, environmental, economic, political, cultural and territorial aspects. These authors believe that the concept should encompass both rural and urban areas and emphasize the importance of the relationship between these two spaces. It is not possible to separate them or consider them as competing spaces, which is a major challenge for public decision-makers.

Changes in the food system and their impacts

The technologies used in the modernization of agriculture, which are part of the current agricultural export model, have affected the standard of production, supply, marketing and consumption of food, as well as human and animal health. These changes have impacted the planet from a social, economic and environmental perspective (Hawkes & Parsons, 2019). Therefore, the current global food system requires radical changes.

From a production perspective, the dietary habits of the population have changed, with an increase in the consumption of increasingly processed and transformed foods (Scrinis & Monteiro, 2022), which have harmful effects on the health of the population through their intake. Monteiro *et al.* (2019) point out the link between cardiovascular disease, gastrointestinal problems, obesity and cancer and the consumption of biscuits, snacks and soft drinks. In addition, Dixon & Isaacs (2013) confirm that the current diet hardly fulfils nutritional and environmental criteria.

The current food system, based on the use of technologies from the green revolution – at the production level – and an increase in supply and demand for increasingly processed food – at the consumption level – has

also affected the production chain, lengthening it and distancing the producer from the consumer. In this way, ultra-processed foods are best suited to long supply chains as they have a longer shelf life. For a transition to sustainable food systems, on the other hand, it is necessary to mobilize territorially differentiated approaches (Dubois & Carson, 2020).

In the area of supply, short chains contribute to the transition to a healthier and more sustainable food system, as they are based on proximity between producers and consumers and can therefore promote the availability of fresh and natural food (Cavalli *et al.*, 2014). In addition, measures around food supply, such as the implementation of public policies for healthy and sustainable diets (Sanz *et al.*, 2022) and the organization of institutions (Goggins, 2018), can prioritize the purchase of food from family farms and combine environmental with socio-economic aspects.

Local marketing initiatives and alternative food networks, in contrast to large supermarket chains, can in turn help to involve farmers in the markets, promote ethical values among consumers and valorize fresh food that is part of the local food culture (Mattioni & Caraher, 2018).

In terms of consumption, it is necessary to switch to a diet that integrates environmental and nutritional aspects, such as promoting a plant-based diet, increasing the consumption of fresh foods, reducing the consumption of processed foods and eliminating ultra-processed foods, as Bach-Faig *et al.* (2022) emphasize. In addition, it is necessary to implement coordinated public policies at local, state and federal levels that include healthy and sustainable diets (Sanz *et al.*, 2022; Bach-Faig *et al.*, 2022).

The transition to a healthy and sustainable food system therefore requires radical chances that include measures to solve problems in the areas of production, supply, marketing, and consumption. Studies need to be carried out to understand what these changes are and how they are interrelated, and to understand how actors in the food system influence it.

2. Methodological procedures

In order to achieve the research objective of analyzing how the individual elements of the food system relate to sustainability, this topic describes the methodological procedures used.

The methodology used for this study was the meta-synthesis of case studies proposed by Hoon (2013). Meta-synthesis aims to develop a theory that is exploratory and inductive in nature by extracting, analyzing and synthesizing primary, empirical and qualitative data. It also aims to provide contributions that go beyond the analyzed studies (Hoon, 2013). Therefore, the present study followed the eight steps proposed by Hoon (2013), which are described in Table 1.

Table 1 - Steps for the development of meta-synthesis proposed by Hoon (2013)

Steps	Objective	Process Description
1. Formulate research question	Develop a research objective or question based on existing literature	To better understand the phenomenon, searches were conducted on sustainability integrated into the food system
2. Identify relevant research	Determine keywords and identify studies that address the study objective	Descriptors were defined, and searches were conducted in the Scopus database
3. Define inclusion/ exclusion criteria	Develop clear inclusion and exclusion criteria for studies	Criteria were developed based on the research objective and quality criteria (Hoon, 2013). Inclusion/exclusion criteria are described in Table 2
4. Extract and code study data	Develop categories for coding articles based on research results	Categorization of key points of interest in the selected studies
5. Analyze results at a specific level	Identify the main contributions of each article to the research topic	A synthesis of general and specific data for each article was developed individually
6. Synthesize results	Examine possible relationships and explanations between studies	An intersection of evidence was conducted based on synthesized data
7. Develop theory from meta-synthesis	Build theoretical concepts and explanations about the theme	Construction of a broad theoretical approach contributing to the study of the theme
8. Discuss generated theory	Discuss findings based on literature and validate aspects of research rigor	Discussion on the results of meta-synthesis was conducted, and suggestions for future research were made

Source: Developed by the authors based on Hoon (2013).

The following research question was formulated to address the first step of the meta-synthesis in view of the objective of this study: How do the components of the food system relate to sustainability in a meta-synthesis?

The second step was to identify relevant research on this topic. For this purpose, Scopus was defined as a database containing important international

academic journals. An initial search was carried out using the descriptors "sustainable diet" or "sustainable nutrition" or "sustainable food" or "wholesome diet" or "wholesome nutrition" in combination with "production" or "consumption" and yielded a total of 3,621 papers. In the second and third search steps, the terms "case study" and "qualitative" were added to the above descriptors, resulting in 1,551 and 741 works respectively. The search for the keywords "healthy diet" and "healthy nutrition" yielded few results, so it was decided to replace them with "healthy diet" and "healthy nutrition". Finally, a fourth search step was carried out with the descriptors "sustainable diet" or "sustainable nutrition" or "sustainable food" or "healthy diet" and "healthy nutrition" in combination with "production" or "consumption" and "qualitative", resulting in 1,362 papers.

The keyword search was carried out as a subject search comprising abstract, title and keywords, with the exception of "qualitative", for which a full-text search was carried out. The search was only carried out in English using the Boolean operators "and" and "or" and covered the last 10 years.

The combination of keywords, suitable methodology and the topic under investigation initially resulted in 20 articles. The inclusion and exclusion criteria were defined as described in step three of Hoon (2013) and are shown in Table 2.

Table 2 - Inclusion and exclusion criteria for cases

Criteria	**Inclusion Criteria**	**Exclusion Criteria**
Qualitative Case Study	Specific criterion for meta-synthesis works, where results follow contributions from studies using the qualitative case study methodology	Studies using quantitative methodology or those not aligning with the qualitative case study approach
Thematic Relevance	Research directly linking sustainability with food (from production to consumption)	Studies not addressing the central focus of the research
Research Quality	Clear description of the case, detailed data collection and analysis, transparency criteria	Studies lacking clear descriptions of these aspects

Source: Developed by the authors (2023).

A preliminary analysis of the 20 papers was conducted, analyzing the abstracts, literature review, methodology, results and contributions of each

study. Using these criteria, paper #15 was excluded as it was not a qualitative case study. Papers #8 and #14 were excluded because they did not address the topic of this study. Papers #2, #10, #3, #18 and #20 were excluded because they did not fulfil the quality criteria for research. In total, 8 papers were excluded and the corpus analyzed consisted of 12 papers. Table 3 describes the title, the year of publication, the journal in which the article was published, and the criteria by which the articles were excluded.

Table 3 - List of pre-selected studies for meta-synthesis

Article	Title	Age	Journal	Inclusion/ Exclusion	Exclusion Criteria
#1	Sustainability as business strategy in Community supported agriculture: Social, environmental and economic benefits for producers and consumers	2018	*British Food Journal*	Inclusion	
#2	A seed towards a sustainable food system in health care institutions: the case of the Basque Country	2023	*Regional Studies, Regional Science*	Exclusion	Criteria 3 – Research Quality
#3	Contested diffusion of transformative innovations: Micro- and macrolevel social capital in South Tyrol	2023	*Sociologia Ruralis*	Inclusion	
#4	Hybrid food networks and Sustainability transitions: Shared and contested values and practices in food relocalisation and resocialisation	2023	*Sociologia Ruralis*	Inclusion	
#5	'What we'd like is a CSA in everytown.' Scaling Community supported agriculture across the UK	2022	*Journal of Rural Studies*	Inclusion	
#6	Motivations of Public Officials as Drivers of Transition to Sustainable School Food Provisioning: Insights from Avignon, France	2022	*Journal of Agricultural and Environmental Ethics*	Inclusion	

Article	Title	Age	Journal	Inclusion/ Exclusion	Exclusion Criteria
#7	Sustainable agriculture and multifunctionality in South Australia's Mid North region	2020	*Australian Geographer*	Inclusion	
#8	How does organic agriculture contribute to food security of small and holders: A case study in the North of Thailand	2018	*Cogent Food & Agriculture*	Exclusion	Criteria 2 – Thematic Relevance
#9	Consensus-building around the conceptualisation and implementation of sustainable healthy diets: a foundation for policymakers	2022	*BMC Public Health*	Inclusion	
#10	Promoting 'pro', 'low', and 'no' meat consumption in Switzerland: The role of emotions in practices	2020	*Appetite*	Exclusion	Criteria 3 – Research Quality
#11	Cutting through conflicting prescriptions: How guidelines inform "healthy and sustainable" diets in Switzerland	2018	*Appetite*	Inclusion	
#12	Moving towards ecologically sustainable diets: Lessons from an Italian box delivery scheme	2018	*International Journal of Consumer Studies*	Inclusion	
#13	European food quality schemes in everyday food consumption: Na exploration of sayings and doings through pragmatic regimes of engagement	2022	*Journal of Rural Studies*	Exclusion	Criteria 3 – Research Quality
#14	Consuming Location: The Sustainable Impact of Transformational Experiential Culinary and Wine Tourism in Chianti Italy	2022	*Sustainability*	Exclusion	Criteria 2 – Thematic Relevance

Article	Title	Age	Journal	Inclusion/ Exclusion	Exclusion Criteria
#15	Transforming Foodways: Sustainability Sensemaking Processes Among Finnish Food Companies	2022	*Ethnologia Fennica*	Exclusion	Criteria 1 – Qualitative Case Study
#16	Pillars of sustainable food experiences in the Luxury gastronomy sector: A qualitative exploration of Michelin-starred chefs' motivations	2020	*Journal of Retailing and Consumer Services*	Inclusion	
#17	Developing a sustainable food strategy for large organizations: The importance of context in shaping procurement and consumption practices	2018	*Business Strategy and the Enveronment*	Inclusion	
#18	I nudge myself: Exploring 'self-nudging' strategies to drive sustainable consumption behaviour	2017	*International Journal of Consumer Studies*	Exclusion	Criteria 3 – Research Quality
#19	Why sustainable and 'nutritionally correct' food is not on the agenda: Western Sydney, the moral arts of everyday life and public policy	2013	*Food Policy*	Inclusion	
#20	Drivers of Food Choice among Children and Caregivers in Post-earth quake Nepal	2021	*Ecology of Food and Nutrition*	Exclusion	Criteria 3 – Research Quality

Source: Developed by the authors (2023).

Step four involved extracting and coding the data from the papers. The coding was done in a text editor using the following categories: general information, introduction, literature review, context, method used, data collection, method of analysis and contributions.

In a fifth step, the results of the individual studies were analyzed and the most important contributions to the topic were identified. This was followed by a cross-analysis of the studies, which corresponds to step six and aims to

provide a comprehensive explanation of the topic under investigation. In the seventh step, a new theory is derived from the meta-synthesis and finally, in the eighth step, the results are discussed, whereby the meta-synthesis itself is explained in more detail. These steps are described in detail in the next section.

Due to the meta-synthesis method, the review is systematic, i.e. no study was identified that has Africa and South America as its research location. The theorization of this study therefore potentially takes place with a view to the Global North.

3. Analyses and results

In this section, the elements extracted from the main results of each item are presented with the aim of improving the understanding of the individually analyzed elements, which corresponds to Hoon's (2013) sixth step. Subsequently, the relationships between the elements of the selected articles were analyzed in order to find a new explanation for the analyzed phenomenon (Hoon, 2013). To this end, summaries were created for each work and then elements were extracted from these summaries. This made it possible to understand how the individual elements of the food system relate to sustainability. Table 4 shows the extracted elements.

Table 4 - Elements of the selected articles for meta-synthesis

Author (s)/Year	**Elements**
#1 Matzembacher & Meira (2018)	Strategic integration of sustainability
#3 Holtkamp (2023)	Niche actors promote transformative innovations, while regime actors hinder transformative innovations in the food system
#4 Zollet (2023)	Hybrid food networks promote the inclusion of conventional farmers through resocialization and relocalization of food, excluding organic farmers
#5 Bonfert (2022)	Expansion and socioeconomic and structural diversification of the CSA network, challenges related to financial instability, dependence on external allies, and social trends and strategies for expansion and overcoming niche status
#6 Sanz *et al*. (2022)	Changes in public officials' practices based on ethical values and changes at the federal and municipal levels

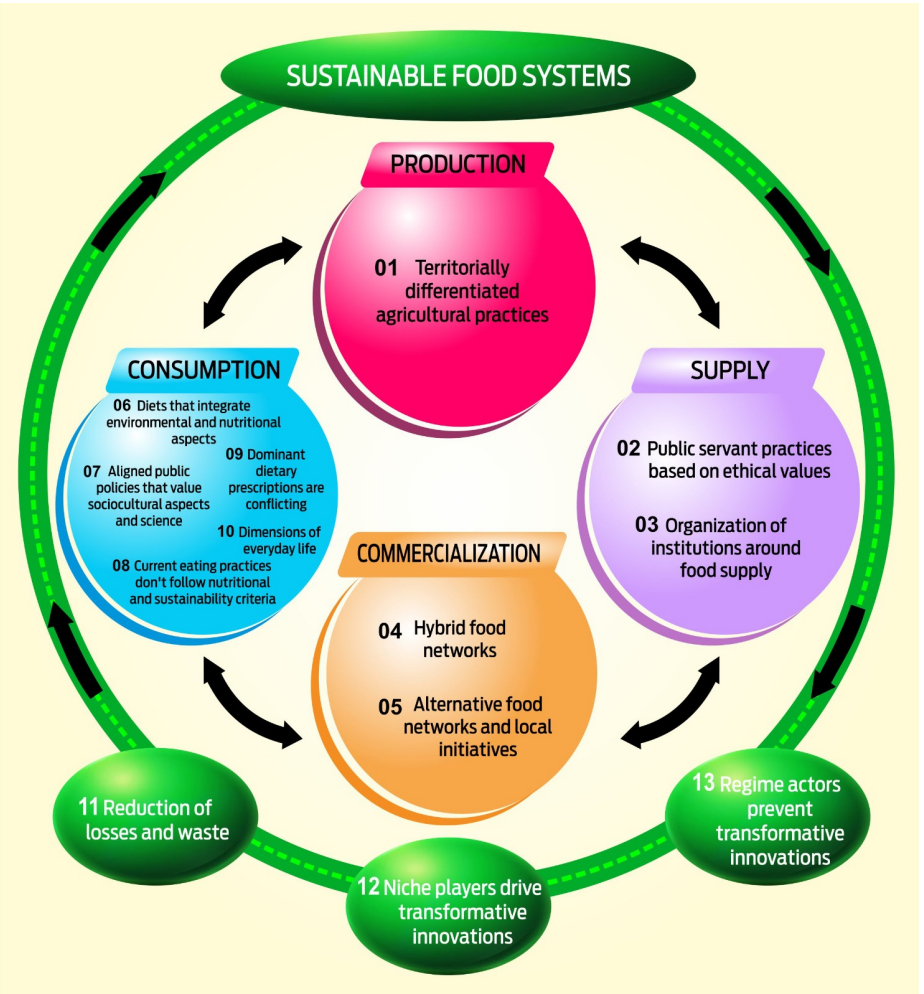
Author (s)/Year	Elements
#7 Dubois & Carson (2020)	Sustainable food transitions require the mobilization of territorially differentiated approaches
#9 Bach-Faig *et al.* (2022)	Healthier and more sustainable diets and food systems must consider scientific evidence, a shift in current dietary patterns, reduction of losses and waste, ensuring food security, and considering socioeconomic aspects
#11 Godin & Sahakian (2018)	Dominant prescriptions around healthy and sustainable diets coexist without a clear hierarchy and in tension, and everyday life dimensions can facilitate or hinder the implementation of healthy and sustainable diet prescriptions
#12 Mattioni & Caraher (2018)	Local food initiatives promote or hinder the transition to more sustainable diets
#16 Batat (2020)	Luxury gastronomy integrates sustainability actions based on intrinsic and extrinsic motivations
#17 Goggins (2018)	The primary function, size and scale, contractual agreements and food procurement practices, organizational food culture, and infrastructure of large institutions influence the supply of healthier and more sustainable foods
#19 Dixon & Isaacs (2013)	Current dietary practices often overlook nutritional and sustainability aspects

Source: Prepared by the authors (2023).

Based on the meta-synthesis produced, a theoretical framework was outlined on how the elements that permeate environmental and socio-economic sustainability influence the food system. It was found that these elements can favor or hinder the transition to healthy and sustainable food systems, in four dimensions: Production, Supply, Marketing and Consumption, and across the food system as a whole, as shown in Figure 1.

As far as food Production is concerned, achieving sustainable change in the agri-food sector requires the mobilization of territorially differentiated agricultural practices (01) that can either favor or hinder such change. Favorable aspects include: a) more conservative agricultural management practices adopted by farmers to prevent soil erosion, increase biodiversity and avoid soil and water contamination, such as Crop rotation, reduced use of fertilizers, combined crop and animal husbandry with rotational grazing, introduction of no-till farming; b) increased resource efficiency through the use of manure as an efficient substitute for chemical fertilizers, planting trees to protect springs and conserve soil moisture, conversion to organic farming;

Figure 1 - Meta-synthesis of qualitative cases



Source: Prepared by the authors (2023).
Figure Credit: Kato Digital Marketing.

and c) the role of regional actors, highlighting the importance of mobilizing and applying scientific knowledge in adapting agriculture to climate change through the coordination and funding of initiatives to promote sustainable agricultural practices, educational activities and the discussion of scientific knowledge on the subject.

However, there are also forms of land use that can hinder the transition to sustainability, such as the increase in large farms favoring monocultures, land

purchased or inherited by non-farmers, the decoupling of land management and ownership, and a low proportion of protected areas (e.g. Dubois & Carson, 2020).

In the area of food Supply, as Sanz *et al.* (2022) emphasize, the individual motivation of public servants (02) is the most important driver for the successful implementation of sustainable public food procurement policies. This motivation is driven by social justice and a sense of duty to provide children from low socioeconomic backgrounds with access to healthy food by increasing the consumption of fresh food and reducing the consumption of highly processed food.

The organization of institutions around food supply (03) can either help or hinder the achievement of healthy and sustainable diets (Goggins, 2018). Key elements include: (a) the primary function, size and scope of the institution – institutions may have high/low turnover, diverse audiences, education levels, length of stay and whether catering is an additional service, which primarily impacts on the quantity, quality and expectations of the food provided; b) contractual agreements and food procurement practices that take food sustainability into account can provide opportunities for organizations to improve their sustainability performance; c) the existence of an organizational food culture that fosters connections between consumers, organizations and the food service and educates staff on the sustainability attributes of food; and d) adequate infrastructure for sourcing, receiving and delivering healthier and more sustainable food, such as the adoption of various measures to reduce food waste. E.g. the adoption of various measures to reduce food waste, the introduction of technological innovations (e.g, temperature-controlled food trolleys) and the provision of suitable premises for food preparation and delivery of food.

In the commercialization of healthier and more sustainable food through hybrid food networks (04), conventional actors exploit ideological commonalities with alternative actors in the context of food resocialisation and relocalisation by promoting the creation of direct food sales spaces and bringing consumers and producers closer together. This proximity can be achieved by: promoting actions to deepen people's relationship with local food in order to protect local agriculture, food culture and the natural environment; creating direct sales spaces; including the producer's photo and name on each product, customizing the packaging; providing a brief description of the farm or recipe cards written by the farmers next to the product; creating certifications and brands that indicate the origin of the food and the amount of pesticides and fertilizers used (e.g. Zollet, 2023).

On the other hand, hybrid food networks promoted by conventional farmers lead to the exclusion of organic farmers, as these markets do not take into account the quality of organic food. These markets are geared towards

the purchase of local food and do not allow farmers to label their products as organic (possibly because this would constitute an element of unfair differentiation). As a result, there is a search for other marketing spaces that value organic food, leading to a displacement of these farmers, as Zollet (2023) emphasizes.

Mattioni & Caraher (2018), in turn, point out that alternative food networks and local marketing initiatives (05) are of considerable socio-economic importance for the farmers involved, as they secure income and promote regional development. Moreover, these spaces are seen as crucial in providing people with the necessary guidance for a transition to sustainability. This is done through visits to farms, seminars on food poverty, cooperative economic models and the fight against racism in agriculture, as well as through advisory programmes on how to finance the acquisition of land or to consume a particular food. However, the relative lack of access to material resources in these spaces highlights their dependence on favorable external conditions such as public attention and support from external allies. In addition, socio-economic trends such as the pandemic, which stimulated the search for food of known origin, can increase the demand for local food. On the other hand, it makes these spaces dependent on these trends.

From a food Consumption perspective, there is a need to promote a diet that integrates nutritional and environmental aspects (06), favoring a plant-based diet, reducing the consumption of processed foods, moderating portion sizes and promoting the consumption of local products.

Another element that can contribute to the sustainability of the food system in terms of consumption is a set of coordinated and coherent public policies at different levels of government (07) that develop a cross-sectoral and multidisciplinary approach. To this end, it is necessary to look for several solutions, as a single solution is not sufficient. This includes monitoring current consumption and its impact, as well as changes over time and the regulation of food prices.

In addition, these public policies must take into account socio-cultural and economic aspects, social and cultural acceptance of dietary habits, food accessibility and distributive justice as essential factors for a healthy and sustainable diet. It is emphasized that the cost of food must be taken into account in order to avoid inequalities and that specific guidelines must be drawn up for different population groups.

In this context, the need to regulate media campaigns to limit the advertising of unhealthy and unsustainable foods and promote healthy eating habits was also emphasized. Food labelling is also considered important for public policy by introducing labels that make it easier for consumers to recognize the environmental impact of food, as well as information on nutritional composition and health claims.

However, as an element hindering the transition to healthier and more sustainable food systems, Dixon & Isaacs (2013) point out that current dietary practice (08) pays little attention to aspects of nutrition and sustainability, with a high consumption of meat and its derivatives and ultra-processed foods.

In terms of dietary prescriptions for health and sustainability (09), seven have been identified by Godin & Sahakian (2018) as most dominant among prescribers and consumers, co-existing without a clear hierarchy, often in tension with each other. The first is eating for pleasure: the pleasure people should feel in preparing and sharing a meal that is part of a communal practice. Pleasure is seen as essential to a healthy diet. The second is a nutritionally balanced diet, which is seen as important for a healthy and sustainable diet. Organic and natural eating and local and seasonal eating are emphasized as overlaps between the dietary recommendations. When it comes to eating local, seasonal, organic or "natural" foods, health and sustainability are often confused: If a food is considered environmentally sustainable, eating it is also considered healthier for people in terms of health.

There is a difference between those in favor of "less and better meat consumption" and those in favor of a vegetarian and vegan diet: for those in favor of less but better meat consumption, consumers should choose quality over quantity. Eating less and better meat is presented as the answer to the health problems associated with the high consumption of red meat, but also to the potential harmfulness of antibiotics for animals as well as pesticides in their food. Reducing meat consumption is also presented as beneficial for the environment. Proponents of vegetarian and vegan diets, on the other hand, believe that killing and eating animals is wrong as they are not necessary for our survival. Finally, there are weight loss diets, where a slim body has become synonymous with a healthy body.

The dimensions of daily life (10) can both help and hinder the promotion of a healthy and sustainable diet. Buying, planning, cooking, storing and managing food requires a considerable amount of time and the acquisition of culinary skills.

Mobility and access to food influence the scenario addressed, because the way people move around on a given day affects the food they buy and where they buy it, or the decision to eat out. Even more than proximity to home, access to a shop as part of daily transit seems to be the dominant time and space in which people purchase food.

The social dynamics inside and outside the house have the following effects: Who cooks for whom and who eats with whom are areas that influence the types of meals prepared and the intentions associated with them. An adult may not pay as much attention to the flavor or quality of the

food when eating alone, but may take care to prepare a tasty and balanced meal when cooking for their family. Or parents may choose not to buy certain foods that they know their children won't eat, favoring processed foods that are considered less healthy and sustainable.

As for the socio-economic aspects, they have the effect that the more conscious consumers belong to the middle class, which shows that for lower-income socio-economic groups, the cost of a healthy and sustainable diet can be a barrier to its implementation (Godin & Sahakian, 2018).

In addition to the elements that make up these four dimensions (production, supply, marketing and consumption), three other elements were mentioned in the cases that can influence the entire food system. The first relates to the reduction of food loss and waste (11) throughout the food system, both at home and in restaurants, in production, storage and delivery logistics.

The other element concerns the promotion of transformative social innovations by (alternative) niche actors (12) with the aim of initiating sustainable change in local food systems. Raising awareness, legitimizing the movement and changing the local power structure can be done through self-organization to promote a change in the legal structure and enable citizen referendums; organizing a local referendum on the ban of pesticides; environmental and health education on the harms of pesticides; raising awareness among citizens through a protest and strengthening the legitimacy of the movement by claiming a farmer as the leader of the movement. This can be achieved by organizing a citizens' cooperative, establishing alternative food networks such as an organic farmers' market, an organic valley and a community-supported dairy to change local food consumption and production practices (Holtkamp, 2023).

On the other hand, actors in the conventional regime can hinder transformative innovations (13) and instead gradually promote innovations in their favor, as Holtkamp (2023) shows. These actors can take advantage of the existing coalition, organizational integrity and top-down connections by joining forces with other conventional producers from neighboring communities in an association and production cooperative to initiate a legal process with the aim of banning the referendum and a corresponding implementation norm for the pesticide ban. If, for historical reasons, the region has a high degree of organizational integrity within the conventional regime, which means that the majority of the population trusts the official government institutions, new regulations for the use of technological innovations to reduce pesticide drift can be enforced with the help of the government.

It is also possible that new regulations are enforced through a dialogue between government actors and regime actors to gradually encourage

innovation. For example, if the government has convinced many organic farmers involved in the movement and their association to consider the problem of pesticides as less urgent.

The production, supply, marketing and consumption of food are so interconnected that a healthy and sustainable food cannot be produced without the supply, marketing and consumption favoring these characteristics of being healthy and sustainable. In other words, for a healthy food to be produced sustainably, pass through the supply chain, be marketed and consumed, the entire food system needs to be planned in a way that favors these conditions. They are therefore inextricably linked. In Figure 1, these links are represented by arrows between the dimensions.

Based on the synthesized meta-analysis, suggestions were formulated for each stage of the food system on the path to sustainability, as shown in Table 5.

Table 5 - Propositions in the scope of food production, supply, commercialization, and consumption towards sustainability

P1 – Production: In the transition to a sustainable food system, it is necessary to consider territorial agricultural practices that reduce environmental impact, such as crop rotation, rotational grazing, no-till farming, the use of organic fertilizers, and organic production.
P2 – Supply: Ethical values-based practices of public officials engaged in environmental causes are necessary for successful implementation of sustainable food supply public procurement policies; **P3 – Supply**: The organization of institutions, through contractual agreements and appropriate infrastructure, favors the acquisition, receipt, and provision of healthier and more sustainable food.
P4 – Commercialization: Conventional actors in hybrid food networks enable the resocialization (revival of local food culture) and relocalization of food (local food marketing initiatives); **P5 – Commercialization**: Alternative food networks and local marketing initiatives promote regional development and serve as formative spaces for consumers.
P6 – Consumption: To achieve a sustainable food system, it is necessary to promote a diet that integrates nutritional and environmental aspects; coherent and aligned public policies at various levels of government that also consider sociocultural and economic aspects; **P7 – Consumption**: A set of coherent and aligned public policies at various levels of government, using a multisectoral and multidisciplinary approach and involving all sectors of different disciplines, are fundamental aspects to achieve a sustainable food system;

P8 – Consumption: Current dietary practices give little consideration to nutritional and sustainability aspects, prioritizing high consumption of meats and their derivatives and ultra-processed foods;
P9 – Consumption: Dominant dietary prescriptions on health and sustainability coexist without a clear hierarchy, often in tension with each other, hindering the transition to a sustainable food system;
P10 – Consumption: Everyday life dimensions can both contribute to and hinder the promotion of a healthy and sustainable diet.

P11 – Food System: Reducing food losses and waste is necessary in all dimensions of the food system to achieve sustainability;
P12 – Food System: To transform consumption and production practices, it is essential to encourage transformative social innovations by niche actors (alternatives) through sharing competencies, building trust among these actors and consumers, and deepening common values and beliefs;
P13 – Food System: Actors in the regime (conventional) can hinder transformative social innovations and promote gradual innovations in their favor in the transition to a sustainable food system.

Source: Prepared by the authors (2023).

The information summarized here thus supports the decision-making of public, private or civil society actors who strive for a healthy and sustainable food system for present and future generations. One aspect that has become clear is the role of local actors, who have proven to be essential in creating initiatives that promote the transformation of the food system into a healthier and more sustainable form. However, these initiatives can experience discontinuity and disruption due to actions or actors that reproduce and are part of the conventional food system. Therefore, it is emphasized that actions by the state are fundamental, such as the creation of food-related public policies, which have already proven useful in regulating the food system (Rosseti *et al*., 2016; Camargo *et al*., n.d.).

Conclusions

A meta-synthesis study was carried out with the aim of understanding how the individual elements of the food system relate to sustainability. It was hypothesized that in the transition to a sustainable food system, there may be disruptions that contribute to or hinder this transition, both in the areas of production, supply, marketing and consumption and in the food system as a whole.

Elements that influence, prevent or promote sustainability in the food system were identified as a contribution to research. Elements that influence, hinder or promote sustainability in the food system were identified as a contribution to research. Elements that hinder the transition to sustainable food systems include

i. environmentally harmful territorial agricultural practices;
ii. institutional organization hindering the acquisition, receipt, and supply of healthy and sustainable food;
iii. exclusion of organic farmers from hybrid food networks;
iv. lack of resources, dependence on external allies, and socioeconomic trends affecting alternative food networks and local marketing initiatives;
v. current dietary practices disregarding nutritional and sustainability aspects;
vi. dominant conflicting dietary prescriptions;
vii. dimensions of daily life, such as time constraints, mobility restrictions, and access to food, family concerns, and socioeconomic context; and
viii. actors in the conventional system obstructing transformative social innovations aiming for a healthy and sustainable diet.

Additionally, enabling elements for the transition to sustainable food systems also emerged in the research, including:

i. territorially differentiated sustainable agricultural practices;
ii. changes in public servants' practices based on ethical values;
iii. institutional organization supporting the acquisition, receipt, and supply of healthy and sustainable food;
iv. hybrid food networks supported by re-socialization and relocation practices implemented by conventional farmers;
v. alternative food networks and local initiatives, of significant socioeconomic importance promoting interaction between producers and consumers;
vi. the need for a diet fully integrating nutritional and environmental aspects;
vii. aligned public policies at various government levels considering sociocultural aspects and scientific evidence;
viii. dimensions of daily life, such as available time, mobility, and access to healthy and sustainable food, family care, and a favorable socioeconomic context;
ix. reduction of losses and waste; and
x. niche actors promoting transformative innovations towards healthy and sustainable diets.

It has become clear that farmers, whether conventional or organic, policy makers, public and private sector actors and consumers can all play a part

in the transition to a sustainable food system. However, it is important to emphasize the role of the state as a regulator and facilitator of public policies that promote and raise awareness of the transition to a sustainable food system.

As a theoretical contribution, this study explains the elements and drivers of the sustainable food system. As a practical contribution, it is possible to develop action plans from the tensioners that involve different stakeholders and government actions for public policy development.

In terms of developing future research, it is suggested that this phenomenon be studied in the light of interpretative approaches, such as the theory of social action (Weber [1864-1920] 2013), in which social engagement is analyzed as meaningful, which requires its understanding through the creation and determination of causal relationships that enable the interpretation of the meaning of the action.

Due to the methodological limitations of the present study, further research notes were emphasized. The first is that studies using qualitative methods that consider the Global South, including research on sustainable, fair and healthy agri-food systems in this location, could perhaps examine the reality of the Global South, as this study examines the Global North in a more accentuated way. This would be relevant as a large proportion of food production takes place there.

Secondly, since the meta-synthesis aims at a theoretical synthesis for different realities, the differences between the development models present in the case studies were not taken into account, research can be carried out to detail these differences as well as the differences between countries in the elaboration of public policies for the food system.

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Factors that Affect the Intention of Consumers to Buy Food Products Online

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Abstract

Internet purchases are no longer a new form of purchase, but they are successfully complementing conventional product sales channels. This study aims to understand factors, such as: product performance risk, distance, trust and risk reduction that affect consumer's intention to buy food products online. The following data was collected through a structured questionnaire. Confirmatory Factor Analysis was used to develop measures and Structural Equation Modelling was used to test hypotheses. The results show that trust and risk reduction have a positive effect on the consumers' intention to buy food products online. Product performance risk has a negative effect on the intention to buy food products online, meanwhile distance does not show any significance on their intention to buy food products online. These findings provide significant insights into what limits consumers to consider the online channel as a complementary alternative of shopping for food products.

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Introduction

The development of online channels has been elaborated for most of food products, but they are still at the bottom of the list in consumer preferences for online purchases. Many scholars have pointed out the slower adaptation of this channel for food products (Olumekor *et al.*, 2024). Focusing on evaluating the factors that demotivate intention of consumers to buy food products online is an issue that attracts research interest.

Due to the increase in internet usage and its invasiveness and impact, the number of people shopping online food products has proliferated (Nwaizugbo & Ifeanyichukwu, 2016; Redman, 2020; Chang & Meyerhoefer, 2021). Despite the growing popularity of online sales, the online distribution of brick-and-mortar groceries is still very high (Seidel, 2021). The coexistence of both forms of sales deserves attention to identify the factors that drive the choice of one channel over another.

Purchases of online food products in terms of factor's impact, have identified components such as the access they can create for elderly or disabled consumers (Kvalsvik, 2022), the promotion of healthy eating habits after the presence of the consumer in the store created impulse purchases from contact with the product (Pitts *et al.*, 2018), food access faced by low-income families, distance from physical stores (Trude *et al.*, 2022), the impact of income and prices on the frequency of online food purchases (Olumekor *et al.*, 2024). A second group of researchers has studied consumer's factors such as the impact of social or subjective norms, trust and perceived risk, previous shopping experiences, attitude, perceived usefulness (Gruntkowski & Martinez, 2022; Frank & Peschel, 2020). From these results, it can be noted that there were some inconsistencies in the results.

Several authors have studied online behavior for food products from the perspective of consumer motivation (Geuens *et al.*, 2003; Roberts *et al.*, 2003; Rohm & Swaminathan, 2004; Chen *et al.*, 2020; Pena-García *et al.*, 2020). Most studies list the factors that encourage consumers buying online food products over those that inhibit their behavior toward online channels. Harris *et al.* (2017), emphasize that the disadvantages of a channel can motivate the development or maintenance of consumer behavior over another distribution channel.

The aim of this study is to identify the factors which influence the consumer not to buy food products online. Selected factors are identified as: product performance risk as the inability to physically control the product attributes, risk reduction as the efforts of sellers and buyers to increase the security of online purchases, distance as distance perception between the consumer's residence and the place of purchase, and trust as the buyer's trustworthiness in the seller. The data was collected in Tirana, the capital

of Albania, with the purpose of identifying consumer trends for online purchases of food products. The study applied Structural Equation Modeling (SEM) to measure the relationship between factors and hypothesis testing (Mehmeti *et al*., 2021).

Regarding e-commerce, the Albanian market is expected to reach 1.18 million users by 2027, with user penetration up to 42.1% by 2027 (Statista, 2023). According to Lone *et al*. (2022), 38% of the Albanian population has experience in online shopping mainly in clothes and electronic products. Meanwhile, in terms of food products, the use of the online channel for this product category still remains negligible. According to Luga *et al*. (2022), the purchase of food products online in Albania is very low. Only 8.6% of the population has had experience of online shopping for food products which was driven by the COVID-19 pandemic lockdown.

This paper attempts to use the insights from the Theory of Reasoned Action (TRA), known as the Theory of Planned Behavior (TPB) to identify the impact of the factors selected as inhibitors of online shopping. The use of TPB is a successfully applied in the evaluation of consumer behavior even in the case of online shopping. (Bauerová *et al*., 2023).

The novelty of this study, in the theoretical aspect, is related to the inclusion of the distance factor in the theoretical framework. In the authors' knowledge, distance is an understudied factor and this paper aims to bring some insights about its impact on online channel adoption. Distance is analyzed as a perception and accessibility of physical markets from the consumer's residence. The short distance and easy accessibility affects the consumer perception of online shopping. Some authors (Sueland & Polak, 2018; Wieland, 2021) have studied the influence of the location of the stores in the perspective of using multiple channels simultaneously or using different purchase alternatives within the same purchase process such as "buy online pick up in store" known as "click and collect".

Another new contribution is the inclusion of product performance risk. From the literature the focus on the perception of risk is studied as a general concept, not paying attention to the perception of risk for the performance of the product itself primarily in the case of food products where the physical characteristics of the product are predominant in the consumer choice.

Also, this paper contributes to filling an existing gap in the study of online food purchases, and especially in online consumer behavior in developing countries.

In situations where 27 supermarkets in Tirana offers food products through multiple channels (Luga *et al*., 2022), this paper will provide knowledge for food retailers on investments in new marketing channels such as the online one, improving their planning marketing strategies in relation to the customer's satisfaction.

This paper is structured as follows. Section one reviews the literature on factors that influence consumer's intention to buy food products online, also in this section the study hypotheses are presented. Section two describes the materials and methods, while section three provides the results and discussion of this study. The paper ends with conclusion in section four.

1. Literature review on factors that influence the intention to buy food products online

From the perspective of consumer behavior, the literature offers different views on the evaluation of consumer intention toward online shopping for products in general and food products in particular. Although in the literature we find references to motivating factors (convenience in various types such as access, search, evaluation, transaction and possession convenience, time saving, no travel cost) (Farag *et al.*, 2007; Shi *et al.*, 2019; Hanus, 2016), however, some factors that prevent the consumer from adopting such a form of purchasing products can still be observed. According to Font-i-Furnols & Guerrero (2014) the consumer experiences uncertainty on how to act or behave from online shopping.

Some insights from TPB and the factors that affect online consumer behavior toward food products

To analyze the factors that influence the intention of the consumer to buy food products online we rely on some insights from the TPB. TPB, started as the TRA in 1980, claims that intentions are a fundamental antecedent of actual behavior (Ajzen, 1991). TPB has been used constantly to adopt attitude-behavior relationship models to explain online purchases through consumer attitudes, subjective norms and beliefs (Bauerová *et al.*, 2023). In this regard we propose to analyze product performance risk, risk reduction, distance and trust as factors that prevent consumer intention to buy food products online as consumer beliefs and attitudes. The construct between consumer behavior and buying intention is important for consumer research (Ghalandari & Norouzi, 2012). Regarding food products, purchase intention can be affected by several elements including product distribution channels (Curvelo *et al.*, 2018).

There is a uniformity of opinion about the factors that prevent online shopping for food products. Some authors focus on the analysis of the types of factors in a holistic approach such as Sivanesan *et al.*, (2017) who lists them as trust, reputation and services provided from the seller, consumer

experience, and lack of product information. Other authors analyze certain factors in detail. Gomes & Lopes (2022) reach the conclusion that consumers do not easily adapt to online shopping because they want to choose their own food to get the best quality and freshness, they want to experience satisfaction from their shopping experience in brick-and-mortar shops (Gomes & Lopes, 2022). As a matter of lifestyle many consumers see shopping in stores as an opportunity to spend time together (Hanus, 2016). Most consumers are not ready to buy food products online due to the inability to physically check the quality of the products especially regarding fresh food products (Sharma, 2015). They want to avoid the risk such as product risk, time risk, secure information risk and seller fraud risk (Ngyen *et al.*, 2021).

This paper is focused on the evaluation of consumer intention towards online purchases of food products under the influence of four factors such as: product performance risk, risk reduction, distance and trust.

Product performance risk

Willett (2016) defines risk as the uncertainty of loss, or risk that denotes the possibility of loss. Consumer behavior and intention to shop online depends primarily on the perceived features of online shopping and on the perceived risk associated with online purchase (Machado, 2006). According to Li *et al.* (2020), risk perception is an essential factor that affects how individuals assess risk, make decisions and their behavior. The degree of risk perception affects the intention to buy food products online (Ngyen *et al.*, 2021) and depends on the level of consumer involvement in online buying behavior. This higher involvement will result in a greater awareness of possible negative consequences with an impact on consumer buying online products (Mehmeti & Luga, 2021).

There are several papers related to the significant impact of perceived risk and more specifically product performance risk on consumers' online shopping attitudes, which negatively affect their purchasing behavior (Zhang & Yu, 2020; Nguyen *et al.*, 2021). Perceived risk is considered in a subjective prediction of consumer behavior (Peter & Ryan, 1976), while it is affirmed that when the consumer experiences a high level of risk perception, they tend to avoid a purchase (Mitchell, 1995).

Among all types of risk, the risk of product performance mostly affects the consumer's perception in purchasing the product online (Kim & Forsythe, 2008; Kim & Lennon, 2008) and in online environment it appears to be more present due to the fear that the product does not function or perform as expected (Almousa, 2011), or because the lack of accurate product examination (Cases, 2002; Tan, 1999). For food products,

the examination relies on the sensory characteristics such as appearance, freshness, taste, color, smell. Prescott *et al.* (2002), pointed out that food safety and health, convenience, sensory characteristics, quality, price are important determinants affecting consumer purchase of food. This leads to the fact that sensorial characteristics are essential motivating factors that drive consumers towards purchasing and consuming food products and they play a pivotal role in consumer perception, purchase decision, consumption and satisfaction towards foods (Wang *et al.*, 2015; Braghieri *et al.*, 2016; Tan *et al.*, 2017; Imtiyaz *et al.*, 2021). Most consumers are not willing to buy food products online because they are not able to physically check the quality of products, especially fresh products (Sam & Sharma, 2015) and some consumers prefer to interact directly with products and people while shopping (Van Droogenbroeck & Van Hove, 2017). Based on these findings, we propose the following hypothesis:

H1: Product performance risk negatively affect the consumers' intention to buy food products online.

Risk Reduction

Due to the risk perception, consumers rely on risk reduction strategies (Chu *et al.*, 2014). Fear of taking risks by users will increase their expectations of negative results and reducing intentions to behave. Consumers develop beliefs toward risk reduction strategies and purchase intention (Chu *et al.*, 2014). It was analyzed that beliefs are demonstrated as self-efficacy and response efficacy respectively as one's confidence to perform a recommended behavior and behavior's perceived value (Thrasher *et al.*, 2016). While efficacy belief is powerful in predicting behavior (Hichang, 2010).

According to Vos (2014) there are several risk mitigation strategies which include access control policies, physical security and remote access policies and methodologies.

Sensitivity to risk perception has led early in the literature to find that consumers may gather information from formal and informal sources, use brand image/reputation or price as a quality guide, or shop only in stores with a good image (Akaah & Korgaonkar, 1988). This was also supported as well by Mitchell & McGolddrick (1996) that assume that the risk reduction strategies include consulting with family or friends, past experiences, warranty, price information, consulting a salesperson, buying known brands, and obtaining information from advertisements.

Marketers have used tools such as money-back guarantees, warranties, and free trials to influence consumers' risk perception (Schiffman & Kanuk,

1987) and the consumer tries to find instruments to avoid the risk and create more security (Imtiyaz *et al.*, 2021).

Roselius (1971) identifies risk reduction strategies focusing in money- back guarantees, the image of brand or store, self-experience, word of mouth or relying on expensive models. The opinion of other consumers, a retailer with an established reputation, a well-established brand name, and a money-back guarantee is effective in reducing risk perception of consumers in online shopping (Tan, 1999).

The literature suggests risk reduction strategies related to purchasing products online, not specifically focused on food products. Several authors have investigated consumer attitudes towards food fraud (Liu & Niyongira, 2017; Zhu *et al.*, 2017; Kendall *et al.*, 2019) as the concept of the deliberate changes of food ingredients or its packaging for economic benefits (Spink & Moyer, 2011). Although Kendall *et al.*, (2019) studied ways to mitigate the perceived risk of food fraud, but they did not consider the online channels of purchasing the product.

In online shopping literature the concept of sensory marketing, which is defined as: "marketing that engages the senses of consumers and affects their perception, judgment and behavior" Krishna (2012), affects the attitude and purchasing behavior of consumers towards products (Hamacher & Buchkremer, 2022). According to Hamacher (2022) companies in the food industry should engage in the application of online sensory marketing index to increase the multisensory engagement of consumers from food product presentation websites on the internet. This would improve consumer perception for food products and providing a solution to the consumer's multisensory appeal. Based on these findings, we propose the following hypothesis:

H2: Risk reduction alternatives positively affect the intention of consumers to buy food products online.

Distance

Another factor that will predict consumer intention to buy product online is the distance, described as spatial shopping behavior, part of retail geography that attempts to analyze the drivers of consumer store choice (Timmermans, 1993). These theories try to explain consumer choice which develops favorable attitudes for short distances while long distances tend to be underestimated by consumers (Timmermans, 1993; Marjanen, 2001; Wieland, 2021). The distance between places is subjective and create perception depending on the degree of familiarity with the points of origin and destination. The development of a spatial image is a person's model

of objective reality (Marjanen, 2001). The physical surroundings (distance to store, access to grocery websites, crowdedness, weather, and in-store environment) are divided into geographical and institutional locations, in which the consumer choice occurs (Kvalsvik, 2022).

The access to food is an important factor that influences consumer behavior towards food, food safety and diversity of consumer choice (Kvalsvik, 2022). Food access refers to the location of the facility from which the consumer obtains food (e.g., food stores) and the ease of getting to that location (Caspi *et al*., 2012).

From 1970, geographical studies of shopping products questioned the classical theory of the central place. The theory states that shoppers will visit the nearest retail center that provides them with the goods or services. Shopping is indeed a complex process which provides much wider assortments of products. The consumer can buy in local stores or in malls. The mall attracts consumers from a large distance. This behavior that seems to be irrational expresses the individual's need for uniqueness (Marjanen, 2001). The low number and small concentration of stores and supermarkets increase the time spent by consumers to secure food products.

The traditional theory of retail location has not been included in the analysis the development of online purchases (Reigadinha *et al*., 2017). Online shopping offers the customer many options for choosing products and services, as well as the opportunity to compare them with other sellers (Sivanesan, 2017). It has been found that the likelihood of consumers engaging in online shopping is related to travel effort to reach physical stores (the less effort, the more physical stores are preferred) and delivery effort (Wieland, 2021).

It also seems that consumers who work and those who are at home spend the same amount of time, but change in the frequency of purchase and the possibility of having fresh products (Hamrick & Hopkins, 2012). The impact of residential environment and shop accessibility varies for the different stages of the internet shopping process and for the type of product (Farag *et al*., 2006).

According to Kvalsvik (2022) the distance from the nearest store triggers the consumer towards choosing online grocery shopping, but without having any experiences yet. Increased distance from stores means that consumers are more likely to choose online food shopping.

The association of spatial accessibility assessment with the low tendency to buy food products online has been confirmed by (Chocarro *et al*., 2013; Clarke *et al*., 2015; Zhai *et al*., 2017; Zhen *et al*., 2018). Schmid & Axhausen (2019) also showed the relationship between travel time and the likelihood of making a purchase in-store and the time of order arrival with online shopping. These authors also take into consideration the simultaneous

influence of factors such as the risks of online shopping, which influenced the development of a subjective attitude of the consumer. Based on these findings, we propose the following hypothesis:

H3: The long distance of food stores from the place of residence positively affect the intention of consumers to buy food products online.

Trust

In the context of online shopping, trust is seen as a factor that directly influences and contributes to the formation of consumer attitudes, because the consumer is unable to protect himself from the power of the seller in the online space (Gefen, 2003). Online trust is "an attitude of confident expectation in an online risk situation that one's vulnerabilities will not be exploited." (Stewart, 1999). Trust in general but also trust in online transactions, implying the degree to which one can trust the promises made by others, encourages consumers to use the seller's value as a precursor to their future actions to create trust (Tang, 2021). Trust can be conceptualized as the degree to which one can trust and rely on promises made by others (De Fine Licht, & Brülde, 2021). In this way, it can be conceptualized as the attitude to which the extent to which the individual creates a favorable or unfavorable evaluation of the behavior of interest affects the propensity to buy online (Tang, 2021).

Early in literature it was underlined that the consumer creates trust in the form of feeling or expectation about the intention, integrity or competence of the trading partner (Moorman *et al*., 1992). It also reinforced by Li *et al*., (2021) who stated that the trust in actors of the food chain is influenced by the beliefs of consumers about the trustworthily of these actors.

D'Alessandro *et al*. (2012), interpreted trust as the buyer's confidence to buy online, buyers' expectations of the reliability and integrity of the seller's promises based on online sellers' guarantees. According to Karpik (2010) the problem that the consumer faces in relation to trust is not only against the seller but also the quality of the product offered. The risk of seller fraud worries buyers about the trustworthiness of online sellers. This is related to the fact that product information does not reflect its actual quality and the difficulty of finding a place to resolve disputes that arise during online purchases. Salespeople may provide false promotional information, or will not fulfill their customer service promises (McCorkle, 1990).

Kendall *et al*. (2019) and Psomiadis (2021) argue that consumers perceive food fraud as a risk to food safety. The risk of food safety and fraud depends in part on whether purchasing and quality control mechanisms are controlled by suppliers. Without touching the product, people hesitate to buy from

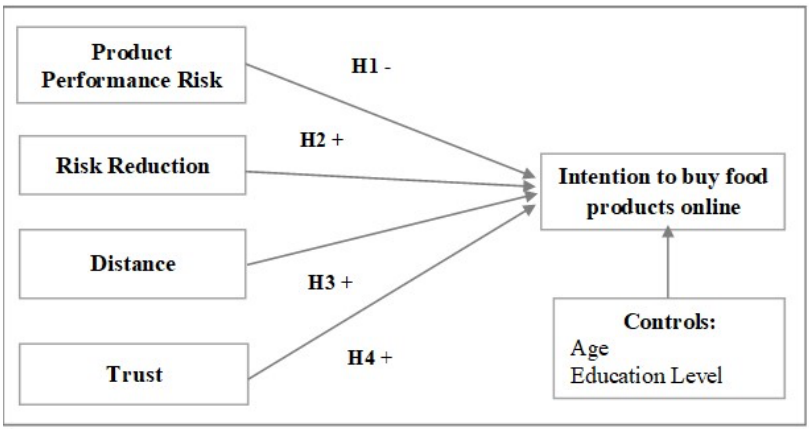
online stores (Daroch *et al*., 2020) which increases the role of trust in the relationship between the consumer and the sellers.

Grocery shoppers prefer to visit stores in person due to distrust in online channels (Gomes & Lopes, 2022). Lack of trust is also related to the fact that consumers are reluctant to provide their personal data, as they believe that online shopping is riskier than traditional shopping. Based on these findings, we propose the following hypothesis:

H4: Trust in the seller positively affect the intention of consumers to buy food products online.

The proposed conceptual framework with research hypotheses directions are presented in Figure 1. Also, in the model two control variables were introduced: age and education level.

Figure 1 - Conceptual framework of the study



2. Materials and methods

Data Collection and sample characteristics

Data was collected during 2023 in Tirana, the capital city of Albania, via a questionnaire with close-ended questions. Tirana was selected because it represents the region with the largest and most heterogeneous population in terms of age, education, lifestyle, and income (Luga *et al*., 2022).

The questionnaire was divided into four sections. The first section was designed to collect general information of consumers such as: socio-

demographic characteristics, use of the internet, time spent on the internet, social networks used, self-assessment of skills for using information technology etc. The second section of the questionnaire was designed to gather data regarding the purchasing pattern for food products, especially the place of purchase, the frequency and time spent to reach the store. The third part of the questionnaire was framed to gather information about consumers' online shopping experience. The questions focused on discovering the products purchased most often through online channels and the reason for not using online shopping for food products. The last section addressed the assessment of the factors that influence the intention of consumers to buy food products online, using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The reason why this type of question was used is related to the fact that they provide the highest certainty that the answers correctly reflect the opinion of the respondent (Burns & Bush, 2002; Wong, 1999; Zikmund, 2000). As for the scale used for these questions, there are no special rules, but various researchers emphasize that in order to get the respondents' opinion more accurately, the scale should be from five to seven (Aaker *et al*., 2000; Malhotra, 1999).

A total of 473 questionnaires were completed with the consumers which were randomly selected and interviewed. The face-to-face method was used for data collection. Of these, 250 questionnaires were filtered to those who had experience in online shopping, but not in online food shopping. In order to do this, the questionnaire began with a dichotomous variable, asking the respondent whether they had previously purchased products online. The questionnaire is then followed by another dichotomous variable asking respondents if they had previously made an online food purchase. From this group, only those who are not involved in the online food purchase were selected for the study. This distinction is made to avoid the bias of lack of experience with online shopping. Then, the collected data were processed through SPSS and AMOS software.

Table 1 shows a summary of the socio-demographic characteristics of the sample. The participants comprised of 69.9% females and 30.4% males with ages ranging from 18-65 years (average age 30.37 years). Food shopping has been considered in many studies as the domain of women, despite the agreement on the changes in the role of gender in family purchases (Mortimer, 2011). Regarding age, the 26-35 years' group had the largest number of respondents 36.8%, followed by the under 25 years old group with 25.6%. Overall, 76.4%, had undertaken undergraduate education.

Table 1 - Socio-demographic characteristics of the sample

Socio-Demographic Characteristics	Groups	Number of Participants	Number of Participants
Gender	Male	76	30.4%
	Female	174	69.6%
	Total	250	100.0%
Age (years)	< 25	64	25.6%
	26-35	92	36.8%
	36-45	47	18.8%
	46-55	30	12.0%
	> 55	17	6.8%
	Total	250	100.0%
Education Level	Primary education	9	3.6%
	Secondary education	50	20.0%
	University	95	38.0%
	Master Degree	96	38.4%
	Total	250	100.0%

Measurement development

Before testing the hypotheses, measurement reliability and validity were evaluated. Cronbach's α provided strong evidence of measurement reliability. According to Nunnally (1981) the minimum acceptable value for α is 0.70. The results of Exploratory Factor Analysis (EFA) (see Table A1 in the Appendix A) shows that each construct has Cronbach's α greater than the suggested threshold value of 0.70, giving evidence of constructs reliability. Also, it is shown that each of the factor loadings are grouped under one factor in values greater than 0.40 (Stevens, 2002) providing evidence of constructs convergent validity.

EFA generated 5 factors by using principal components analysis, accounting for 71.6% of the total variance. KMO test of sampling adequacy (.801) and Barlett's test of sphericity (χ^2 = 3735.977, df = 253, p = .000) confirm the appropriateness of the factor analysis (Field, 2009).

Following the results of EFA, Confirmatory Factor Analysis (CFA) was performed in AMOS. The result showed that the model has a good level of goodness of fit (Chi-square = 291.696; df = 211; p=.000; CMIN/DF = 1.382; CFI = 0.978, RMSEA = 0.039; TLI = 0.973).

Table 2 - Validity/Reliability and factor correlation matrix with square root of the AVE on the diagonal

	CR	AVE	MSV	MaxR(H)	Product performance risk	Intention to buy	Lack of Trust	Risk Reduction	Distance
Product performance risk	0.827	0.549	0.120	0.870	**0.741**				
Intention to buy	0.921	0.627	0.022	0.937	–0.112	**0.792**			
Lack of Trust	0.907	0.709	0.120	0.907	0.346	0.116	**0.842**		
Risk Reduction	0.857	0.610	0.022	0.906	0.032	0.148	0.032	**0.781**	
Distance	0.846	0.578	0.095	0.849	0.308	–0.021	0.139	0.056	**0.761**

Note: CR - Composite Reliability, AVE - Average Variance Extracted, MSV - Maximum Shared Variance, MaxR - Maximum Reliability.

Composite reliability (CR) was used to analyze the reliability. According to Bagozzi *et al*. (1991), the minimum CR value should be 0.6. Table 2, shows that reliability is achieved, given that each construct has CR greater than the suggested threshold value.

Convergent validity will be analyzed through Average Variance Extracted (AVE), as much more conservative measure of convergent validity than CR (Malhotra & Dash, 2011). Table 2 shows that each construct has an AVE greater than the suggested threshold value of 0.5 (Hair *et al*., 2010), therefore the constructs meet the condition of convergent validity.

Regarding discriminant validity, Hair *et al*. (2010), suggests that the three threshold values to prove discriminant validity are: a) AVE > MSV, b) AVE > ASV, c) square root of AVE greater than correlations inter-constructive. As it is showed in Table 2, the threshold values are reached, the constructs fulfill the condition of discriminant validity.

3. Results and discussion

Given the good fit of the structural model, (Chi-square = 335.761; df = 248; p = .000; CMIN/DF = 1.354; CFI = 0.976, RMSEA = 0.038; TLI = 0.971), the hypotheses were evaluated by analyzing the structural coefficients presented in Table 3.

Hypothesis one (H1) regarding Product Performance Risk is supported. The result shows that Product Performance Risk negatively affects the intention to buy food products online. This is consistent with the literature which suggests that Product Performance Risk drive consumers to not buy food products online. The perceived risk of online shopping is assessed as a loss and perceived subjectively by consumers (Zhang & Yu, 2020). Also Product Performance Risk is perceived differently by consumers who buy beyond physical stores (Ngyen *et al*., 2021). Most studies in the field of consumer behavior in terms of online shopping accept that the risk of product performance affects the consumer's intention to buy online. The customers believe that since they cannot have physical contact with the product they tend to perceive high level of risk. This is in the same line with Li *et al*., (2020) who states that products bought online do not guarantee the consumer their origins and this is also reinforced by negative experiences with perceived risk and food safety.

Hypotheses two (H2) on Risk Reduction has a significant positive effect on intention to buy online food products. Based on the analyses, the results indicate that the alternatives of risk reduction seem to positively affect the intention to buy online food products. A risk reduction is an instrument or action, initiated by the buyer or seller, to relieve risk perception which have

Table 3 - Structural model results

Hypothesis (H)		Estimate	Std-Estimate	S.E.	C.R.	P	Results
H1	Intention to buy ← Product Performance Risk	–.147	–.183	.061	–2.416	.016	√
H2	Intention to buy ← Risk Reduction	.127	.134	.063	2.018	.044	√
H3	Intention to buy ← Distance	.010	.008	.060	.164	.869	×
H4	Intention to buy ← Trust	.148	.177	.059	2.525	.012	√
Control	Intention to buy ← Age	.003	.096	.002	1.543	.123	×
Control	Intention to buy ← Education Level	.035	.123	.018	1.979	.048	√

been widely accepted by many authors as being endorsement, brand loyalty, major brand image, private testing, store image, free sample, money-back guarantee, government testing, shopping, expensive model, word of mouth (Roselius, 1971). The responders affirmed that these instruments encourage them to buy food products online. This is in line with several authors in literature. The use of brand trust as risk aversion is identified by Ha (2004); Matzler (2008); Konuk (2018). Good online experience, security, word-of-mouth, quality of information and privacy are identified as risk relievers (Ha, 2004). The application of the Online Sensory Marketing Index (OSMI) concept is used as an instrument that can improve the communication of the retailer to improve the communication with the online consumer regardless of the limitation of the application of this index in the case of the sale of food products (Hamacher, 2022).

Hypotheses three (H3) regarding Distance is not supported, this factors have an insignificant effect on intention to buy food products online. The result can be explained by the fact that consumers despite the distances, want to choose the product themselves. According to Monsuwé *et al.* (2004), in spite of the consumers' positive attitude toward shopping on the internet, the physical proximity of a traditional store that sells the same products available online, can lead consumers to shop in the brick and mortar.

The results of the study (Wieland, 2021) show that online shopping in food retailing slightly supports the distance effect compared to other products. This is supported by Marjanen (2001) who states that still in-store grocery shopping is preferable to online shopping because consumers increasingly associate shopping with their other activities, and this further reduces the explanatory power of distance *per se* in store choice patterns. This result can be explained as well as the daily lifestyle. Hansen (2005) showed that shoppers of grocery products in brick-and-mortar stores consider online grocery shopping to be less compatible with their daily lives. This is also reinforced by Dudziak *et al.* (2023), who underlines the fact that consumers shop at the nearest store when factors such as price and availability are kept unchanged. This model is seen as more convenient for consumers. Since food purchases are considered impulse purchases, interaction with environmental stimuli plays a major role in choice (Belk, 1975). Sounds, aromas, sight serve as stimulants that increase the desire to buy products (Kwan, 2016). The influence of lifestyle on consumer purchasing behavior has also been proven by Fatmawati (2020).

The result of the fourth hypothesis (H4) shows that Trust has a significant positive effect on intention to buy online food products. The respondents clearly state that they experience uncertainty as to whether the seller picks their products, whether he respects the rules of hygiene, or whether he is scrupulous with the weight of the products. Our results are in line with Xiao

et al. (2015), that state that a consumer's trust in vendor positively affects the consumer's intention to purchase online food. These results are reinforced by Daroch *et al.* (2020), that state that lack of trust leads some people to hesitation to use online shopping and they believe that online shopping is riskier than traditional shopping. An online retailer must pay attention to product quality, variety, design and brands they are offering to generate consumer trust. This is supported by Wu *et al.* (2021), who states that food system actors are responsible for building consumer trust.

Online retailers feel that there are still many challenges in the transition from a traditional store to an online one (Sarkovská & Chytková, 2019). Retailers' knowledge should help them to understand the differences between online and brick-and-mortar customer motivations to achieve their goal (Seidel, 2021).

Referring to Table 3, of the two control variables used in this model, only education level has a significant effect on intention to buy online food products, while age does not significantly affect intention to buy food products online.

4. Conclusion

Consumer behavior towards online purchases is undergoing rapid changes, also accelerated by the widespread use of technology and the internet. Buying food products online attracts discussions because buying through the internet is one of the most dynamically developing forms of trade (Ramus & Nielsen, 2005).

Food purchases include many types of products and consumers develop different behaviors and attitudes towards them (Hanus, 2016). The study of online shopping channels for food products is less studied than that for other products, such as clothing or electronic devices. Previous studies focusing on food products have taken into consideration the motivating factors that lead consumers to use online shopping channels. There are also some works focused on the limiting factors of online purchases, but there seems to be a gap in analyzing factors such as the perception of distance in the use of online channels for food products with some exceptions that focus on the purchase of shelf-life products.

This study revealed that product performance risk limits the consumer to engage in online shopping of food products. This result has a greater importance knowing that the consumer is concerned about quality and healthy food. In recent years, concerns for a quality and safe product has been an important driver for consumers (Imtiyaz *et al.*, 2021). Different researchers have proven that nutritional quality attributes positively influence

the purchase intention, consumption and consumer satisfaction. Product features and complexity seem to be negatively related to online shopping (Lu *et al.*, 2021). The need to experience contact with the product, especially with the food product that is categorized as an impulse purchase is driven by the interactivity with the market and the retailers. The choice of offline products over online ones is closely related to the lack of trust in the provision of fresh products and their quality. The experience of touching and solving food products, which is missing in online shopping, discourages consumers from using this form of channel. Also, the lack of variety in choices experienced by the consumer in online shopping drives them away from these forms of product insurance.

Whereas risk reduction results as an incentive factor for online shopping. This means that consumers look for reliable strategies to mitigate the risk to show a clear intention to buy online. Investment by retailers could help drive consumer awareness, propensity to consider online food shopping, and subsequent online purchase execution. The few experiences that are noticed in this market are related to consumers who buy a very limited number of food products online such as bottled water and with low frequency. These experiences can be used to start a communication to increase the online shopping food basket.

The results of the study show that the perception of the distance to the place of purchase of food products does not affect the intention to buy online. This will require further studies on the influence of lifestyle, the need for greater interaction of the buyer with the product and the seller, as well as in some cases the price differentiation between purchase channels.

The fourth factor studied, which was trust in retailers, has a positive effect on the intention to buy online. Consumers build a complementarity of trust in products and trust in sellers. The retailer's reputation and experience can be seen as predictors of future consumer behavior towards the online channel.

Online shopping in food retail is seen as a potential alternative for the future, but in developing countries it exists as a complementary alternative alongside physical stores.

This study provides several academic contributions. The first is the contribution to the literature on online consumer behavior for food products. This topic, from a consumer perspective, has been less explored in developing countries. The second contribution focuses on the factors that prevent consumers from shopping online for food products, offering faster interventions by retailers to increase consumer satisfaction. The third contribution is the result obtained from the combination of factors such as: product performance risk, which in the case of food products is the main driver of perception; risk reduction; distance and trust in the seller.

As managerial implications, the results can help strategic marketing managers focus on how they should analyze the consumer decision-making process in order to find and implement techniques that increase interactivity with the customer, building reverse channels in the case of an unsatisfied customer. To address the need for sensory appeal, retailers should enhance information by emphasizing natural appearance and product origin information for food products. Evidence from this paper related to consumer trust also shows the importance of improving online platforms in terms of ease of use and security of data. To build trust and reduce the perception of product risk, retailers should offer real images of the food products they sell.

Easy access to a large number of stores selling food products make the factor of distance unimportant to the consumer. However, more research is required to further understand consumer needs because the online food channels have been adopted less by consumers.

Regardless of the obtained results, a limitation of the study is the generalization of the research object to food products as a whole. Conducting the study of specific categories of food products can contribute to more accurate results.

Therefore, future research can investigate the online consumer behavior of different generations of consumers with different lifestyles, towards the tendency to adapt to technology and online shopping, as well as focusing on consumer segmentation for online food products.

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Appendix A

Table A1 - Exploratory Factor Analysis

Rotated Component Matrix	**Component**					
	α	**F1**	**F2**	**F3**	**F4**	**F5**
Intention to buy	**.927**					
I intend to buy food products online if the sales units are far from where I live		.787				
I intend to buy food products online if it would save me time		.811				
I intend to buy food products online if I could assess the freshness and the appearance of the products I want to buy		.859				
I intend to buy food products online if I had more confidence in the seller		.876				
I intend to buy food products online if the seller offers me more guarantees about product quality		.848				
I intend to buy food products online if I had more information about how the seller selects the products I have ordered		.889				
I intend to buy food products online if the seller does not charge for delivery		.740				
Trust	**.907**					
I trust the seller for product selection I ordered			.875			
I trust the seller that I will get the right weight and quality of the product I ordered			.845			
I trust the seller follows the hygienic conditions			.876			
I trust the service offered by the seller			.889			
Risk Reduction	**.863**					
I build trust through label information				.884		
I build trust by buying brands with a good image				.886		
I build trust through personal experience created				.882		
I build trust through the experience of others				.695		
Product Performance Risk	**.841**					
I may not get the right product quality					.816	
Size description may not be accurate					.755	
It is difficult for me to compare the quality of a similar product					.803	
I cannot try the product online					.838	
Distance	**.841**					
The shops where I buy food products are close and easily accessible						.830
The time I spend going to the shop is short						.783
There are different types of food shops near where I live						.809
There are a large number of food shops near where I live						.847

Note: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

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Guest Editorial
Revisiting the Slow Food Movement: Three Cases of Heritage, Innovation, and Sustainability in Alternative Food Networks

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Abstract

The special issue, 'Revisiting the Slow Food Movement: Three Cases of Heritage Innovation and Sustainability in Alternative Food Networks', explores the integration of Slow Food principles within Alternative Food Networks (AFNs) to enhance sustainability and cultural heritage preservation. By analysing case studies from Afghanistan, Ireland, and Switzerland, the editorial illustrates how AFNs can address food security, local communities' social adherence, economic viability, and environmental sustainability. The Afghan case emphasises collaborative agribusiness for resilience and market access, the Irish study focuses on sustainable lobster fishing practices, and the Swiss example highlights the revival of traditional red berry cultivation. Utilising the Triple Bottom Line framework, this editorial explores the multifaceted benefits of AFNs in fostering sustainable food systems that align with local cultural practices and innovative agricultural techniques. This special issue provides valuable insights for policymakers, practitioners, and scholars aiming to develop more resilient and equitable food systems globally.

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Introduction to the Special Issue

The special issue titled 'Revisiting the Slow Food Movement: Heritage, Innovation, and Sustainability in Alternative Food Networks' is rooted in the growing significance of sustainable food systems in addressing global food security challenges. The Slow Food Movement, which began in Italy in 1986 as a response to the globalisation of fast food, emphasises principles of good, clean, and fair food. These principles align closely with the goals of preserving biodiversity, promoting sustainable agriculture, and maintaining cultural heritage (Cacciolatti & Lee, 2022). This special issue thus explores how the Slow Food Movement's philosophy can be applied through Alternative Food Networks (AFNs) to foster sustainability and innovation in food systems worldwide (Cañada, & Vázquez, 2005).

There are current gaps in the literature concerning AFNs in diverse contexts (Michel-Villarreal *et al.*, 2019), especially in regions experiencing socioeconomic and political instability or that are affected by climate change (Moragues-Faus & Marsden, 2017). AFNs offer an innovative approach to food production and distribution that prioritises local, organic food systems and direct relationships between producers and consumers (Renting, Marsden, & Banks, 2003). These networks are vital in creating transparent and traceable food supply chains that can adapt to the unique challenges faced by different regions. By highlighting case studies from Afghanistan, Ireland, and Switzerland, this issue will provide insights into how AFNs can be leveraged to address food security, promote local food cultures and institutions (Pothukuchi & Kaufman, 1999), and integrate modern technologies and traditional practices for sustainable outcomes.

Furthermore, the intersection of cultural heritage and sustainability is a critical area of focus for this special issue. Food is a powerful expression of cultural identity and values, playing a significant role in social cohesion and community building (Brulotte & Di Giovine, 2016). The Slow Food Movement has been instrumental in preserving culinary traditions and promoting biodiversity by supporting small-scale producers and traditional food systems (Peano *et al.*, 2014). By revisiting the Slow Food Movement through the lens of heritage, innovation, and sustainability, this special issue seeks to shed light on the transformative potential of AFNs in creating resilient and equitable – and therefore more sustainable – food systems (Van Bommel & Spicer, 2011). This special issue contributes to the ongoing discourse on sustainable development and offers practical implications for policymakers, practitioners, and scholars dedicated to fostering sustainable food practices globally.

1. Slow Food, Alternative Food Networks, and the Innovation of Sustainable Food Systems

Innovation in sustainable food systems encompasses technological advancements such as precision agriculture, alternative proteins, and blockchain technology. These innovations reduce the environmental impact of food production, improve supply chain transparency, and increase access to nutritious foods (Trivelli *et al*., 2019). Social and organisational innovations also contribute to sustainable food systems by fostering collaboration among various actors and establishing new business models that support fair wages and working conditions for food workers. The Slow Food Movement and Terra Madre, as examples of AFNs, exemplify social innovation by creating platforms for small-scale farmers, food producers, and consumers to exchange knowledge and ideas on sustainable food practices (Canavari *et al*., 2016).

The Slow Food Movement's core philosophical principles include promoting good food (i.e., high quality and flavourful), clean (i.e., produced in an environmentally sustainable way), and fair (i.e., with accessible prices for consumers and fair conditions for producers) (Hsu, 2015). Terra Madre, a global network created by Slow Food in 2004, brings together small-scale farmers, fishers, food artisans, and activists from around the world to share knowledge and promote sustainable food production practices. This biennial event in Turin, Italy, serves as a platform for discussing and advancing the goals of the Slow Food Movement, reinforcing its commitment to biodiversity and cultural heritage (Hayes-Conroy & Martin, 2010; Rosa *et al*., 2022).

Alternative Food Networks (AFNs) share many similarities with the Slow Food Movement and Terra Madre, as they both prioritise local, sustainable food systems and emphasise the social and environmental dimensions of food production and consumption. Both frameworks aim to create transparent and equitable food supply chains that support local economies and preserve traditional food cultures (Renting *et al*., 2003; Cacciolatti & Lee, 2022).

AFNs have emerged as a significant force in the transformation of food systems towards greater sustainability and innovation. These networks encompass a range of initiatives that prioritise local, organic, and sustainable food production, distribution, and consumption. They include community-supported agriculture (CSA), farmers' markets, urban farming, and cooperative food enterprises (Medici *et al*., 2021) although the level of engagement depends also upon smallholder farmers' characteristics (Cacciolatti & Wan, 2012). Their contribution to the innovation and sustainability of food systems can be analysed through several key dimensions: environmental impact, economic viability, social equity, and technological advancement. We adopt the theoretical lens of the Triple

Bottom Line (TBL) to frame the papers presented in the special issue, and we approach their analysis through the cultural heritage, sustainability, and innovation dimensions.

2. Alternative Food Networks and the Slow Food Principles: the Cases of Ireland, Switzerland, and Afghanistan

The Slow Food Movement and its associated Terra Madre network emphasise principles of good, clean, and fair food. 'Good' refers to food that is nutritious and enjoyable, 'clean' commands production methods that are environmentally sustainable, and 'fair' pertains to accessible and equitable food systems for all. Terra Madre, by supporting small-scale farmers, fishers, and artisans in preserving traditional and sustainable practices, fosters direct connections between producers and consumers and promotes biodiversity. Thus, the Slow Food Movement aims to counteract the homogenising effects of industrial agriculture and by integrating these principles, practitioners can create food systems that respect cultural traditions, protect the environment, and ensure fair access to quality food.

By integrating the lessons from these three diverse case studies, practitioners can develop more holistic and context-sensitive approaches to building sustainable food systems globally and AFNs' similarities with the Slow Food Movement and Terra Madre are remarkable. We can observe, through various case studies around the world, that the collaborative agribusiness initiatives in Afghanistan demonstrate how AFNs can address food security challenges through increased agricultural productivity and resource enhancement (Amirzai & Chau, 2024). AFNs in Afghanistan integrate marginalised groups and foster collaboration among farmers, these initiatives improve access to markets and resources, ultimately enhancing food security in the region (see Study 3: Amirzaj & Chau, 2024). This aligns with the principle of good and fair food promoted within a Slow Food philosophy.

Likewise, in Ireland, the integration of the Slow Food Movement with the lobster industry highlights how AFNs can preserve local culinary heritage. The study shows how traditional practices maintain ecological and economic sustainability, demonstrating the intricate link between cultural heritage and sustainable practices, often fuelled by a combination of traditional practices and new technology and supported by the social ties within closely knit communities (see Study 2: Pauley, 2024).

Finally, in Switzerland, the case study of red berry cultivation in the Entremont region illustrates the significance of reviving traditional agricultural practices while enhancing local economies. In that case study

(see Study 1: Bertolino, 2024), practitioners learn the importance of re-evaluating neglected agricultural practices and recognising their cultural, social, and economic value. The following sections introduce more in detail the case studies.

2.1. *Cases Introduction*

2.1.1. Study 1: How Does Living Heritage Relate to Alpine Food?

This study focuses on the Entremont region in Switzerland, exploring the cultivation of red berries, which were once vital to the local economy. This study discusses the cultural, social, and economic importance of reviving this heritage after decades of neglect and examines the cultural, social, and economic significance of the cultivation of red berries, particularly strawberries and raspberries, in the Entremont region of Switzerland.

The study is set against the backdrop of the broader movement to recognise and safeguard intangible cultural heritage, particularly in the context of Alpine food heritage and discusses the historical importance of red berry cultivation from the 1930s to the 1990s and its decline due to various economic and social factors. The case also brings to the reader the contemporary efforts to revitalise this agricultural practice through community engagement and sustainable practices, drawing on criteria of sustainable development.

The historical and cultural significance of red berry cultivation is considerable, as these berries were not only a source of income but also a part of the local heritage, deeply embedded in the community's collective memory and practices, harnessing a sense of identity in the local community. The decline in cultivation over time took place because of factors such as international competition, changes in agricultural practices, and the socio-economic shift towards tourism and industrial employment. Nevertheless, an effort to engage the local community brought a revitalisation of traditional and more sustainable practices (Bertolino, 2024). The contemporary efforts to revive red berry cultivation involve community-based initiatives, participatory governance, and the integration of traditional knowledge with innovative agricultural techniques. Thus, the role of women as custodians of agricultural know-how is particularly strong, showing how intergenerational transmission of knowledge can support the sustainability of these practices.

Furthermore, we can see an alignment of the local sustainable and traditional practices of the Entremont region with the principles of Slow Food, as the local AFNs advocate for good, clean, and fair food systems. By focusing on the environmental, social, and economic dimensions of

sustainability, the revival of red berry cultivation is positioned as a model for sustainable development in mountain regions, contributing to the resilience of agricultural practices to adapt to contemporary challenges such as climate change and market competition (Ericksen, 2008).

2.1.2. Study 2: A Social Practice Perspective of Ireland's Lobster Cultural Food Heritage

Using Social Practice Theory, this study examines the integration of the Slow Food Movement with Ireland's lobster industry. The study emphasises the preservation of local culinary heritage and sustainable food systems, proposing a model that balances cultural integrity with sustainable practices through qualitative interviews and secondary data analysis. The research article titled 'A Social Practice Perspective of Ireland's Lobster Cultural Food Heritage' analyses the cultural and symbolic significance of lobster consumption in Ireland, the role of lobster in Irish culinary heritage and its potential for fostering sustainable seafood consumption.

The role of fishing communities in preserving local culture is paramount as they maintain cultural food heritage through traditional practices. These practices contribute to ecological and economic sustainability, emphasising the importance of community-based initiatives and the transmission of traditional knowledge across generations (Pauley, 2024). Yet, the maintenance of such a social tissue supporting sustainable lobster consumption comes with challenges and opportunities: despite the cultural significance of lobsters, their consumption in Ireland is low, mainly due to economic factors (the product is often highly priced and export is often a preferred destination), lack of culinary knowledge, and historical associations. The study stresses the importance of educational initiatives and community engagement to promote lobster as a sustainable food source, making it good and fair for the local community. This approach can enhance the appeal of lobster products and support the economic viability of coastal communities through sustainable practices.

2.1.3. Study 3: Alternative Food Networks in Afghanistan

This third study investigates collaborative agribusiness initiatives in Afghanistan, emphasising their role in addressing food security challenges. Through interviews with key stakeholders, the research identifies resilience, resource enhancement, and revelation (3Rs) as crucial components for improving access to markets and resources for smallholder farmers in remote

regions. This study, titled 'Alternative Food Networks in Afghanistan: The Role of Collaborative Agribusiness in Food Security' discusses the potential of collaborative agribusiness initiatives in addressing food security challenges in Afghanistan and emphasises community well-being, sustainability, and food justice. The article presents findings from interviews with key Afghan stakeholders, including farmers, agricultural entrepreneurs, and experts and identifies the critical role of collaborative agribusiness in enhancing agricultural productivity and food security. It also shows how AFNs integrate marginalised groups and improve access to markets and resources. Resource limitations are a main challenge to the resilience and sustainability of the Afghan food systems. Challenges such as water scarcity, lack of electricity, and insufficient infrastructure hinder agricultural productivity and the sustainability of the local economy. The absence of modern agricultural techniques and the reliance on traditional methods further exacerbate these issues. Addressing these resource limitations is crucial for the success of agribusinesses and overall food security in the region.

Thus, collaboration plays a crucial role in the enhancement of food productivity, and security. Collaborative agribusiness practices, deeply rooted in Afghanistan's religious and cultural traditions, play a vital role in supporting agricultural enterprises. Practices like Hashar, where farmers collaborate to harvest each other's crops, demonstrate the importance of community support and collective effort in overcoming resource constraints. These informal networks and practices help sustain agribusinesses despite the challenging environment, highlighting the resilience of Afghan farmers. Such principles as Hashar (as a form of agricultural gratuity) are well aligned with the Slow Food principles, where food is also more equitable, and fair.

Yet, from the organisational point of view, the absences of formal AFNs leave way for more informal networks: formally coordinated community-supported agriculture or fair-trade initiatives are rare in Afghanistan. Instead, informal networks and local cultural practices fill this gap, providing a unique form of alternative economic frame. These informal networks, characterised by strong community bonds and mutual support, enable farmers to navigate the complexities of the agricultural market and enhance food security.

2.2. *The Triple Bottom Line as a Theoretical Lens for the Analysis of the Alternative Food Networks Phenomenon*

For this editorial, we chose the Triple Bottom Line (TBL) as a sustainability theory for the case analysis. The TBL framework (Elkington, 1994) evaluates sustainability based on three interconnected dimensions:

environmental, economic, and social sustainability. This comprehensive approach aligns well with the themes explored in the editorial: cultural heritage, innovation, and sustainability in AFNs. The TBL framework extends the traditional financial accounting framework, which focuses on profitability, to include social and environmental dimensions, thus assessing an organisation's impact on 'people, planet, and profit'. This holistic approach encourages businesses to consider their long-term sustainability and societal contributions alongside economic performance. Recent studies highlighted the importance of the TBL in driving corporate social responsibility and sustainability practices. For instance, integrating TBL principles can enhance organisational reputation, stakeholder engagement, and long-term financial success (Murray *et al.*, 2017), and can foster innovation and resilience in supply chains, promoting sustainable business practices across various industries (Rashidi *et al.*, 2020). The following presents the three dimensions of the TBL theoretical framework.

Environment. The environmental dimension of the TBL focuses on the impact of activities on the natural environment. In the context of AFNs, environmental sustainability comprises practices that reduce carbon footprints, promote biodiversity, and minimise the use of harmful chemicals in agriculture. The case study from Afghanistan illustrates how collaborative agribusiness initiatives enhance agricultural productivity while promoting sustainable resource use. The case study from Switzerland shows that the revitalisation of traditional red berry cultivation practices supports the preservation of biodiversity and agroecological practices. Likewise, the case from Ireland demonstrates how local communities can rediscover the local culinary tradition, preserving local fish stock varieties. These examples demonstrate how AFNs contribute to environmental sustainability by prioritising local and organic food systems and reducing the environmental impact associated with conventional agricultural practices (Renting, Marsden, & Banks, 2003; Kremen, Iles, & Bacon, 2012).

Economy. Economic sustainability within the TBL framework emphasises the viability and profitability of activities over the long term. The AFN initiatives described in the editorial showcase how economic sustainability can be achieved through direct relationships between producers and consumers, fair pricing, and local economic stimulation. The case study from Ireland highlights the economic benefits of integrating traditional lobster fishing practices with modern sustainability initiatives, ensuring fair wages and stable incomes for local fishing communities. Similarly, the Afghan collaborative agribusiness initiatives show how enhancing agricultural productivity and market access can improve food security and economic stability for smallholder farmers. On the other hand, in Switzerland, the economic impact of the revival of traditional berry cultivation practices can

create employment in an industry that ceased to thrive due to the loss of local know-how. These examples highlight the potential of AFNs to create economically viable food systems that support local economies and provide sustainable livelihoods (Jarosz, 2008; Mount, 2012).

Society. Social sustainability in the TBL framework addresses the well-being of individuals and communities, ensuring social equity and justice. This editorial emphasises the importance of preserving cultural heritage, which is integral to social sustainability. The Irish case study demonstrates how traditional culinary practices can foster community cohesion and cultural preservation while promoting sustainable food consumption. In Switzerland, the renewal of red berry cultivation highlights the cultural and social significance of reviving traditional agricultural practices. Finally, the Afghan case study highlights the role of inclusive and participatory approaches in enhancing food security and community resilience. These examples illustrate how AFNs contribute to social sustainability by promoting food justice, preserving cultural heritage, and fostering inclusive and equitable food systems (Guthman, 2008; Alkon & Agyeman, 2011).

The TBL provides a robust framework for analysing the sustainability contributions of AFNs. By evaluating AFNs through the lenses of environmental, economic, and social sustainability, this theoretical frame offers a comprehensive understanding of how these networks can address contemporary food system challenges. The integration of case studies from Afghanistan, Ireland, and Switzerland within this framework highlights the variety of benefits of AFNs and their potential to create more sustainable, equitable, and resilient food systems globally (Elkington, 1994).

2.3. *Alternative Food Networks' Impact on the Sustainability of Food Systems*

AFNs significantly reduce the environmental footprint of food systems. By focusing on local production and consumption, these networks minimise the carbon emissions associated with long-distance transportation and the use of chemical inputs in conventional agriculture (Renting, Marsden, & Banks, 2003). Studies have shown that local food systems tend to use fewer synthetic fertilisers and pesticides, promoting agroecological practices that enhance soil health and biodiversity (Kremen, Iles, & Bacon, 2012). Urban farming and vertical farming, key components of AFNs, further contribute to sustainability by optimising land use and reducing the need for land conversion, which is often associated with deforestation and habitat loss (Despommier, 2010).

From an economic sustainability point of view, AFNs often operate on models that support fair prices for producers and affordable prices for consumers, creating a more balanced economic system. By fostering direct relationships between producers and consumers, AFNs eliminate intermediaries, ensuring that a larger share of the profit goes to the farmers or other local stakeholders. This model has been particularly beneficial for small-scale and marginalised farmers who struggle to compete in conventional markets (Michel-Villarreal *et al.*, 2020) dominated by large agribusinesses (Jarosz, 2008). Furthermore, AFNs stimulate local economies by keeping financial resources within the community, which can lead to the creation of jobs (Cacciolatti & Mar Molinero, 2013) and support for local businesses (Mount, 2012).

Finally, social equity is a cornerstone of AFNs, which aims to create an inclusive and participatory food system. AFNs often prioritise the needs of vulnerable and marginalised communities, providing them with access to healthy and nutritious food (De Schutter *et al.*, 2020). Initiatives such as food cooperatives and CSAs engage community members in the decision-making process, fostering a sense of ownership and empowerment (Guthman, 2008). AFNs also promote food justice by addressing issues such as food deserts and nutritional disparities in urban and rural areas (Alkon & Agyeman, 2011). By supporting fair labour practices and equitable distribution of resources, AFNs contribute to the creation of more just and resilient food systems (Knickel *et al.*, 2018), thus contributing to the local and national economy, health and wealth.

2.4. *Alternative Food Networks and Technological Advancement*

Sustainable food systems are defined by their ability to provide healthy, nutritious, and affordable food while preserving the environment and supporting local communities (Revoredo-Giha *et al.*, 2011). Innovation in AFNs is not limited to social and economic practices but extends to technological advancements as well. Technological advancement is at the core of sustainable food systems, where traditional and contemporary scientific and engineering knowledge are combined in solutions to support food production, processing, and distribution.

For instance, precision agriculture, blockchain technology, and alternative protein sources are some of the technological innovations that AFNs have embraced to enhance sustainability. Precision agriculture uses sensors, data analytics, and automation to optimise resource use, reduce waste, and improve crop yields (Pierpaoli *et al.*, 2013). Blockchain technology, on the other hand, increases transparency and traceability in food supply

chains, allowing consumers to make more informed decisions about the sustainability and ethicality of their food choices (Kamilaris *et al.*, 2019). Also, the development of alternative protein sources such as plant-based meats and cellular agriculture offers sustainable alternatives to traditional animal farming, reducing the environmental impact associated with livestock production (Parodi *et al.*, 2018).

Innovation thus plays a crucial role in fostering sustainable food systems by introducing new technologies, processes, and practices that enhance efficiency, productivity, and resilience. For instance, the study 'A Social Practice Perspective of Ireland's Lobster Cultural Food Heritage' examines how integrating the Slow Food Movement with Ireland's lobster industry can preserve local culinary heritage and promote sustainable food systems. By adopting a Social Practice Theory perspective, the research highlights the symbolic importance of lobster in Irish culture and its role in ecological and economic sustainability. Yet, it highlights the importance of navigation tools and lobster cage design, which are informed by the local knowledge embedded in the local fishing communities. The study proposes a model that balances cultural integrity with sustainable practices, demonstrating the intricate link between tradition, technology, and sustainability.

3. Alternative Food Networks and Collaborative Agribusiness

Another important aspect contributing to the sustainability of resilient and small-scale food systems, other than the focus on the TBL and its acceptance of technological development, is the strong collaborative element that permeates AFNs. AFNs redefine food production, distribution, and consumption by prioritising local and organic food systems, reducing the carbon footprint associated with long-distance transportation, and fostering direct relationships between producers and consumers.

These networks do embrace innovative approaches such as urban farming, community-supported agriculture, and vertical farming, but none of this would be possible without the ability to coordinate and collaborate for the mutual benefit of the AFNs' members and extended stakeholders. For instance, the study 'Alternative Food Networks in Afghanistan: The Role of Collaborative Agribusiness in Food Security' explores how collaborative agribusiness initiatives can address food security challenges in Afghanistan. By integrating marginalised groups and improving agricultural productivity through collaboration, these initiatives enhance resilience, resource utilisation, and revelation (i.e., 3Rs), ultimately improving access to markets and resources for smallholder farmers in remote regions.

3.1. *Local Heritage and Cultural Preservation in Sustainable Food Systems: Education and Advocacy*

Promoting traditional, local, and sustainable food systems as alternatives to the globalised fast-food industry is essential for preserving cultural heritage and biodiversity. Food marketing plays a significant role in promoting local culinary culture and safeguarding culinary traditions that might otherwise disappear. By expressing cultural identities and values through food, communities can maintain their heritage and pass it on to future generations (Cacciolatti *et al.*, 2015). The Slow Food Movement and Terra Madre provide platforms for small-scale farmers, food producers, and consumers to exchange knowledge and ideas, emphasizing the importance of cultural heritage in sustainable food systems.

Cultural heritage plays a vital role in shaping food systems worldwide, as food often embodies the identities, values, and traditions of communities. The preservation of culinary traditions and biodiversity is essential for maintaining cultural heritage too (Polito *et al.*, 2020). For instance, in the context of the Swiss Alps, the study 'How Living Heritage Relates to Alpine Food?' highlights the case of red berry cultivation in the Entremont region of Switzerland. This cultivation, once a significant part of the local economy, had been neglected for decades. However, recent action research at the Centre Régional d'Etudes des Populations Alpines (CREPA) and the Interreg project's efforts have brought a renewed focus on the cultural, social, and economic values of these berries. This reconsideration stresses the importance of local food heritage and its potential revitalisation.

Education and advocacy are thus an important element of the rediscovery and preservation of the cultural heritage of a community (Made Prastyadewi *et al.*, 2020), and this is particularly true when promoting sustainable food systems and reducing food waste. Through awareness campaigns and educational programmes, consumers can learn about sustainable food consumption practices and the impact of their choices on the environment and society. Food co-creation and innovative business models can drive sustainability by involving consumers in the production process and fostering a sense of ownership and responsibility. Advocacy efforts can influence policy changes (Maye & Duncan, 2017) and support the development of more sustainable food systems. By educating the public and advocating for sustainable practices, more informed and responsible food cultures can be fostered.

3.2. *Case Analysis*

The three papers under consideration each explore different aspects of the Slow Food Movement and AFNs in distinct contexts: Afghanistan, Ireland, and Switzerland. The TBL framework, which encompasses social, economic, and environmental dimensions, provides a comprehensive lens to compare the main issues discussed in these papers.

Social Dimension. In Afghanistan, the social dimension is heavily influenced by collaborative agribusiness practices, which are deeply rooted in cultural and religious traditions such as Hashar, where farmers help each other during harvest times. This fosters strong community ties and mutual support, which are crucial in a conflict-affected region with limited formal structures. On the other hand, in Ireland, the focus is on the cultural significance of lobster fishing communities, emphasising the preservation of traditional practices and community engagement to promote sustainable seafood consumption. Last, the Swiss study highlights the role of community-based initiatives to revive red berry cultivation through an active engagement of the local population and programmes to recover local traditions and the sustainable agricultural practices associated with their cultural heritage.

Economic Dimension. Economically, Afghanistan faces significant resource limitations, including water scarcity and inadequate infrastructure, which hinder the development of agribusinesses. Despite these challenges, collaborative efforts among farmers have led to increased agricultural productivity and better food security. In Ireland, the lobster industry struggles with low domestic consumption, but initiatives to educate and engage the public hold promise for economic recovery in that declining industry. In Switzerland, red berry cultivation is seen to boost local economies by promoting agrotourism and supporting small-scale farmers in generating more income locally, while preserving local jobs and contributing to a resilient ecosystem (Rosli & Cacciolatti, 2022).

Environmental Dimension. Environmentally, the Afghan paper highlights the need for sustainable agricultural practices to conserve limited resources and reduce environmental degradation. Collaborative agribusiness initiatives promote resilience and resource enhancement, crucial for long-term sustainability. Likewise, the Irish study highlights the importance of sustainable fishing practices and the role of the Slow Food Movement in advocating for environmentally friendly seafood consumption, as traditional practices are inherently respectful of fish stock preservation. The Swiss paper promotes environmentally sustainable agricultural practices that preserve biodiversity and reduce the environmental impact of farming. The Table 1 juxtaposes the three cases.

Table 1 - Comparison of the case studies in the special issue

Dimension	Afghanistan (Amiraj & Chau, 2024)	Ireland (Pauley, 2024)	Switzerland (Bertolino, 2024)
Cultural Heritage, Innovation, and Sustainability			
Heritage	Preservation of traditional farming methods and cultural practices such as Hashar	Preservation of traditional lobster fishing practices and cultural heritage	Revitalisation of traditional red berry cultivation methods, promotion of local food heritage
Innovation	Introduction of collaborative agribusiness initiatives to enhance productivity and sustainability	Innovative public engagement strategies to boost domestic lobster consumption	Innovative agricultural techniques and community engagement to restart red berry cultivation
Sustainability	Focus on building long-term resilience for harsh climate conditions through sustainable agricultural practices	Promotion of sustainable fishing practices to ensure the long-term viability of lobster populations	Sustainable agricultural practices to preserve berries biodiversity and support local economies
TBL layer			
Social (*fair*)	Strong community ties through collaborative practices rooted in cultural and religious traditions	Cultural significance of lobster fishing, community engagement in sustainable practices	Community-based initiatives in red berry cultivation, reconnecting locals with cultural heritage
Economic (*good*)	Resource limitations, but increased productivity through collaborative efforts and gratuity system	Low domestic consumption of lobster, economic potential through public engagement and education	Economic boost through agro-tourism, support for small-scale farmers and local traditional practices advocacy
Environmental (*clean*)	Emphasis on sustainable practices to conserve resources and reduce soil and natural resources degradation	Sustainable fishing practices, advocacy for environmentally friendly seafood consumption	Promotion of sustainable agriculture, preservation of biodiversity

4. Considerations for Policymakers and Practitioners

Practitioners in the field of sustainable food systems can derive valuable insights from the case studies of AFNs in Afghanistan, Ireland, and Switzerland. First, the Afghan case study demonstrates the importance of collaborative agribusiness initiatives in addressing food security challenges. Practitioners learn that by fostering cooperation among farmers and integrating marginalised groups, agricultural productivity can be significantly enhanced. This collaborative approach not only improves access to markets and resources but also builds resilience within the farming community, through economic interventions of gratuity, i.e. Hashar. Such strategies can be adapted by policymakers and practitioners in other regions to support smallholder farmers, tailoring collaborative models to local contexts to achieve similar outcomes in improving food security and community well-being.

Second, the Irish lobster industry case study provides a compelling example of how integrating traditional practices with modern sustainability initiatives can preserve cultural heritage while promoting ecological and economic sustainability within local communities. Practitioners learn the value of leveraging local cultural assets and traditional knowledge to support sustainable food systems. By using Social Practice Theory, the study illustrated the role of cultural practices in maintaining sustainable consumption patterns. This shows practitioners the importance of understanding and incorporating local traditions and values in the design of sustainability programmes geared towards market stimulation within a local region. It suggests that successful sustainable food systems can be built not only on technological and economic innovations, which are nevertheless important but also on the cultural practices that resonate with local communities.

Last, in Switzerland, the case study of red berry cultivation in the Entremont region reminds us of the significance of traditional agricultural practices to enhance local economies and cultural heritage. From this study, policymakers and practitioners learn the importance of re-evaluating neglected agricultural practices and recognising their cultural, social, and economic value. The case study offers a model for practitioners to follow in other regions where traditional practices have been abandoned. This study demonstrates that reviving and supporting local food heritage can contribute to economic development, cultural preservation, and sustainability, corroborating the idea that resilient AFNs also focus on food that is good, fair, and clean. Practitioners and policymakers can integrate the lessons from these three diverse case studies and develop more holistic and context-sensitive approaches to building sustainable food systems globally.

Conclusions

The interconnected themes of heritage, innovation, and sustainability are central to creating resilient and equitable food systems (Garrido-Pérez & Sidali, 2014). The Slow Food Movement's principles continue to be relevant in addressing contemporary challenges in the food system. By integrating these principles with innovative practices and AFNs, we can promote sustainable agriculture, preserve cultural heritage, and support local communities. Further research and collaboration in this field are essential for developing more sustainable food systems that meet the needs of present and future generations.

AFNs play a crucial role in the innovation and sustainability of food systems by reducing environmental impact, enhancing economic viability, promoting social equity, and embracing technological advancements. These networks offer a viable alternative to conventional food systems, addressing some of the most pressing challenges of our time. As AFNs continue to evolve and expand, they hold the potential to transform global food systems into more sustainable, equitable, and resilient structures. Future research and policy support are essential to maximise the benefits of AFNs and ensure their integration into broader food system frameworks. Future studies could dissect the constructs adopted in the studies of this special issue and build models that could help with the generalisation of the findings to larger and more diverse samples.

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How Living Heritage relates to Alpine Food? Evidence from the Entremont Region (Switzerland)

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Abstract

Recently, the Alps have been experiencing new social phenomena, as a return to agriculture. In this context, the alpine food heritage has been reconsidered after a period of neglection, and is now under application to UNESCO Register of good safeguarding practices in the frame of the Convention for the Safeguarding of the Intangible Cultural Heritage. This paper reflects on a specific case study, the cultivation of red berries in the Entremont region (Switzerland), in the light of an action-research at the Centre régional d'études des populations alpines (CREPA) in Sembrancher (Switzerland), also financed by the *Interreg project Living ICH - Cross-border governance instruments for the safeguarding and valorization of the Living Intangible Heritage*. The extent of the red berries from the 1930s to the 1990s shows the importance of this cultivation for the local economy in the last century. Nowadays, there are few evidences of the red berries, due to the preponderance of the meadows used for mowing but, after several decades of abandonment, a reconsideration of the cultural, social and economic values of these berries seems to be in order.

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Introduction

Alpine food heritage, slow food principles and the goal of sustainability

In the recent Statement of the Alpine Food Heritage Charter, this latter is defined as «the set of sustainable production and consumption practices, knowledge and skills, productive landscapes, and traditional food produced in Alpine regions through relying on the commons, shared goods and services as well as on mutual assistance»[1] (Alpfoodway, 2019). This definition derives from an extension of what cultural heritage means nowadays: no longer relegated solely to the authorial and material forms of art (Poulot, 2006), the definition of cultural heritage is extended to the tangible and intangible cultural productions of the working classes and non-European populations. That is to say, the variety of products related to daily, professional, domestic and festive life transmitted from a body of knowledge, beliefs and techniques, as the Convention for the safeguarding on the Intangible Cultural Heritage stated twenty years ago (UNESCO, 2003). In the age of globalisation, it was feared that these processes would consign traces of the past to oblivion, especially in rural areas with high levels of emigration, such as parts of the Alps. At the end of the last century, this sense of urgency led to talk about patrimonialisation also in relation to intangible assets, a term that designates the socio-cultural/political/legal processes of the heritage-making (Hertz *et al*., 2018). In the last twenty years, heritage has become a paradigm for the interpretation of the modern challenges in the global word (Bortolotto, 2010). In this context, and over the last two decades, a growing attention has been paid to the recognition of food as heritage (Romagnoli, 2019; Fontefrancesco *et al*., 2022). Food and foodways are, nowadays, objects transformed into heritage which, on the local and global scale, «it is used to indicate, explicate and replicate important ideological claims on identity, ownership, sovereignty, and value» (Di Giovine & Brulotte, 2016: 4). To refer to the official attribution of the status of heritage, terms as food patrimonialisation or food heritagisation are used. This latter can be conceived as the «socio-cultural process through which different agents identify food and gastronomic resources embedded in a given place» (Zocchi *et al*., 2021). These resources are recognized by «a dynamic of enhancement […] consisting of updating, adapting and reinterpreting features drawn from the history of a group, […] and thus producing new social meaning by drawing on the past» (Bessière, 2012). The results of the food heritagisation are elements defined as: food

1. With this charter, different associations and institutional bodies from different Alpine regions are now endorsing the inscription of the Alpine Food Heritage on the UNESCO's Representative Register of Good Safeguarding Practices (UNESCO, 2003).

heritage, agri-food heritage, gastronomic heritage, and culinary heritage. Even if some related characteristics are specific of every definition (Zocchi *et al*., 2021), these terms give the idea of the complex nature of food which embraces nature, culture and *techne* (Heller, 2007 in Fontefrancesco *et al*., 2022), as the same for the intangible cultural heritage.

Moreover, in the same years of the emergence of the importance of the intangible cultural heritage, different movements reclaiming for "good, clean and fair" food in the era of the globalization and standardization of taste and food take an international outreach. It is the case of Slow Food movement. Born as an association in defense of the quality food consumption (Grimaldi *et al*., 2019), its attention paid to gastronomy has become more complex, as Siniscalchi notes (2013). Its focus has been extended to the three pillars of sustainability (economic, social and environmental) and its intervention covers nowadays the entire food chain, from soil to table (Kinley, 2012). Fighting against the intensive agro-industrial production and the deterritorializazion of products and production, Slow Food advocates for the maintain and restoration of the biocultural diversity and for the protection of the foodscapes, threatened with extinction caused by industrialisation and commodification of food (Fontefranscesco *et al*., 2022: 528). It acts for the rediscovering of the value of species, varieties, and practices that have been marginalized due to the cultural dominance of agricultural model focuses on maximizing and standardizing yields and production through the introduction of new species and varieties, the intensification of mechanization and the use of fertilizers and pesticides (Zocchi *et al*., 2021). Concrete actions are taken by the Slow Food Foundation for Biodiversity, founded in 2003 in Italy[2], thanks to some projects such as the Ark of Taste, the Presidia, the Earth Markets, the Convivia (Ruffa & Monchiero, 2002), the Slow Food Travel Agency (Askin Uzel, 2021) and by some big events, such as Salone del Gusto and Terra Madre.

The Alps – in which more than 30% of the total surface is still use for agricultural purposes (Flury, Huber, Tasser, 2013) – seems to be a privileged point of view in order to analyse the contemporary process linked to the creation of alternative food networks and territorial innovation in the Alps (Zanon, 2018) as a response to the conventional agriculture. Firstly, because in the Alps the mechanization is quite impossible, and some processes are still manual. Secondly, because the Alps are experiencing the arrival of new dwellers which are committed to work on traditional production techniques and bring some innovative ideas about new productional chains. Thirdly, because in the Alps it is still possible to find a large biodiversity in

2. www.fondazioneslowfood.com/en/what-is-the-foundation.

fruits, vegetables, cereals, and native livestock breeds. And finally, because mountain agriculture all over the world has shaped highland landscapes, included the Alps: «mountain communities have developed valuable traditional knowledge and practices in crop cultivation, livestock production, water harvesting, forestry and agroforestry, which are well adapted to natural ecosystem biochemical cycles» (Romeo *et al*., 2021: 2) and now can contribute to a sustainable transition.

Table 1 - Numbers of agricultural products safeguarding by the Ark of taste project and valorising by Presidia project, and of Slow travel destination for the Alpine regions (based on the Alpine Convention perimeter)

Alpine regions of	Ark of taste	Presidia	Slow food travel destinations
Italy	195	56	3
Switzerland	53	19	1
France	28	4	–
Austria	25	7	2
Germany	2	0	–
Slovenia	7	–	–

In June 2023, while the European Commission was working on the publication of the proposed Sustainable Food Systems Law (Sfs), due by the end of 2023, Slow Food published a position paper on the urgent necessity to build resilient food systems that guarantee healthy and sustainable food (Coste & Wolff, 2023). In this position paper, authors interconnect the three basic criteria of sustainability (economic, social and environmental) with the three fundamental values of the Slow Food philosophy (good, clean and fair) in an era of transitions and rapid cultural, economic and environmental changes. Six dimensions of this interconnexion are underlined, as the Table 2 shows.

Cultural heritage can as well play an important role in the sustainable development processes. For the first time, the role of culture has been recognized in the United Nation's Agenda 2030[3], and the valorization of

3. The 2030 Agenda for Sustainable Development constitutes a plan of action addressing the three dimensions – economic, social and environmental – of sustainable development through 17 Sustainable Development Goals as highly interdependent spheres of action: https://whc.unesco.org/en/sustainabledevelopment.

Table 2 - Interconnection between the Slow Food principles and the sustainability criteria based on the 2023 Slow Food position paper (Coste & Wolff, 2023, pp. 6-9).

Sustainability criteria	**Slow food principles**		
SOCIAL	GOOD	Healthy food systems	Slow Food defines healthy diets as those that promote human health and at the same time respect the health of the planet, favouring plant-based, whole-grain and less processed foods, produced locally using sustainable methods
		Socially and culturally adequate	Food system is sustainable if it prevents and counteracts the occurrence of inequalities within it such as those on gender, race or social class
ENVIRONMENTAL	CLEAN	Environmentally friendly	The key to a sustainable food system is the transition from industrial to agro-ecological agriculture
		Resilient	Sustainable food systems are resilient in the sense that they are able to adapt to change, recover quickly from any problems and redirect themselves towards more sustainable outcomes
ECONOMIC	FAIR	Ethically sound	Sustainable food systems should reflect the values of their societies such as democracy, transparency, solidarity, equality, human rights, inclusion, justice between generations and animal welfare
		Economically viable	Sustainable food systems are based on a level playing field for all and a legal and financial framework that incentivises the production of healthy and sustainable food

the intangible cultural heritage is seen as a way to reach sustainability (UNESCO, 2017). The link between living heritage and sustainability, already stated in the 2003 Convention, is received more and more visibility, as the recent chair in Intangible Cultural Heritage and Sustainable Development at CY Cergy Paris University shows. Sustainable development has entered in what Bortolotto (2013) describes as a "translation arena". That's to say, in the discourses of the international organisations as UNESCO or in the national networks (Severo, 2012), where the need to homogenise a globally valid category inevitably clashes with the cultural diversity inherent in its manufacture and its cultural declinations.

It seems that at the global level the concept of sustainable development has shifted. As Bushell (2015) states: «The fulcrum is arguably now social rather than ecological or cultural, though all remain firmly subordinate to economic policy. And, while heritage is not explicitly mentioned, it is repeatedly invoked in most of these declarations of our humanity. It is notable that the linkages – theoretical and pragmatic – between natural and cultural remain relatively isolated despite the connection between natural environment and society, and in particular the economy» (p. 502). Lately, in the anthropological studies, the ontological turn and the more-than-human perspective (Heywood, 2017) raises questions about the capacity of the intangible cultural heritage to offer an opportunity to renew discourse and action towards and with the environment in the face of contemporary challenges. The entanglement with the environment is part of this new heritage category: the diversity of practices and expressions can be seen as so many responses of individuals and groups to their environment and in constant adaptation to changes in the latter, testifying to the creativity of communities (Tornatore, 2019a; 2019b).

In this scenario, «the elevation of food to the status of heritage can enhance the sustainability of the food system while safeguarding traditional food resources through the active participation of local communities» (Zocchi *et al*., 2021: 1-2). But researchers do not stop to underline the importance of considering some "unintended aspects" of food patrimonialisation and heritagisation. In a literature review based on sociological, anthropological and geographical sources, Zocchi et al. (2021) argue the possible side effects and criticalities of food heritagisation. Authors highline 7 unintended aspects (or risks) linked to the 3 phases of the heritagisation process – the heritage recognition, legitimization and valorisation – and their main causes. Between them, some risks are linked to frictions and conflicts which could emerge in the process of recognition, as well as a marginalization of some local actors. Other risks are linked with the process of legitimisation which could applied some exogenous models. The result could be a standardization and

homogenization of food and gastronomy. In the final phase, the valorization, market could enhance some processes of loss of traditional values, an increase competition or a loss of control over the access of the local resources. For this reason, Grasseni (2013) has already highlighted the "food commodification" as a critical issue.

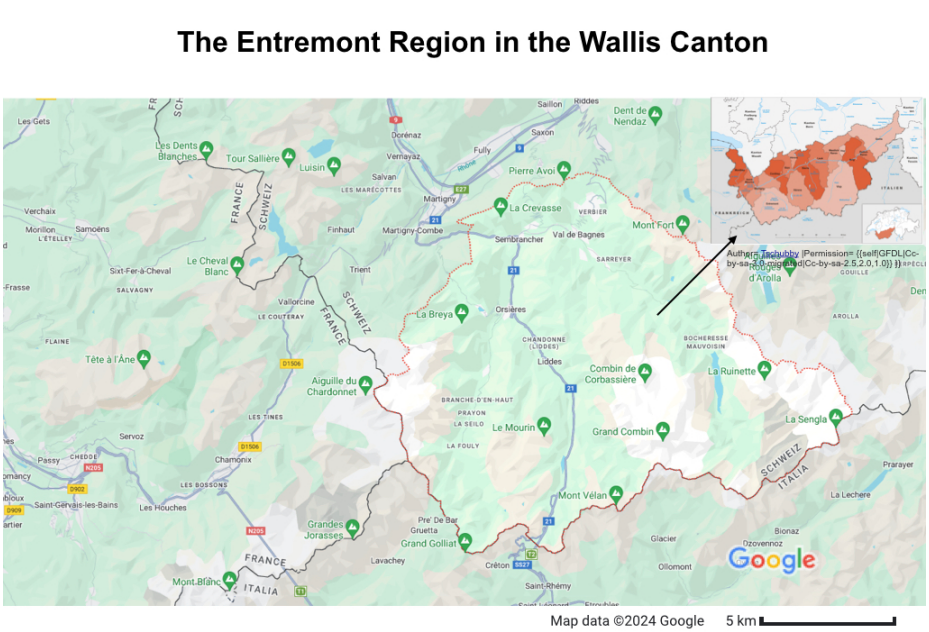
Aims of the study

The Alps have always been a fertile ground for the anthropological studies on the cultural heritage since the dawn of the discipline, raising new questions and research methodologies in recent years (Bonato & Viazzo, 2016; Calzana *et al*., 2023). Studies have focused on the construction of a specific Alpine cuisine (Grasseni, 2007; 2017), on the revalorisation and patrimonialisation of local agri-food chains and products and, recently, on the interaction between the agri-food systems and the territorial systems in transition (Delfosse, 2022; Brand & Pettenati, 2022). As a complex ecosystem with a high level of naturality but at the same time with a high density of population and infrastructures, Alps could be a very laboratory for experimenting sustainable process, as the international Alpine Convention suggests for the politics and policies (Permanent Secretariat of the Alpine Convention, 2011; 2013; 2017). Agriculture and food systems are economic keys and drivers for development. Alpine food heritage, by its side, could be a lever for the revitalization of the territorial system. As Delfosse (2019) states for the French Alps, the transition toward a more sustainable territorial foodway system has given some unexpected results such as the relaunch of the gardening, and with it of the local know-hows and practices linked to the cultivation of vegetables, berries, and fruit trees. Collective gardens are an example of the need for sharing knowledges, techniques, and practices (p. 44), while participative grocery shops projects are helping new ways to distribute food products in rural areas. These projects, in which intangible cultural heritage often plays a crucial role, emerge from local actors (Loudiyi & Houdart, 2019), showing a high level of social innovation (Landel & Koop, 2018) intended as "the reconfiguration of social practices traditionally embedded in mountain territories, including habits and customs, networks of cooperation and decision-making processes (Howaldt *et al*., 2015 in Gretter *et al*., 2019). All of these elements take part of the new dynamism of rural and mountain areas. In regional development and social science literature about the Alps, the subject is often treated by the analysis of best practices in which authors analyse how the foodway could be a driver for both territorial and sustainable development. But far away to be a linear process, authors also refer to the contrasts and failures. That to say, foodways, and

intangible cultural heritage in general, are at the center of many territorial challenges (Hernández González *et al.*, 2020). The 'reconnection' between local agriculture, food processing and dwellers in rural areas, then, has also been encouraged by public policy, often subjects of studies (Gros-Balthazar, 2022). Funding opportunities derive from the Common Agricultural Policy at national and regional level, such as the Leader programme. For Switzerland, the Regional Development Project have been introduced in 2007 as part of regional policy in rural areas to create value in agriculture. Multinational or transnational projects between European alpine countries and Switzerland are then supported by the Interreg Programme.

My research aimed to give a contribution to the debate on agricultural practices and know-how in the Alps, considering its revitalisation in the theoretical framework of the critical food heritagisation process (Grasseni, 2013; De Sureiman, 2019), and in the renewed interest in the mountain agricultural landscape and the recovery of marginal spaces (Bertolino, 2021) by showing and analysing the example of the cultivation of red berries in the Switzerland region of the Entremont (Wallis, Switzerland). I have studied this as a fellow at the Centre régional d'études des populations alpines in 2021-2022 (CREPA) and at the Laboratory for the History of the Alps (LabiSAlp) in 2022-2023 of the University of Mendrisio in Switzerland.

Figure 1 - Map of the Entremont Region in the Wallis Canton. Personal elaboration



The Entremont region, in the French-speaking part of the Wallis Canton, includes the municipalities of Bourg-Saint-Pierre, Liddes, Orsières, Sembrancher and Val de Bagnes. The region lies on the left bank of the Rhône and includes Val de Bagnes to the east and the Entremont and Ferret valleys to the west. With two ski resorts and many outdoor activities in summer (such as the Mont Blanc tour), the region is very touristic. Farming in Entremont is mountain-based, and mainly focused on milk and cheese production (Dictionnaire historique de la Suisse [DHS], 2011). These niche products also contribute to the agro-diversity (meat, aromatic and medicinal plants, cereals, fruit and honey). However, many of these crops are threatened with extinction, leading to the loss of both biological diversity and local know-how linked to growing and selecting the varieties best suited to the different alpine climates (Tarbouriech, 2004, p. 22).

This is true of strawberry and raspberry cultivation. Having enjoyed a very favorable period for its development from the 1930s until 1990s, this crop is now only grown for home consumption or by a very small number of growers. In addition, while Rhône lowland fruit growing has been studied and documented (Arlettaz, 1976; Thurre, 2013; Tornay, 2013; Lorenzetti, 2014), sources relating to mountain fruit growing and, in particular, red fruit cultivation are scarce (Loup, 1965; Andan, 1965). Starting as a "commissioned" research, I assumed the position of the researcher which is called upon to manage some processes linked to food-heritagisation (Lapiccirella Zingari, 2019), which require the engagement of the local community in order to be embedded in the territories (Gretter *et al*., 2019). In 2021 and 2022, I also had the opportunity to take part in the project *Living ICH - Cross-border governance instruments for the safeguarding and valorization of the Living Intangible Heritage* (Interreg Italy-Switzerland 2014-2020), for which the Centre régional d'études des populations alpines (CREPA) was engaged. The project, concerning the Intangible Agri-food Cultural Heritage in the border regions between Italy and Switzerland, worked on the themes launched by the project *Alpfoodway - A cross-disciplinary, transnational and participative approach to Alpine food cultural heritage* (Interreg Alpine Space 2014-2020), and by the project *E.CH.I. - Swiss-Italian ethnographies for the enhancement of intangible heritage* (Interreg Italy-Switzerland 2007-2013). In particular, the project worked on some alternative food chains, such as horticulture, and still implemented *Intangiblesearch.eu*, an online transnational and participatory inventory on the intangible cultural heritage of the Alps[4], as request by UNESCO 2003 Convention (Unesco, 2003).

4. Related to the subject, the cultivation of red berries has been inventoried: www.intangiblesearch.eu/show_ich_detail.php?db_name=intangible_search&lingua=italiano&idk=ICH-MEB01-0000001795.

1. Materials and methods

The study focused on the past and current extent of red berries cultivation in a mountain region of the Wallis Canton and aimed to design an action-research directed to a possible revival of these crops. The main objective of the research has been the study of the cultivation of strawberries and raspberries as a living heritage and as an economic activity to be sustained and revitalised. The methodology has been based on a qualitative approach to the food heritage (Zingari Lapiccirella, 2019).

The main question has been: What aspects of small fruit cultivation are considered heritage by the community and how they can be act in the renewal of the cultivation?

The first part of the study has been dedicated to the research of historical data, through the CREPA documentation Centre, the online material of the Wallis Canton press, the archives of the State of the Wallis Canton, of the municipalities and of the Martigny and Sion Media Libraries.

After that, an ethnographic fieldwork has been conducted with ancient producers, current producers, other actors in the food chains and local stakeholders. Local actors have been categorized into two groups: primary functions (producers, distributors and local transformation actors) and support functions (category associations, agricultural consortium, cultural associations, schools, local researchers, inhabitants). A total of 23 formal semi-directive interviews have been conducted. The informants were chosen largely by snowball sampling, a specific technique to the social sciences and qualitative surveys where researchers ask the first participants (in this case the first ancient producers interviewed) to identify others who, in their opinion, should/could take part in the study (Goodman, 1961). Interviews have been recording, transcript and analyzed by the researcher by guaranteeing anonymity.

Participatory observation has also been used to document berry picking with the local producers and to evidence the modern challenges given to the economic situation but also to climate change. Field notes have been used to interpretate and analyse the interviews and to build the methodology of the last part of the research.

Finally, a workshop was held in June 2022 with the aim of implementing the governance related to this heritage and outlining possible courses of action for its revalorization.

Informants have been interviewed using an interview guide based on the *Living ICH* project inventory sheet. The interview guide follows the methodology designed at UNESCO level and developed by the community-based online participatory inventory *Intangiblesearch.eu* managed by the Archivio di Etnografia e Storia Sociale (AESS) of the Lombardy Region in Italy.

Figure 2 - Maps of the local actors involved in the research. Personal elaboration based on Google myMaps

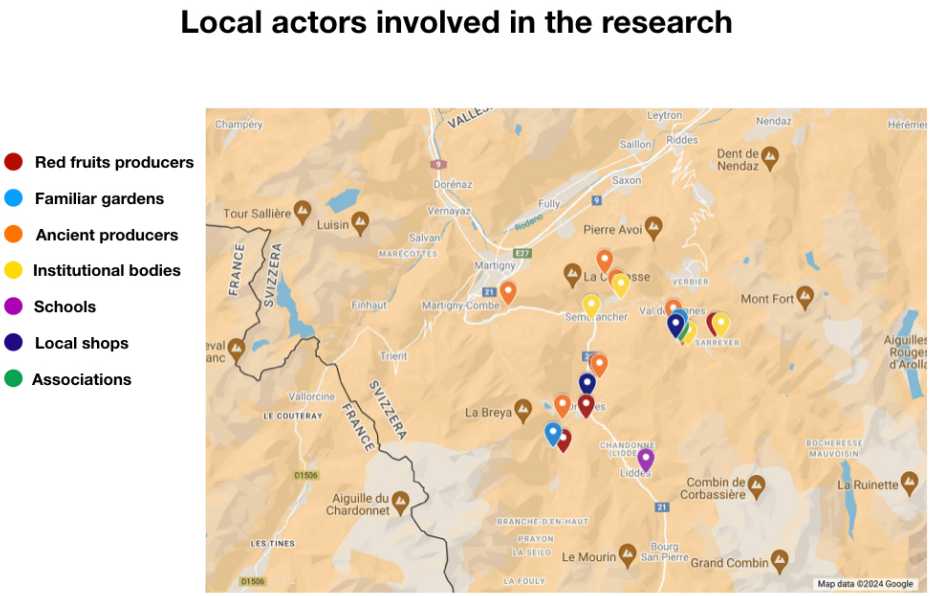


Table 3 - The main topics of the interview guide

The land	Cultivated land (location, size, fragmentation)
	Characteristics of strawberry and raspberry plants and cultivation techniques
	The varieties
	Landscape evolution (changes, if any)
	Management of the strawberry/raspberry cultivations
Production process	Berries seasonal cycle
	Places of production
	By-products (e.g. jams)
Learning and transmission	Collective memory, practices and modalities
	Collective memory: passing on know-how (from generation to generation or between peers) Through what practices and modalities?
	Historical sources

The market	Size and dynamics of the sector
Valorisation, safeguarding and participative governance	Actions to promote and safeguard the past history
	Innovations and possible revival
	Threats and risks

The next part of the paper would be an empirical narrative of the three phases in which this research-action has been conducted trying to interconnect the analyses with the sustainable challenges, launched by Slow Food among others.

2. Results

Historical background

Until two centuries ago, red berries grew wild in Switzerland and were only picked in forests, along hedges or at the edge of fields. In fact, it was only at the end of the 19th century that cultivated varieties appeared in gardens and became part of the Alpine landscape (Tarbouriech, 2004). Today, red berries – especially strawberries and raspberries – are produced in many parts of the Wallis Canton, notably in the Rhône plain, as well as in other cantons (IFELV, 2019; AGRISTAT, 2021). The Swiss production is mainly aimed at the local fresh market and is based on the high taste quality of these fruits (Carlen *et al*., 2011). Strawberry cultivation was introduced in the Entremont since the late 1920s. In 1927, the municipality of Bagnes helded two conferences. The first was given by Mr Laurent Neury, professor of agriculture at the École Cantonale d'agriculture de Châteauneuf (Le Nouvelliste, 1st march 1927), and the second by the director of the *Fabrique de conserves* de Hallau, who convinced the audience that strawberry cultivation should be possible and even advantageous in the valleys (Le Nouvelliste, 17 march 1927). Trials were recommended for the varieties to be chosen. During this period, a significant role was played by the *Fabrique de conserves Doxa* in Saxon, set up in 1887. It initially sourced raw materials from outside the canton, then set up a «syndicat», which undertook trials to determine the best varieties for sale and canning (Loup, 1965). After few years, strawberries had not only found fertile ground in the Val de Bagnes but also in the Val d'Entremont where Orsières became a major production centre in the 1960s (Le Nouvelliste, 6 july 1963).

The picking was organised by the *Syndicats des fraises* or *Syndicats de fruits et légumes* (strawberry or fruit and vegetables trade union), born in almost every village from the 1930s onwards. (Luisier, 1997). Basically, a «syndicat» is a form of professional organisation based on an association of workers in the same or similar professions who come together to better defend their interests. The first task of a «syndicat» is to negotiate the price of fruit. But it does not stop there (Le Confédéré, 12 june 1931). In the «syndicats», the workers manage their own farms, but they agree on the management of the sale and delivery of the products, the maintenance of the fields, the watering and the treatments to be carried out, by paying an annual sum.

The organisation of a «syndicat» requires a president and a secretary for each village. The members are convened once a year in a general assembly, and thematic meetings follow during the year. In addition, in each village, a person must always be hired to ensure that the picking period runs smoothly. At that time, the «syndicats» are attached to the *Union valaisanne pour la vente des fruits et légumes*, founded in 1934, which guarantees sales (Le Confédéré, 6 june 1938). The organisation in «syndicat» is well remembered by the inhabitants, but the majority of them lasted until the 1980s/1990s, when the production of strawberries and rasberries on a large scale decreased considerably in the Entremont Region.

From the 1930s to the 1970s, strawberry cultivation enabled many families in the region to significantly improve their income (Besse, 2020). During this period, strawberries were widely recognised and exported beyond the canton and even beyond national borders. Later, raspberries gradually replaced strawberries with the same success. In the 1970s, raspberries are mentioned as a cultivation for the market in the mountain regions of Isérables, Veysonnaz (both outside the Entremont), Orsières and Bagnes with 1/3 of the total production in the Canton (La Terre valaisanne, 15 march 1976).

Furthermore, in order to help local producers and to carry on tests and studies on the crops in mountains, the Federal Research Institute Agroscope has run the experimental station on the red berries in Bruson (Municipality of Val de Bagnes) at 1100 meters a.s.l. for more than a decade since the late 1990s (Journal du Valais, 21 april 1978).

However, the production in the mountain regions has steadily declined since 1970s (see Table 4).

The main causes, also following the interviews, have been: the decline in the profitability face of international competition and lowland plantations (Le Nouvelliste, 29 june 1972); the decline in mountain agriculture because of the industry and of the winter tourism (Vallat, 1965); a change in the distribution of the wage labour within families, with the abandonment of the single-income derived from agriculture, with the turn of the men into the so-

Table 4 - Historical series of the evolution of the strawberry cultivation in m^2 in the Entremont municipalities. Source CH AEV, 3250-2014/14, 10.2 Fraises, baies et petits fruits de montagne, 1960-1993 (Dossier) (Archives de l'État du Valais)

	1962	1967	1976	1982
Bagnes	199,681	120,000	12,129	4500
Vollèges	95,799	86,000	22,036	600
Sembrancher	28,400	20,000	6,903	3000
Bovernier	163,778	155,400	27,832	10,000
Orsières	462,853	280,000	82,488	12,150
Liddes	1270	insufficient data	insufficient data	insufficient data

called "paysan-ouvrier" (peasant-workman). The agricultural tasks were taken by the women, allowing the maintenance of the "famille-paysanne" (peasant family) (Vouilloz Burnier, 2022). Last but not least, the strawberry variety Mme Moutot, which was the only one since the 1960s, started to suffer because of some deseases (Andan, 1965) and it was abandoned. The introduction of other commercial varieties caused the change of the main centres of production, such as the Entremont, in favour of other valleys (La Terre valaisanne, 15 may 1983).

Although these crops were once fundamental to the economy, culture and landscape, few farmers remain custodians of an agricultural know-how that has characterised the region on a large scale. Despite that, many inhabitants recognize the cultivation of strawberries and raspberries as part of their past and heritage, while others are interested in a renewal of the crops.

The current situation of the red berries cultivation

The transmission of this history and of the know-how related to the cultivation of berries have always take place within the family. Those who still produce for sale have inherited the fields and the knowledge of plant management from previous generations (parents or in-laws) and in turn try to pass it on to their children. It should be noted that in the past, cultivation was practised by both men and women. As the interviews show, when mountain communities entered the era of dual employment in the 1950s, men found employment in the tourism industry, construction, public works and factories. Harvesting became "feminized". The men were then engaged in paid work and could no longer devote themselves to picking, but they still maintained the labour of the plots. For women, farming became a full-time job. When

production for sale began to decline in the 1980s and 1990s, families continued to manage the gardens and fields for family consumption. Many of them passed on the know-how to their daughters and daughters-in-law. As a result, women are now the ones with the knowledge of managing, picking and processing berries.

The cultivation of berries is now reserved for self-consumption or guaranteed by a very small number of producers. These are women who still produce small quantities for sale, especially raspberries, but who are not professional farmers. None of them are inscribe to professional unions, so they don't appear in official statistics of production. For them, red berries cultivation is a side job to their work or retirement that keeps them busy in June and July for the picking and throughout the year for the maintenance of the strawberry and raspberry plants.

Many inhabitants preserved some rows of strawberries and raspberries of the ancient variety in their own private gardens, which become places of conservation, safeguarding and valorization of a domestic biodiversity. This latter «constitutes a wealth that is mobilized today for heritage purposes, but also for food policies and adaptation to climate change» (Guiraud *et al*., 2022).

However, the landscape has now changed. The fields have been turned into meadows for mowing – as dairy farming is the main agricultural industry in the region as well as in the Swiss in general (Zorn & Zimmert, 2022) –, or for the cultivation of officinal herbs (La Terre valaisanne, 15 may 1990). Despite that, there is a continuity with the past, a thread that has never been cut. The producers, who still have crops of sufficient size to sell berries, have perpetuated a family tradition. In two cases, it is an activity that they learned with their in-laws in the 1990s, when they moved to their husbands' village and left work to look after the children. It was at this time that they started to help in the fields. Their parents-in-law or parents were part of the generation that had experienced the strawberry boom and they were children when they had to help their parents in the fields. For this reason, even if strawberries and raspberries are no longer profitable:

I've been growing raspberries since I moved here (*to Reppaz, a village in the Commune of Orsières*) with my husband. I come from Liddes and my parents-in-law were already growing them. I learned from my parents-in-law. It's often the same varieties, we've always put back the same ones, the variety is called Glen Ampel;

I haven't come from the village here (Issert, a village in the Commune of Orsières), my husband comes from here, but my parents had raspberries in Orsières. I've always seen my parents do it, I know how to treat them. Once, everyone had to help, the adults would pick and the little ones would carry the baskets, so they could see and learn how to do it.

These women have not only inherited a passion, but also the same plants. In some cases, the raspberry plants are 40 years old. In other cases, they are varieties tested by the Agroscope Experimental Station in Bruson. People from the region used to go to this village in the Val de Bagnes to buy varieties. They also went there to attend training days or to do trials. The Station was a real reference for the red berries producers of the region, but it later converted its production to officinal plants. The varieties were selected to grow at an altitude of 1000 meters and to resist cold, wind, spring frost and hail.

Today, there is a major difference with old practices: chemical products are now banned. If the old ones treated a lot, nowadays the producers try to produce as naturally as possible.

Picking season starts at the end of May for strawberries and at the beginning of July for raspberries. Red berries are harvested three days a week in 500 grams baskets and sell the same morning so that they don't rot.

In the past, strawberries and raspberries were sold to grocery shops, confectioners and hotel chefs in Verbier (Le nouvelliste, 12 august 1998). Now, only one producer sells to a bakery that makes pastries with the fresh product. She delivers them herself. The others sell to private. All the producers note that there is an increase in demand. It is word of mouth that allows people to get to know the producers. One of the reasons for the increased demand is the price per kilo, which is competitive with the products in the supermarkets. According to one producer, there is also a certain appetite for local and mountain products:

> In terms of consumers, they understand the difference with the plain. For a very long time we didn't change the price per kilo, I used to sell 11 Frs. per kilo, and then the years that my father-in-law was there he used to say "no, no, you mustn't increase it", then two years ago a woman said to me "you must increase the price, your products are of good quality", so last year we went up to 13 Frs. and I told people "you know I increased the price, it would be 13 Frs.". They said "it doesn't matter, don't worry, you've done very well, you don't pay as much as when you go to the shop and you know where it comes from".

Although producers are facing a shortage of available product, the increase of the production would be difficult for them. Indeed, they exploit plots of 200-300 m^2 which require a lot of work.

The planning process with the local stakeholders

In the last phases of the research, a workshop with different stakeholders (inhabitants, farmers, food companies, politicians, an organisation for the

valorisation of the mountain agriculture, teachers, etc.) has been held in order to exchange about some paths for a revival of this cultivation.

During the discussion, three sectors have been investigated: production, transformation and education/transmission.

Nowadays, the production for sale is residual in the panorama of red berries production in the Wallis valleys, particularly to the benefit of the lowland regions. However, stakeholders agree that mountain agriculture could benefit from the positive image and appeal that it has on consumers today. It could also contribute to an economic surplus value on the final product (fresh or processed), besides a remuneration at a correct price in the production chain.

The demand for local berries is increasing as consumers are more and more sensitive to the origin of the product. As many people still have the knowledge of processing the fruit into syrups or jams, there would be no problem in creating a B2C chain (direct sale of fresh fruit for consumption or processing, both to locals and tourists). 2nd or 3rd choice fruits, which are not easy to market, could be also used in local processing companies (fruit juices, jams, syrups, liqueurs, ice-creams, etc.) and for innovative products, such as the use of red berries to flavour beer, dried fruits, and energetic bars. Beyond that, the motivation of producers is fundamental for the sustainability of the sector and the transmission of know-how. As far as red berries are concerned, the producers and inhabitants of the region recall a very hard period of work (especially for strawberries), which means that innovative solutions must be found for cultivation.

Among the difficulties for developing new cultivations in mountains, there are: the strong price competition with strawberries from the plain and from abroad and a certain delay in the production of the mountain strawberry which arrives later on the market, when other fruits are available (e.g. the Wallis apricot). It seems that, by this time, the consumer's desire for strawberries has already been exhausted, as it was previously satisfied by the availability of foreign strawberries since March on the supermarket shelves. But this could also be an asset, as it would allow a longer production period, not competitor of Wallis strawberry from the plain, while extending the offer of a local and mountain product.

Another point of weakness is the competition with officinal herbs, which have been established in the area for a long time. In fact, this is a very profitable crop that competes with the project to revive strawberry and raspberry cultivation, especially with regard to the availability of land.

The availability of land is another problem. Meadows for fodder and cereal fields for animal consumption (maize and triticale) are still preferred by the dairy farms, which are also under the specifications of the Valais Raclette AOP cheese production.

For this reason, some stakeholders suggest the possibility of a community-based land management, reconsidering the role of the ancient "syndicats the fruits". This is particularly felt by new inhabitants and new organisations which are working on the revival of marginalized areas, as in other countries of the Alps (Bertolino, 2021)[5] and abroad (Ravazzoli *et al.*, 2021).

Finally, all the participants are aware of the importance of local self-sufficiency, regenerative agriculture, organic approach to food production, quality soil and seeds. At the same time, local intangible cultural heritage is more and more used in formal and informal education (Labrador, 2022). Participants suggest to develop some awareness-raising project with primary schools of the region, both to have a "field to table" approach and to allow the intergenerational transmission of knowledge and know-how to continue[6].

4. Discussion

Each phase of this research-action could be aligned to the sustainability criteria and the slow food principles shown in Table 2. Both the historical background, the current situation of the cultivation and the planning process started could be a levers to enhance a local food system which is good, because it is healthy and socially and culturally adequate; clean, because it is being adapted to environmental changes; and fair, because it sounds ethic in its intergenerational exchanges, in the solidaristic form and in the biodiversity inherited by the past, and economically viable in the consumers' awareness of the fair price.

As for many other Alpine communities, the example of the Entremont shows that the safeguarding and valorisation connected to food «keep productive supply chains alive in the contemporary market while informal and living social activities are evidence of a strong commitment of the social groups and individuals to keep alive and transmit spiritual and cultural values» (Zingari Lapiccirella, 2019).

5. So today, it is also necessary to consider the protagonists of the "ascending" demographic flows (i.e. the new inhabitants of the mountains) who often become knowledge holders by choice (and not by birth) through a multi-level and multidimensional transmission of tradition.

6. In this regard, a project about community gardens in the schools of the region founded by the *Etat du Valais* has been launched in February by CREPA and HEP.SO. The first experimental community garden has been inaugurated during the scholar year 2022-2023 in Liddes and presented to the population in June 2023.

Table 5 - Interconnection between the principal research results and the Slow Food position paper

Results of the 3 research phases		***Sustainability criteria and Slow Food principles***					
		Healthy food systems	**Socially and culturally adequate**	**Environmentally friendly**	**Resilient**	**Ethically sound**	**Economic viable**
HISTORICAL BACKGROUND	Ancient varieties adapted to mountain terroir			X	X		
	Collective memories		X		X	X	
	Solidaristic forms of management		X		X		X
CURRENT SITUATION	More natural cultivation methods	X			X		
	Familiar gardens	X	X		X	X	
	Intergenerational exchanges		X		X	X	
PARTICIPATORY PROCESS	Interest in local production	X	X	X			X
	Informal education	X	X		X	X	

More specifically, food and the process of heritagisation become a marker of contemporary socio-cultural, economic, spatial and ecological changes in rural mountain territories (Whited, 2018). Intangible cultural heritage in alpine regions, in general, is seen as a possible way to regenerate rural economies and revitalize territorial system (Nemac & Pelvac, 2019) as other case-studies and best practices evidence (Rinallo *et al*., 2021).

The research revealed a general interest in the reviving of strawberry and raspberry cultivation as local heritage to create alternative food-chains.

However, the complexity of the territory reminds that it has to be considered the modes of relationship and interaction between the system of actors, the economic context and legislation.

To resume this complexity, a SWOT analysis (see Table 4) has been drawn up to highlight the strengths, weaknesses, opportunities and threats of strawberry and raspberry cultivation in the Entremont region.

The cultivation benefits from the fundamental contribution of women producers and private individuals for the preservation of certain species of red fruits in mountain, for which consumer demand has been growing steadily. Particularly in the past, strawberry fields have contributed to the economy of the region and to the image of the area, both in terms of landscape and smells, contributing to a strong identification between the practice and the local environment. The presence of the Agroscope Station has meant that some varieties have been selected on the basis of their best adaptability to the temperatures, sun exposure and soil characteristics of the area, which vary between the respective altitudes.

In spite of the growing demand for mountain red fruits, the market has been progressively declining, as it is an occupation entrusted to a very small group of pickers, who devote themselves to it for passion or as a secondary activity. Also, the transmission of knowledge is at risk. According to the interviews, it is possible that the current gatherers are the last custodians of these practice. Red fruit cultivation requires a lot of care all year long, that is impossible to combine with a full-time job. In addition, the seasonality of the picking determines a single intensive harvest time, which occurs between the end of May and July, limiting the availability of products to a very short period. The perishability of red fruits is another weak point which requires a quick delivery on the same day of the picking.

Some important opportunities for the small-scale mountain cultivations are to be found in the willingness of the producers and of other stakeholders to work in a network and to restore associative and mutual forms of management of the red fruits cultivation.

An important role could be play by the PDR Grand Entremont (Regional Development Plan), as yet play for other food-chains, e.g. the cereals[7]. With the enhanced of the territorial label "Le goût des cimes", the PDR Grand Entremont works for the engagement of local producers, the valorisation of local agricultural products and the networking with the different stakeholder of food (e.g. restaurants and agritourisms). As McMorran *et al.* (2015) state for the European alpine countries, «a mountain-related labelling offers

7. www.grand-entremont.ch/fr/les-produits/farines-et-pains.

significant potential for supporting the development of marketing channels for mountain food products. The specific characteristics of these products, linked to the qualities of the mountain environment and/or their production methods, give them a particular value as high-value niche products» (p. 4).

In addition, the growing demand for mountain products could act as a factor stimulating supply, encouraging young producers to enter the sector and introducing innovations in cultivation methods, e.g. above ground. This would not only expand the supply of products, which are recognised as being of high quality, but could also increase yields and overcome problems of land availability.

The main threat is climate change and the competition for land. In addition, the low price on the market makes small-scale mountain cultivation uneconomic.

Other studies (agronomic, economic, marketing) could provide useful information and help to answer questions such as: How many owners of open land would be potentially available to lease their land to agricultural entrepreneurs wishing to dedicate themselves to these cultivations? What forms of cooperative organisation could be successful? What market demand might there be for these products? How could added value be created for mountain and local products (labels, links with the Festival, distribution and sales channels)?

Tabella 5 - Swot analysis of the red fruits cultivation based on the results of the research

Strengths	Weakness
Presence of family gardens that preserve ancient varieties that are well adapted to the temperatures and soils of the area	Harvesting practised by a small group of women producers who do it as a secondary activity
Cultivation practice that was once widespread and whose memory is still alive, as it is also linked to a time of well-being and prosperity	Transmission of knowledge at risk
Increasingly natural production	Seasonality of harvesting (intensive time between the end of May and July requiring the help of friends and family)
The presence of the Conthey Agroscope Station and its experience in the field of berries	Plants and soils that require a lot of care throughout the years
	Absence of b2b sales channels

Opportunities	Threats
Possibility of land management of farms for community management	Weather conditions: spring frost
New method of cultivation (soilless)	Competition from the plain (lower price) for fresh produce
Production that complements that of the plains, as it comes later in the mountains	The primary sector of the economy no longer sees many people hired on a full-time basis
Interests in the transmission of local know-how and practices by local cultural associations (informal context) and schools (formal education)	Different interests on open land (introduction of crops versus meadows to make hay for livestock)
An increasingly popular mountain product on the local market (short local supply chain) after Covid 19 and internationally (tourism in the Val de Bagnes)	

5. Concluding remarks

The article explores the dimension of local agricultural practices and food as living heritage and their link with some of the anthropological phenomena which are affected the Alps, as the returns to agriculture and to some more respectful practices in these fragile territories. In addition, the example of the red fruits cultivation in the Entremont Region shows some intents to reach a sustainability model in agriculture in alpine countries as Switzerland (Département fédéral des affaires étrangères [DFAE], 2018). The heritage dimension of agricultural know-how is therefore now based on social and ecological functions that can be summed up in three points. Firstly, the Alpine food heritage has become part of political discourse (Derèze, 2005) and of the contemporary practices of "communities of practice" (Council of Europe, 2005). In the Entremont region, families have continued to manage the gardens and fields for family consumption, and many of them still use the ancient varieties of red fruits. Today, the gardens are places where strawberry seedlings and raspberry rhizomes are exchanged between generations and cultures. This practice concerns both old and new mountain dwellers. Secondly, the living traditions of the Alpine food heritage and the "natural" environment are interdependent (Wiedmer, 2018; Tornatore, 2019b). The heritage of food-related practices is a framework for ecological crisis. The old varieties of strawberries and raspberries still kept in private

gardens show how communities of practice are not only the guardians of seed biodiversity but also how, through their new ways of growing crops at altitude, they are building niches for bottom-up experimentation that can anticipate the major issues linked to climate change. Thirdly, the specific case of berry crops reveals elements linked to the notion of transition. There is an idea of "passage" from one state to another where something happens in between. This notion also incorporates the idea of discontinuity and rupture with the existing state, which leads to phenomena of the deconstruction and re-composition in the cognitive, affective, and structural domains (Tapia, 2001). Communities of practice are aware of the heritage value of their know-how, which is part of the mountain farming tradition. But by acting through practices, they do not fix the Alpine food heritage in the past. On the contrary, they are renewing it as a resource that generates new responses to future challenges (UNESCO, 2021).

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A Social Practice Perspective of Ireland's Lobster Cultural Food Heritage

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Abstract

The research examines integrating the Slow Food Movement (SFM) with Ireland's lobster industry, emphasising preserving local culinary heritage as crucial for Sustainable Food Systems. This heritage includes both tangible elements, like agricultural practices and intangible ones, such as traditional food preparation. Slow food aims to protect these traditions from the homogenisation of food production. Using Social Practice Theory, the research analyses lobster consumption in Ireland, underscoring its symbolic importance in Irish culture to develop a novel framework adapted from the Social Practice Framework. The study combines qualitative interviews and secondary data analysis to explore lobster's role in Irish culinary heritage and its potential for promoting sustainable seafood consumption. Results from the study highlight the critical role of Irish lobster fishing communities in maintaining cultural food heritage, with traditional practices contributing to ecological and economic sustainability. The SFM influences lobster consumption, supporting sustainable and culturally important food practices. This research underscores the intricate link between tradition and sustainability, suggesting a model to balance cultural integrity with sustainable practices, contributing to a more culturally informed and environmentally conscious food consumption approach.

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Introduction

The emerging Slow Food Movement (SFM) as a pivotal ideology, advocating for accessible, healthy food and equitable treatment of producers, resonates deeply with contemporary issues like supply chain dynamics, sustainability, biodiversity, monoculture farming and preserving cultural heritage (Cacciolatti & Lee, 2022). Cultural heritage, encompassing both tangible and intangible elements of a society's legacy, plays a fundamental role in shaping community identity and continuity (Bujdosó *et al.*, 2015; Demetrescu *et al.*, 2020; Olsen, 2022; Vecco, 2010). In Ireland, preserving Cultural Food Heritage (CFH) encounters various challenges stemming from societal and environmental changes, reflecting the country's developing historical, cultural and economic landscape (Adelman, 2017; L. Clarkson & M. Crawford, 2001; L.A. Clarkson & E.M. Crawford, 2001) alongside the impact of globalisation (Agyeman & Simons, 2016; Deleuze, 2012); homogenisation of food cultures (Kelleher *et al.*, 2002); acknowledgment of sustainable agricultural practices (Gafsi & Favreau, 2013; O'Donovan *et al.*, 2012) and the growing trend for buying local produce (Friel *et al.*, 2006; Kazimir *et al.*, 2012; Mulcahy, 2012; Wilson & Whitehead, 2012). Recent trends emphasise artisanal, local, traditional, seasonal and sustainable foods in maintaining and adapting traditional food practices (Mac Con Iomaire & Ó Laoire, 2021; Murphy, 2021).

The array of studies focusing on lobster fishing and sustainability unveils a complex landscape of challenges and strategies pertinent to global lobster fisheries. Phillips and Melville-Smith (2005) offer a critical analysis of the Western Rock Lobster Fishery, underscoring comprehensive management controls and compliance to ensure sustainability. Advocating for sustainable fishing methods, Goodman *et al.* (2021) endorses habitat enhancement and adopting appropriate fishing gear to reduce sea waste. Highlighting the impact of external factors, Greenan *et al.* (2019) examine the socio-economic vulnerabilities of American lobster fisheries to climate change, stressing the precarious balance between environmental health and community livelihood. The research by Ebel *et al.* (2018) in Maine reveals signifying trust in cooperative fisheries research, pointing to needing collaborative efforts in sustaining lobster populations.

Further expanding the sustainability discourse, Barnett (2018) integrates socio-economic factors into fisheries management, using a Nova Scotian case study demonstrating this approach. The innovative study by Conrad and Danoff-Burg (2011) investigates lobster houses as a sustainable fishing alternative, suggesting their potential benefits under specific conditions. On the environmental front, Farmery *et al.* (2014) evaluate the ecological footprint of the Tasmanian southern rock lobster supply, scrutinising the

influence of management decisions on the industry's sustainability. In the Indonesian context, Wardiatno *et al.* (2020) and Reztrianti *et al.* (2023) address the challenges and strategic management approaches necessary for the sustainable operation of lobster fisheries. Steinback *et al.* (2008) conclude with a bio-economic analysis of the American lobster fishery, indicating significant outcomes from modifying fishing efforts. These studies collectively emphasise a nuanced understanding of lobster fishing sustainability, highlighting the need for integrated approaches that consider ecological, economic and social dimensions.

This study, utilising Social Practice Theory (SPT), investigates lobster consumption in Ireland, highlighting its cultural significance and exploring its integration within the SFM and Sustainable Food Systems (SFS). SPT, which views practices as fundamental to social life (Bourdieu, 2020; De Certeau *et al.*, 1980; Giddens, 1987), provides a lens to understand intergenerational knowledge transfer (Kuyken *et al.*, 2018; Murphy, 2012); community identity (Barlocco, 2010; Bennett, 2013) and evolving traditions (Dahlin & Svensson, 2021). In this unique context, the study employs a novel adaptation of the Social Practice Framework (SPF), focusing on the symbolic role of lobster in Irish culture and its potential to promote sustainable seafood consumption. This approach offers new perspectives on the interplay between CFH, SFS and the SFM, contributing distinctly to the field by unravelling the complex relationship between cultural heritage and sustainable food practices. Through this lens, the study aims to enrich the discourse on sustainable fisheries management and policy-making, addressing the intricate dynamics of the Irish lobster industry.

Despite lobster's cultural significance in Irish communities, its consumption is notably low, a trend this research aims to understand. The study investigates the underlying reasons for this resistance to a sustainable food source and assesses the potential for increased lobster consumption in the Irish diet. Central to this enquiry is: *"How do the social practices of Irish lobster fishing communities contribute to preserving cultural food heritage and sustainable lobster consumption?"* (RQ1). Employing a qualitative research design involving interviews with 37 individuals, supplemented by secondary archival research, content analysis and historical data, the study also explores: *"What are the key competences and material elements that shape Irish lobster fishing sustainability practices contributing to the economic viability of coastal communities?"* (RQ2). The research finally examines: *"What role does the Slow Food Movement play in shaping the practices and behaviours of Irish lobster consumers, and how does it contribute to the broader sustainability of the lobster industry?"* (RQ3), highlighting the interplay between lobster consumption, cultural heritage and sustainable practices.

1. Background

The SFM, a global grassroots initiative, champions the ethos of providing good, clean and fair food for all, emphasising producing delicious, high-quality food that respects both the environment and those who cultivate and prepare it (Chrzan, 2004; Gaytán, 2004; Notaras, 2014). Integral to this philosophy is recognising food selection as a complex behaviour influenced by various factors, including taste and sensory preferences (Aliani *et al*., 2013a; Forsberg *et al*., 2022); cultural and social influences (sociodemographic) (Axelson, 1986); nutritional value (Aliani *et al*., 2013b; Leathwood & Ashley, 1983); convenience and accessibility (foraging) (Hughes, 2013); advertising and marketing (Muñoz-Leiva & Gómez-Carmona, 2019); health concerns and dietary restrictions (Hirakawa, 1997; Penry, 1993) and environmental and ethical factors (Tivadar & Luthar, 2005). Nelson (2013) elucidates that in the contemporary Irish diet, decision-making transcends age, gender or class, often driven by historical cultural influences and challenging conventional health promotion strategies.

In recent years, there has been a noticeable pivot towards a 'foodie' culture and healthier, locally sourced foods in Ireland, a shift partly influenced by modernisation, globalisation and the principles of the SFM; yet, access to these healthier options remains disparate across social classes (Deleuze, 2012; Friel *et al*., 2006; Murphy, 2021). The slow food focus on traditional Celtic cuisine, with its low-fat profile, contrasts with prevailing fast-food trends and holds the potential for promoting healthier eating habits (Campos, 2004; Galli & Degliesposti, 2012; Tam, 2008). Critiques of the SFM highlight perceived mismatches with the realities of modern fast-paced societies and question the movement's capacity to substantially challenge the dominant fast-food industry (Hsu, 2015; Jones *et al*., 2003).

Culinary heritage, an essential component of cultural identity, is preserved through traditions, ingredients and cooking practices that significantly contribute to cultural expression and tourism, while also shaping slow food systems (Almansouri *et al*., 2021; Gyimóthy & Mykletun, 2009). This concept extends to food as an element of intangible cultural heritage, serving as a marker of social identity (Counihan, 2016; Maffei, 2012; Partarakis *et al*., 2021). The SFM's exploration of food as a part of local heritage calls for enhanced recognition of the roles of producers and communities (Badii, 2013; Van Esterik, 2006). Understanding Ireland's dietary evolution necessitates a historical lens; socio-economic factors largely shaped the pre-modern Irish diet, with staple foods like pork and stews prevailing among the lower classes, in contrast to the aristocracy's more diverse and balanced diet (Flavin, 2022; Gentilcore, 2015; Keenan, 2013; Knapp, 1997). The introduction and subsequent reliance on potatoes, driven by affordability and

ease of cultivation, significantly impacted Irish dietary patterns, particularly during and after the Great Famine, with lasting effects still evident in modern dietary preferences (Adelman, 2017; L.A. Clarkson & E.M. Crawford, 2001; Fitzgerald, 2017; Kee, 1993; Powderly, 2019; Solar, 2015).

Recent scholarly work on lobster fishing and consumption sustainability presents a diverse analysis across socio-economic, environmental and governance spheres. Lowitt *et al.* (2020) emphasise integrating small-scale fisheries into Canada's food system governance, advocating for community-inclusive sustainable policies. Karnad *et al.* (2021) critique India's seafood regulations, proposing a community-centred 'seafood commons' framework for sustainable tropical fisheries. Proposing a shift towards large-scale commercial aquaculture, Jeffs *et al.* (2020) envision it to alleviate the pressures on wild lobster populations. Other scholars draw attention to the significant economic impacts of abandoned fishing gear (Goodman *et al.*, 2021); drawing attention to the need for sustainable business practices (Reztrianti *et al.*, 2023) and collective community actions that can promote lobster industry sustainability (Hai & Speelman, 2020; Priyambodo *et al.*, 2020). A sample of lobster sustainability literature is found in Table 1 below.

Transitioning to a focus on sustainable lobster consumption, Spanier *et al.* (2015) provide insights into the historical context of the commodity, signifying lobsters as a fundamental resource for coastal communities while also highlighting the contemporary challenge of overfishing. Yan and Chen (2015) shift the focus towards exploring the underutilised potential of crustacean shells, given the increasing consumption patterns of shellfish, advocating for adopting more sustainable industry practices. Notably, Charlebois *et al.* (2024) explore the psychographics of Canadian consumers, establishing connections between dietary choices and socio-economic factors. Other scholars advocate for greater sustainability in the industry (Goyert et al., 2010), often because of the challenges brought by tourism consumption behaviours (González, 2019; King, 1997). In terms of perceptions of lobster, Wallace (2005) and Eliot (1915) provide cultural critiques, juxtaposing the symbolism of lobsters across different social classes. A sample of articles evaluating the sustainability of lobster consumption can be found in Table 2 below.

The discourse within this literature review illuminates the multifaceted dimensions of sustainability and practices concerning global lobster consumption, underscoring the necessity for comprehensive academic research. The integration of various geographical contexts, from Canada to Vietnam, highlights the diversity of ecological, economic and cultural factors influencing lobster fisheries and consumption patterns. This global perspective reinforces the need to extend such studies to regions like Ireland, where lobster consumption behaviours remain less explored. Investigating

Table 1 - Sample of Studies Focusing on Lobster Industry Sustainability

Author	Cited*	Sample	Country	Findings Summary
Lowitt *et al.* (2020)	25	Four Case Studies	Canada	Emphasises on incorporating small-scale fisheries into food system planning and governance, advocating for policies and structures that support sustainable practices and community involvement in decisions.
Karnad *et al.* (2021)	11	531 Consumers 400 Restaurants	India	Current seafood regulations and certifications have mixed impacts on tropical fisheries, emphasising the need for a 'seafood commons' approach based on community involvement and consumer awareness to enhance sustainable management in the Global South.
Jeffs *et al.* (2020)	6	Book Chapter	Global	Emerging large-scale commercial aquaculture for marine lobsters in the coming decade is expected to offer an alternate source, potentially easing the fishing strain on wild lobster populations.
Goodman *et al.* (2021)	49	Secondary Data	Canada	The Nova Scotian lobster industry faces commercial losses of $175,000 CAD annually from abandoned, lost and discarded fishing gear with five of 15 trapped species were at-risk and 67% were a marketable size.
Reztrianti *et al.* (2023)	0	15 Interviews	Indonesia	To achieve sustainable business practices, it is essential to enhance employee awareness, improve financial resource allocation and foster strong collaboration among the government, entrepreneurs and local communities.
Hai and Speelman (2020)	39	353 Lobster Farms	Vietnam	Enhancing the efficiency of input use in Vietnam's marine cage lobster farms results in reduced production costs and improved environmental outcomes, which alleviates environmental stress and boosts economic performance.
Priyambodo *et al.* (2020)	46	2,441 Puerulus Fishers	Indonesia	If fisheries policies are updated and a regulatory framework is put in place, Indonesia's settling puerulus could sustain a lobster aquaculture industry, potentially producing over 12,500 tons of market-size lobsters.
Elsler *et al.* (2022)	4	99 Small Fishery Co-op	Mexico	In Mexican lobster cooperatives, robust collective efforts lead to sustainable fishing practices and advantages in international trade, all while maintaining healthy lobster populations.

These studies are centred around the sustainability practices and impacts within the lobster industry.
* Google Scholar.

Table 2 - Sample of Studies Focusing on Sustainability AND Lobster Consumption

Author	Cited*	Sample	Country	Findings Summary
Spanier *et al.* (2015)	44	Overview	Global	Historically, lobsters were a significant food and economic resource for early coastal communities, sustainably harvested before European contact. Overfishing and smaller lobster sizes have since resulted in overexploitation in many regions.
Yan and Chen (2015)	926	Conceptual	N/A	Millions of tonnes of crustacean shells are discarded globally yearly, despite their potential as a sustainable resource for products like animal feed and fertiliser. There is a need for better utilisation and sustainable practices in the seafood industry.
Charlebois *et al.* (2024)	0	869 cross-national participants	Canada	Factors like vegan diet preference, marital status, past lobster purchases, consumption frequency, price perception and support for the Canadian economy influence consumer preferences for lobster.
Goyert *et al.* (2010)	107	17 Dealers 59 Harvesters	USA	Enhancing traceability and financial benefits for fishermen in MSC certification could increase consumer interest in sustainable Maine lobster, showing a need for adaptable sustainability-focused differentiation.
King (1997)	30	Undisclosed # of Interviews	Belize	Tourism growth has led to increased harvesting of undersized lobsters, mainly for household use and selling to tourist-focused restaurants. This practice puts a larger strain on the lobster population as tourism expands.
Wallace (2005)	387	Book	N/A	Lobster is often regarded as a hallmark of luxury and opulence.
Eliot (1915)	743	Poetry	N/A	The lobster is depicted as a lower-class commodity, contrasting its modern perception as a luxury, reflecting themes of social status and class.
Barrento *et al.* (2009)	50	Nutritional Analysis	N/A	The edible parts of both European and American clawed lobsters are rich in protein and essential amino acids; a nutritious and healthy dietary choice.
González (2019)	2	Book Chapter	Nicaragua	Highlights the dangers and management problems in lobster diving driven by tourism consumption behaviours, requiring greater law enforcement.
Townsend (2012)	18	Book	N/A	Evolution of lobster consumption from fertiliser to the dinner plate.

The table presents studies that specifically investigate the intersection of sustainability and lobster consumption.
* Google Scholar.

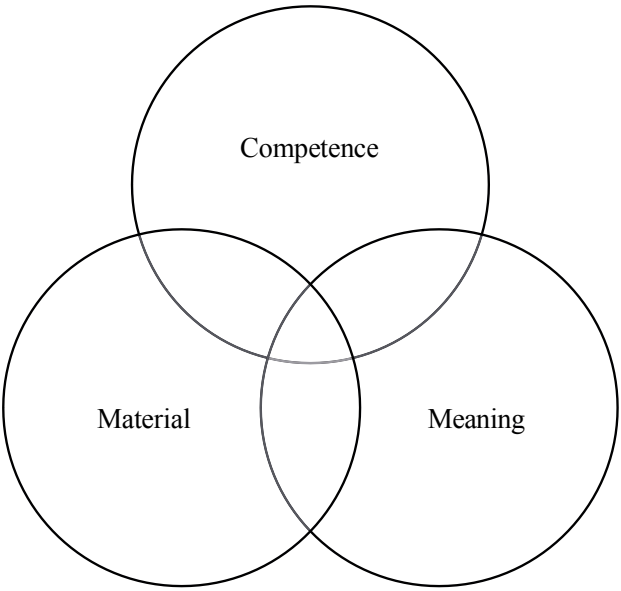
these patterns in Ireland could provide crucial insights because of its unique socio-economic and cultural context, potentially contributing to a more nuanced understanding of global trends. The ability to infer and extrapolate this knowledge to a global scale could aid in formulating more effective, culturally sensitive and sustainable lobster management and consumption strategies worldwide. This approach advocates for a holistic research agenda that not only addresses localised practices and preferences but also considers their global implications and interconnectedness in the realm of sustainable seafood consumption. The rest of this article explores the materials and methods, followed by the results of applying the SPF that culminate with a novel adaptation of the framework and concluding remarks with future research.

2. Materials and methods

The current research takes inspiration from Social Practice Theory (SPT) to reflect the cultural heritage of Irish lobster consumption by using a multilayered analysis approach for a nuanced understanding of the complex interplay between historical, cultural and socio-economic factors that have shaped Irish dietary habits and consumer perceptions of lobster. The theory emphasises the interconnectedness of individual actions, collective norms and material culture to aid in analysing everyday practices and their impact on broader social phenomena, such as slow food, quality consumption, environmental respect and support for small producers to connect with consumers (Siniscalchi, 2013; Vaughn, 2012).

The Social Practice Framework (SPF) by Shove *et al*. (2012) models the SPT through the interconnectedness between materials, meanings and competencies (see Figure 1 below). Practice is the act of consumption and culture, deeply rooted in local contexts, where the global distribution of ingredients is shaped by prior practices. The current research employs the SPF, where the categories: materials (e.g., lobster, bait, boat), competencies (fishing, cooking) and meanings (cultural conventions, social beliefs), are mapped to understand cultural heritage and sustainability in the Irish lobster food system. Applying the model to both historical and contemporary datasets presents issues such as differing disparate data formats and the integration of information stemming from diverse sources, such as visual methodologies (Wills *et al*., 2016) and social practices (Deschambault, 2011; Talmy, 2010). The study addressed these challenges by ensuring methodological compatibility, selecting credible sources (Goel, 2023) and emphasising reliability in qualitative research to provide deeper insights into motivated behaviours (Strauss & Corbin, 1998; Strauss, 1987).

Figure 1 - Social Practice Framework



The diagram is a visual representation that illustrates the interplay between three key elements in understanding and analysing social practices: Materiality, Competence and Meaning.
Source: Shove *et al*. (2012, p. 29).

Sampling Procedures

The sample consisted of 37 individuals that produced 52 interview narratives with Irish people associated in varying capacities to the lobster fishing industry. The small sample size, consistent with producing a reliable qualitative study (M. Saunders & K. Townsend, 2016), was purposively selected to ensure consistency, credibility, transferability, dependability and confirmability to match the aims and objectives of understanding the unique topic of Irish lobster consumption (Campbell *et al.*, 2020; Miles & Huberman, 1994). To begin, 25 individuals (known to be actively engaged with commercial lobster fishing), were identified through the Irish National and Regional Inshore Fisheries Forums and through news articles published by the Bord Iascaigh Mhara, Sea-Fisheries Protection Authority, Seascope Northern Ireland, Lobster Hatcheries and the Northern Ireland Fish Producers' Organisation. The remaining 12 individuals were selected from convenience because of their location to seaside communities and association to lobster fishing and/or consumption (Emerson, 2015) and snowball

sampling from the finite association with the lobster industry, including restaurant owners selling lobster (Goodman, 1961).

In exploratory research centred on sustaining lobster consumption, applying targeted sampling methodologies is frequently advocated, particularly given constraints in research resources. This sampling technique is critical in elucidating intricate social-ecological interrelations within lobster fisheries, as exemplified by studies on the Southern California spiny lobster fishery (Partelow & Winkler, 2016). The approach facilitates an in-depth understanding of the socio-economic dimensions influencing sustainable practices in lobster fisheries (Edwarsyah, 2017; Reztrianti *et al.*, 2023). Adopting targeted sampling strategies in cooperative fisheries research, such as in the Maine lobster fishery, has been shown to foster stakeholder trust and enhance data quality, elements essential to sustainable management and conservation efforts (Ebel *et al.*, 2018; Li *et al.*, 2015). Utilising targeted sampling in focused exploratory research is underscored by its efficacy in delivering nuanced insights into the diverse facets influencing lobster fisheries, especially in scenarios marked by limited research resources. Inclusion into the current study required individuals to be Irish, age of consent, speak English and have relevant experience in lobster cultivation and/or consumption.

Primary Data Collection

A pilot study with two Irish families aided in understanding lobster consumption motivations and obstacles, which informed the interview protocol. To ensure fisherman representation (Patton, 2002; Suter, 2011), 20 interviews were purposively conducted in 2019 with 29 participants aged 25 to 73, predominantly men, which is not surprising given the *Irish Seafood National Programme 2007-2013* identified only two women of 4,987 employees were employed in the fisheries (Bord Iascaigh Mhara, 2010).

In the second round of data collection in 2023, greater emphasis on selecting female candidates was necessary because there was a lacking female perspective from fishing families, government and non-government organisations (Britton, 2012). 17 formal interviews were conducted with 20 participants, including three women who preferred to be called 'fishermen'. 37 participant interviews represented 52 narratives, with some participants interviewed in both rounds of data collection. The sample included 32 fishermen, seven government representatives, six non-government organisation members, two restaurant owners and five fishing organisation representatives, providing a diverse and reliable dataset (Mason, 2010; M.N.K. Saunders & K. Townsend, 2016). The semi-structured interviews were conducted in the Republic of Ireland and Northern Ireland in 2019 and

2023, covering over 5,000 kilometres (primarily coastal communities). Each interview lasted approximately 60-90 minutes and was audio-recorded and transcribed verbatim to maintain data integrity.

Data Analysis

The data analysis employed a four-stage analytical framework, integrating content analysis for initial thematic identification, narrative analysis for cultural context interpretation, comparative historical analysis to discern evolving patterns and credibility enhancement through reliability and peer review. NVivo software served as an integral tool, as it facilitated the categorisation and organisation of diverse archival and newspaper data, laying the groundwork for thematic analysis (Mortelmans, 2019). During the narrative and comparative historical stages, NVivo was instrumental in managing complex narratives, enabling the efficient sorting and linking of themes across various sources and time periods (Trigueros-Cervantes *et al.*, 2018), developing a robust and systematic synthesis of findings and reinforcing the study's reliability in exploratory research (Gioia *et al.*, 2013; Saldaña, 2015).

The first stage of analysis focused on exploring lobster consumption history in Ireland by aggregating archival materials from a variety of Irish institutions, including Irish Government Archives; Bord Iascaigh Mhara; Marine Institute; Sea-Fisheries Protection Authority; National and Regional Inshore Fisheries; Down County Museum; Irish libraries and regional tourism offices (Ventresca & Mohr, 2017). Utilising NVivo software, this stage facilitates the meticulous categorisation and organisation of content, using codes, annotations, linking and querying the data to establish a foundational structure of lobster sustainability perception and understanding (Vaismoradi *et al.*, 2013). A sample of identified nodes included: historical practices (lobster fishing); cultural significance (lobster consumption) and economic impact of the lobster industry. General emergent themes in this stage included sustainability practices; economic aspects; cultural significance; community impact; fishing methods; consumer behaviour; policy and governance; stakeholder perspectives; health and nutrition.

In the second stage, the analysis evaluated individual stories and accounts extracted from the primary interview data, focusing on comprehending the underlying motivations and cultural contexts of the stakeholders involved. Narrative analysis (Clandinin & Connelly, 2000), aided in interpreting individuals' stories and understand their motivations and cultural contexts within the social practice of lobster consumption and fishing (Strauss, 1987). This stage concurrently facilitates the refinement of initial themes established in Stage 1, where experiences, such as shifts in fishing practices (travelling

further to sea to catch lobster) and community dynamics (distaste for lobster and fear of cooking the expensive food), while fishing family narratives about lobster culinary traditions highlight its cultural importance. Consumer interviews shed light on sustainable purchasing motivations and narratives from community leaders and policymakers offer insights into the impacts of regulatory policies on the industry. This iterative process of theme refinement ensures that the research captures the complex interplay between individual narratives and wider societal dynamics.

During the third stage of analysis, the research undertook a nuanced comparative and historical analysis. This analytical phase entails a rigorous juxtaposition of thematic elements across varied temporal spans and data sources, thereby elucidating longitudinal patterns and causal dynamics within the historical trajectory of lobster consumption (Layder, 1998; Mahoney & Rueschemeyer, 2003; Thelen, 2003). The comparative analysis scrutinises the influence of economic policies, progress on evolving fishing methods and understanding of fishing consumption sustainability to be compared with other countries. This process illuminates the socio-cultural metamorphosis of lobster from a basic sustenance item to a gastronomic luxury, thereby enriching the research with a comprehensive diachronic perspective that seamlessly integrates historical antecedents with contemporary realities in the Irish lobster fishing and consumption landscape. This approach is substantiated in the extant literature regarding job satisfaction among Caribbean lobster fishers (Monnereau & Pollnac, 2012); lobster utilisation (Spanier *et al.*, 2015); behavioural fishing effort allocation (Béné & Tewfik, 2001) and economics of the Swedish lobster fishery (Eggert & Ulmestrand, 1999).

The fourth and final stage is devoted to enhancing credibility through rigorous validation and dissemination processes, such as peer review and conference presentations. Triangulation in qualitative research is not necessarily to identify an absolute truth, as often sought in quantitative approaches, but to acquire a holistic comprehension of the research query by recognising the multifaceted nature of human experiences and the merit in examining them from diverse perspectives (Denzin, 2017a, 2017b). The utilisation of triangulation in this qualitative research emphasises exploring depth and complexity over mere validation or precision to ensure robustness and reliability in interpretations and enhance credibility (Clark *et al.*, 2008; Creswell & Poth, 2016; Symon & Cassell, 2012).

3. Results

This section examines the complexities of the Irish lobster fishing industry and lobster consumption patterns using the SPF model, incorporating

historical insights and current practices. It focuses on the intersection of three key aspects: material (physical elements of lobster fishing and consumption) with competence (knowledge and skills in the industry) and meaning (cultural significance of lobsters in Ireland). This comprehensive analysis aims to understand the interplay of these factors in preserving the environmental health and cultural heritage of the Irish lobster fishing sector and the greater implications within the global context.

Material

The 'Material' aspect focuses on the tangible elements critical to lobster consumption practices. This encompasses not only physical artefacts but also economic factors like lobster pricing, reflecting its value and cost in economic exchanges. Traditional Irish lobster fishing methods faced challenges because of the lobsters' habitats in deep, rocky waters, rendering their capture difficult and costly. This scarcity led to lobsters being a luxury item in Europe, in contrast to their relative abundance and affordability in the Americas. The 20th-century shift towards cheaper, processed foods reduced lobster demand in Ireland, impacting dietary habits and health (Darmon & Drewnowski, 2008; Friel *et al*., 2006). Historical fluctuations in lobster prices and industry dynamics, including overfishing and market shifts, are noted (Browne *et al*., 2001; Keenan, 2006). Contemporary market analysis shows that lobsters remain expensive compared to other proteins (see Table 3 below), affecting their accessibility and popularity in modern Irish cuisine, with historical and cultural factors further influencing this trend (Crabtree, 1986; McGarry, 2023).

Table 3 - Comparison of 1kg Meat Prices across Retail Chains in Ireland

Product	SuperValu	Dunnes	Tesco	Aldi	Lowest
Pork (Ham Fillet)	**€4.29**	€7.19	€6.15	€6.84	**€4.29**
Beef (Roast)	**€6.74**	€11.87	€12.00	€9.85	**€6.74**
Lamb (Leg)	€10.00	**€9.56**	€17.57	€11.68	**€9.56**
Chicken	€3.31	€7.98	**€3.12**	€4.99	**€3.12**
Lobster	Unavailable	€57.50	€37.50	€32.48	**€15.00***

This table compares the prices of 1kg of various meats across four major retail chains in Ireland: SuperValu, Dunnes, Tesco and Aldi.
* €15.00 is the estimated price based on purchasing directly from the fisherman as advised from a participant.

Competence

'Competence' encompasses knowledge, skills, abilities and qualifications required to perform tasks effectively, which in Ireland's well-established education system, paradoxically notes ongoing health issues such as obesity and heart disease despite widespread nutritional awareness (Darmon & Drewnowski, 2015; Donovan & McNulty, 2023; O'Sullivan & Byrne, 2020). Despite Ireland's abundant coastal resources, the limited consumption of lobster reflects a preference for familiar comfort foods, as evidenced by a fisherman's remark, *"Ya, we all know how to cook the lobsters, but I don't know why other people don't, guess just not familiar with it [know how to prepare and cook lobsters]"*. The national trend favours less healthy options like battered fish, resisting to dietary variety and a challenge in promoting diverse, sustainable seafood (Lyons *et al*., 2022). Efforts to implement dietary policies are met with historical resistance, underscoring the need for educational initiatives to encourage healthier choices (Dibb & Fitzpatrick, 2014; Tapsell, 2017). One individual reflects on their catch and cook programme,

> I think showing folks where our lobsters come from and how to cook them can really help. It's not just about teaching them; it's about making everyone feel part of what's happening down here [pier]. Sure, the tourists love this stuff, but we've got to get our own people, right here in our villages, on board too. It's good for our businesses and supports the community.

Despite the SFM's advocacy for sustainable practices, high costs hinder its implementation in lobster consumption, necessitating a focus on affordability and cultural suitability (Abood *et al*., 2003; Timlin *et al*., 2020). The political dimension within the lobster fishing sector involves navigating complex regulatory landscapes, where government bodies often receive criticism for inadequate support, as indicated by a fisherman's comment, *"Them in Dublin are feckin' useless… there's no support for the inshore fisherman"*. Another fisherman added, *"Nah, we have to do it all ourselves. It's us moving this forward [sustainable fishing practices like the V-notching programme] or there'll be nothing left"*. Successful integration of sustainable lobster practices, like the V-notching programme, into the Irish diet (mature landed sizes) requires overcoming challenges related to supply, culinary knowledge and supporting community-driven initiatives like the Kilkeel Visitor Centre and OceanWorld in Dingle. These efforts are jeopardised when organisations vital for research and sustainability, such as Seascope Lobster Hatchery, lose funding. As one person explained, *"Covid was a killer. Everyone but the farmers lost their funding. There's just no support for the fisherman, but hey, that's how it's always been"*.

Meaning

The category 'Meaning' plays a vital role in understanding the symbolic and cultural significance of behaviours within specific contexts. This aspect is relevant in Irish lobster consumption, where historical social class divisions, influenced by the English rule and associated power imbalances, have significantly shaped the dietary patterns and choices in Ireland (Wilson, 1973). For many Irish people, lobster, once seen as a symbol of English aristocracy, evoked social resentment, leading to a preference for traditional foods like whiskey, ale and bread, rather than lobster, which was associated with privilege and power (Gray, 1995; Harrison & Edelen, 1994; O'Sullivan & Downey, 2016; Thirsk, 2007; Tsai *et al*., 2022). The influence of religious practices, specifically Catholicism, also played a role in shaping food choices, with certain religious teachings potentially discouraging consuming lobster (Levey, 2008; Lorenz, 1979; Meltzer & Musolf, 2002). Contemporary perspectives indicate religious beliefs (Bible outlines in Leviticus 11, 9:12 and Deuteronomy, 14:9 that creatures without fins and scales in the seas and streams are unclean and inedible) were not a primary factor in deterring lobster consumption. One patron commented, *"Aye sure I go to church, but I couldn't be bothered with lobsters because it's too dear [expensive]"*.

Meaning & Material

The intertwining of the categories is considered 'social practice,' which provides a much richer understanding of the Irish lobster culinary narrative. Combining meaning with material (as illustrated in Table 4 below), examines the tangible elements, objects and artefacts involved in their symbolic, cultural and social significance. This approach allows for a deeper understanding of how material objects and practices carry meaning and influence behaviour, identity and culture within specific contexts. Several themes emerged capturing the essence of Irish lobster fishing and consumption. Material objects in lobster fishing, such as maps and electronic navigational tools, reflected the accumulated knowledge and lore of exploration and fearlessness in the fishing community, which is best represented by the tacit knowledge passed down to younger generations within these fishing families. One fisherman explained,

I wasn't much for school, this [fishing] was my school. I was on the boat at a very young age. My father taught me, whose father taught him and so on. It's different now [fishing] compared to back then [grandfather's era]. Bigger boats, more gear, safety, more to learn. My son and daughter come on board in the summer. They are getting the itch to fish too, but I hope the fishing get's better [laughing].

Table 4 - Intertwining of SPF Categories 'Material' and 'Meaning'

Topic	Explanation
Knowledge and Lore	The use of these navigational tools (material) is deeply connected with the lore and traditional knowledge passed down through generations (meaning), illustrating how material artefacts can carry a wealth of cultural and historical information.
Cultural Events	The material aspects of the festivals (decorations, food stalls) are expressions of the community's pride and cultural heritage (meaning), showing how material elements are integral to the celebration and preservation of cultural identity.
Harbour Infrastructure	The presence and maintenance of harbour infrastructure (material) reflect the community's dedication to and dependence on the lobster fishing industry (meaning), demonstrating how physical spaces can be emblematic of a community's way of life.
Fishing Gear	The design and use of lobster traps (material) reflect the community's expertise and traditions (meaning), illustrating how material elements are integral to the preservation and transmission of cultural practices.
Local Seafood Markets	The presence and function of seafood markets (material) are deeply intertwined with the community's social and economic life (meaning), highlighting how physical spaces can be central to community identity and cultural practices.
Culinary Ingredient	The use of lobster in cuisine (material) and its cultural and gastronomic significance (meaning) illustrate how food ingredients can be deeply embedded in a community's cultural fabric.

This table provides a concise exploration of the complex interplay between the Social Practice Framework categories 'Material' and 'Meaning'. It offers valuable insights into the relationship between tangible resources and the meanings attached to these resources, shedding light on the dynamics of social practices across different domains.

Festivals featuring lobster-themed decorations and food stalls that celebrate the cultural significance of lobster fishing were localised to the Irish coasts, particularly in larger towns or cities in 2019 and 2023. For instance, celebrations included the Dalkey Lobster Festival (Dalkey, Co. Dublin); Burren Slow Food Festival (Galway, Co. Galway); Howth Maritime and Seafood Festival (Howth, Co. Dublin), each having a component of sustainability and served as symbols of local identity and tradition. Beyond the festivals, coastal towns celebrated life on the sea, but only a few, such as Dingle, Skerries, Kilkeel (NI) or Howth (through tourism activities) drew attention to lobster consumption. When asked, a restaurant owner in Dingle

(who sold lobster in 2019) claimed that after the global Covid pandemic, tourism was non-existent and there was not enough of a local appetite to keep the regular menu item. When pursuing the topic further, they explained, *"The fisherman eats it [lobster], but again, they cook their own [catch] and not bother coming in here for it"*.

Physical infrastructure like docks and holding tanks plays a vital role in the community's connection to the sea, but few holding tanks exist outside of packing plants because of the immediate export of most lobster. In Kilkeel, one individual recognises the economic benefits of supporting local fishermen and supplying the community with fresh lobster by owning tanks, which exemplified competence in understanding market dynamics. The Visitor Centre in Kilkeel and Dingle OceanWorld also highlight their connection to the sea through displayed materials such as lobster traps used, which showed their design and construction (conservation methods such as conservation sized hatch rings) that represent both a fishing tool and a part of the fishing community's traditional knowledge and ingenuity for sustainable practices.

Seafood markets, crucial for fishermen's livelihoods and reflecting local culture, surprisingly lacked fresh lobster options for sale during the travels in 2019 and 2023. This absence extended from piers to large grocery chains and even to renowned seafood stalls in Cork and Dublin. While lobster symbolises a connection to the sea, local culinary traditions and community pride worldwide, in Ireland, historical factors like British rule and a focus on land agriculture seem to have diminished its perceived value and lifestyle significance.

(In)Competence & Material

The SPF shows a significant interplay between competence and material aspects of lobster fishing and consumption (summarised in Table 5 below). Competence in handling, processing and storing lobsters is crucial for ensuring product quality and safety, especially reliant on physical infrastructure and equipment, which are often exported because of limited local demand. The commonly held belief among the Irish population was that lobster came at a high cost. One seemingly affluent individual at a market reflected on the time of year the consume lobster, *"Every Christmas. It's a tradition that my father and my father's father and so on always did. Not sure why, but it's a tradition, I suppose. A special treat that reminds me of the holidays"*. The quote highlights consuming lobster on special occasions, akin to historical patterns observed among English aristocrats. Only a few restaurants across Ireland during the data collection period offered lobster (special menu item) but was costly, starting at €40 for a 200-gramme lobster tail supper (accompanied with potatoes and vegetables).

Table 5 - Intertwining of SPF Categories Competence and Material

Topic	Explanation
Lobster Processing Storage	The physical infrastructure and equipment form the backdrop against the competence and expertise of individuals. Competence in handling, processing and storing lobsters effectively is essential for ensuring the quality and safety of lobster products, making them marketable and appealing to consumers.
Sustainable Fishing Practices	The shared understanding of sustainability, community values, education and regulatory frameworks connect these two dimensions, reinforcing responsible lobster fishing practices within a broader social and environmental context.
Culinary Practices	The selection and handling of ingredients, cooking methods and the use of traditional tools all depend on the competence and expertise of individuals. The material elements provide the canvas on which the culinary competence is displayed, resulting in creating traditional Irish dishes that are both culturally significant and satisfying to the palate.
Consumer Preferences	Consumer preferences shape the material aspects of seafood consumption and market dynamics. Fishermen's competence in market trends and sustainable practices guides their material decisions and sales strategies. This illustrates a complex interplay between knowledge, decision-making and tangible outcomes within the context of lacking lobster consumption in Ireland.
Fishing Communities	Represents a dynamic relationship between community members' expertise and consumers influencing the tangible outcomes of lobster consumption, including the economic sustainability of fisheries. Competence is both shaped by and shapes the material aspects of fishing, contributing to the sustainability and resilience of these communities in the face of environmental, economic and social challenges, such as tourism and local demand.

This table provides an in-depth examination between the Social Practice Framework categories 'Competence' and 'Material'. It offers valuable insights into how these interwoven categories contributed to shaping human behaviour and societal functions.

The perception that lobster is expensive was tied to a gap in culinary knowledge, particularly among those living far from the coast. The intricate process of preparing and cooking lobster, coupled with the fear of mishandling such a valuable product, acts as a significant deterrent. This issue was magnified because very few non-fishing families had the traditional tools and skills required for lobster preparation and consumption.

Despite a genuine desire to savour lobster's exquisite flavour and texture, many people opted for more familiar and budget-friendly seafood options.

As one community member commented, *"If it ain't feckin' battered, no one is gonna eat it [lobsters amd seafood in general]"*. In Irish culinary heritage, they traditionally concentrated the knowledge of lobster preparation within fishing families or Irish slaves for English aristocrats, with few outsiders possessing a comprehensive understanding of lobster anatomy. Some individuals were also averse to cooking live lobsters. As one community member commented, *"It's just wrong cooking the poor wee thing live"*. Fishing families have preserved and passed down the expertise in lobster preparation through generations, enriching culinary traditions and safeguarding this aspect of Irish CFH, emphasising intergenerational knowledge and skills in preserving these culinary practices.

The tension between fishermen and government organisations in the lobster fishery has significant implications for sustainable food systems and cultural heritage because it highlights the need to align competence, which includes knowledge, skills, values and community values. When considering material aspects like fishing methods and regulations, promoting responsible fishing practices in a broader social and environmental context is essential for sustainable lobster fishing. It also emphasises how consumer preferences impact competence and material outcomes, affecting the economic sustainability of fisheries. The relationship between competence and materiality underscores the role of fishing communities in building resilience. However, challenges in enforcing sustainability initiatives and catch limits, given the vast Irish coastline, show a need for more effective regulatory mechanisms.

(In)Competence & Meaning

In Irish coastal communities, the interplay between the SPF categories meaning and competence is crucial for preserving cherished traditions, particularly lobster fishing (see Table 6 for a summary of categories). The connection between these categories underscores the need to safeguard both the cultural heritage, and the expertise required for sustainable lobster fishing. A concerning trend involves an ageing fishing fleet prioritising exporting their catch over local lobster consumption, which restricts sustainable food options and youth exposure to career prospectives.

Competence also plays a role in environmental stewardship, translating sustainability values into actions. Fishermen acknowledged that climate change and rising water temperatures are affecting lobster migration patterns, requiring larger boats with increased operational costs, exemplified in the quote,

> Aye, we all see it. The sea's warming up, so the lobsters are swimming off deeper for the colder waters. We've to sail farther now, burning more fuel, and then there's the big trawlers in our way. Between losin' our gear to the big boats and burning fuel, there's hardly any money in it now.

Table 6 - Intertwining of SPF Categories 'Meaning' and 'Competence'

Topic	Explanation
Cultural Significance	Underscores preserving both the cultural heritage and the competence required to sustain it. Nurturing and reconnecting these elements are essential to ensure that lobster retains its deep cultural meaning and significance within Irish food culture.
Environmental Stewardship	Proficiency ensures that the essence of environmental stewardship is converted into measures that protect the cultural importance of lobster while ensuring conserving the natural environment for forthcoming generations. This interwoven connection emphasises signifying sustainability in upholding the authenticity of Irish food heritage.
Fishing Culture	Showcases how cultural significance is preserved and enriched through the knowledge, skills and practices of fishermen. Competence ensures that lobster fishing remains a vibrant and sustainable part of Irish cultural heritage, strengthening the connection between the cultural meaning of lobster fishing and the tangible actions taken to uphold it.
Tourism Cultural Exchange	Competence ensures that lobster, as an Irish cultural symbol, is presented authentically to tourists while aligning with the cultural and ecological values of sustainable food systems. This synergy enriches the experience and supports the cultural worth of lobster within the broader context of Irish food heritage.
Community Identity	Lobster fishing competence endures more than just an economic endeavour; it also serves as a cultural tradition that encapsulates the principles, past and essence of these coastal communities. The expertise transmitted across generations, solidifying its place within their cultural legacy. strengthened and enhanced the significance of their bond with lobster fishing.

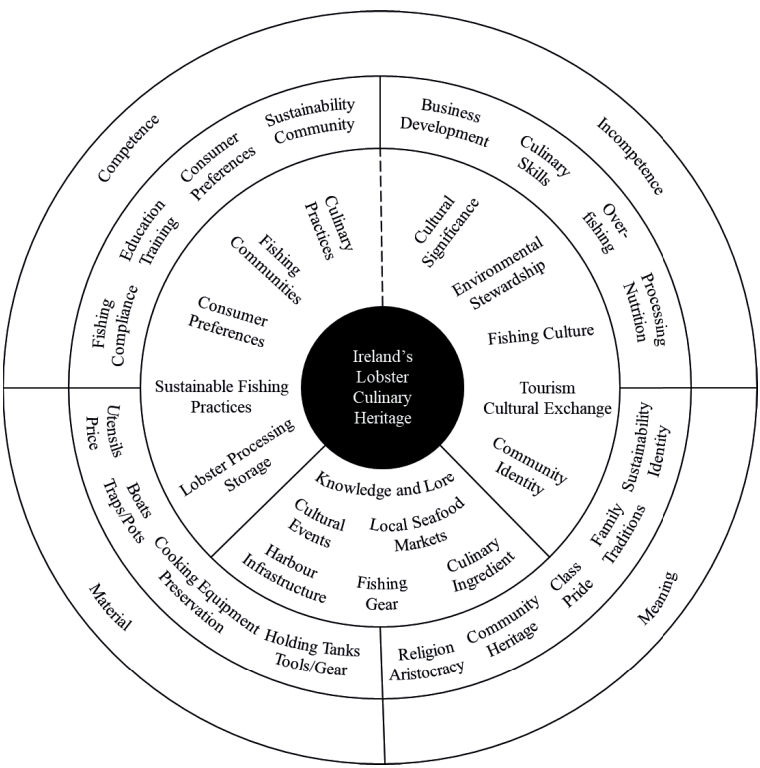
This table presents an analysis of the intricate relationship between the Social Practice Framework categories 'Meaning' and 'Competence' within various contexts. The table offers insights into how these categories jointly contribute to the dynamics of social practices in Irish lobster culture.

The quote highlights the associative costs, financially, environmentally and safety impacting Irish lobster fisherman that consequently increase the lobster prices and limit food access. Comprehending the significance of sustainability in safeguarding Irish food heritage and its extensive implications for local food affordability is vital for informed contemplation.

In tourism and cultural exchange, competence is central to presenting lobster as an Irish cultural symbol, especially in areas like Galway, Dingle, Cork, Howth and Kilkeel. Sustainable fishing initiatives reinforce lobster's cultural worth within Irish food heritage. However, challenges like poaching threaten

both livelihoods and community identity, emphasising the deep connection between lobster fishing and the cultural legacy of Irish coastal communities. Fishing is not merely a vocation, it is a way of life, a passion deeply ingrained in their being. A fisherman reflected on this notion, *"I don't know what it is, it's just me. It's who I am, and I don't know no different. Without the sea, I'm nothing"*. This poignant quote encapsulates the profound connection that Irish lobster fishermen have with their craft and the sea, reflecting a way of life and a love for their heritage that they are determined to pass on to future generations. By applying the SPF, the results within shed light on the intricate relationship between meaning, competence and material aspects in Irish lobster fishing and consumption. Figure 2 below reflects the novel adaptation of the framework to underscore the urgent need to preserve both the cultural heritage associated with lobster fishing and the expertise needed to sustain it.

Figure 2 - A Social Practice Framework: Ireland's Lobster Culinary Heritage



This figure provides a visual representation of the interconnection between fishing and consumption in Irish communities. The quadrants are sectioned by category, with the third level divided in thirds: top-left (in/competence and material); top-right (in/competence and meaning); bottom (material and meaning).

Implications on the Global Literature

Global literature on lobster consumption and sustainability is diverse, where studies have examined historical usage (Spanier *et al.*, 2015); consumer trends (Wang *et al.*, 2021); economic aspects (Jeffs *et al.*, 2020) and environmental impacts (Boavida-Portugal *et al.*, 2018). These reveal the dynamic nature of lobster fisheries worldwide, focusing on consumer preferences, economic viability and ecological sustainability amid global and local challenges. In contrast, this research, using the SPF, provides a distinct perspective on Ireland's lobster industry, reflecting on cultural, historical and material aspects of consumption. While regions like Australia, North America and China view lobster as a luxury (Phillips & Melville-Smith, 2005; Wang *et al.*, 2021), the Irish context shows avoidance because of high costs and cultural factors, offering a unique viewpoint compared to the general global narrative. This study emphasises the cultural and historical dimensions in Ireland, differing from global discussions that often prioritise economic and environmental sustainability.

Exploring competence, especially in culinary knowledge, aligns with global concerns on sustainability practices, such as in Vietnam demonstrating innovative approaches to meeting global demand while potentially alleviating pressure on wild populations (Jeffs *et al.*, 2020). Irish narratives of lobster consumption, influenced by historical and cultural factors like British rule and culinary conservatism, contrast with global perspectives that typically focus on economic and environmental sustainability. This differs from studies like Madigan *et al.* (2018) and Baki *et al.* (2018), which concentrate on environmental health risks as contaminants in lobsters. Research by Wahle *et al.* (2020) on the economic and management aspects of global lobster fisheries complements the Irish case by highlighting the worldwide economic significance and management complexities of lobster fishing, including market dynamics and the industry's viability. This provides a contrasting yet comprehensive view of the challenges and approaches to managing lobster fisheries globally.

The current investigation into integrating the SFM within Ireland's lobster industry, though replete with profound insights, grapples with several limitations and areas of uncertainty. Its small sample size, suitable for detailed qualitative analysis, may not fully represent broader trends. The reliance on qualitative methods could introduce interpretative bias and its historical focus, while rich in context, might not capture the evolving dynamics of the lobster industry, such as changing consumer behaviours and environmental factors. Emphasis on the cultural aspects of lobster consumption risks overlooking economic, regulatory and environmental sustainability challenges. The theoretical framework employed may

oversimplify the complex interactions within the lobster sector, where applying the findings is subject to unpredictable changes in consumer patterns, market shifts and environmental conditions, influencing the practical implementation of SFM principles in Ireland's lobster industry.

Conclusions

This research on Irish lobster fishing deftly intertwines cultural heritage, sustainability and history, highlighting lobsters as symbols of deep-sea connections and enduring coastal traditions. The study, guided by the Social Practice Framework, unveils the complex synergy between expertise, material factors and cultural values, signifying social practices in lobster fishing communities for preserving cultural food heritage and transferring essential traditional knowledge and skills. Competence in sustainable lobster harvesting and its cultural value are central to reinforcing community identity, with material components like equipment and regulations being critical for ecological and economic sustainability.

The results offer several pragmatic applications for stakeholders in the lobster fishing industry, policymakers and the sustainable fisheries management community. For industry stakeholders, the study's insights into traditional fishing practices and the cultural significance of lobster can inform marketing strategies and product development, potentially enhancing the appeal of lobster products in both local and broader markets. Marketing campaigns could highlight the heritage and traditional methods of lobster fishing in Ireland, creating a premium brand image. This approach could attract consumers who value authenticity and sustainability, opening new market opportunities domestically and internationally. The research can guide developing value-added lobster products that reflect traditional Irish culinary heritage, potentially creating a niche market.

Policymakers can formulate regulations that integrate sustainably developing the lobster industry with preserving its cultural heritage, drawing insights from recent research. These regulations could entail the adoption of sustainable fishing methods congruent with traditional practices, consequently protecting lobster populations and the historical essence of fishing communities. The establishment of additional marine protected areas for lobster regeneration, coupled with the revision of fishing quotas and seasonal limits based on scientific evidence, is advised. Implementing traceability and labelling systems could enhance consumer awareness and appreciation of the distinct cultural and culinary significance of Irish lobsters. These strategies should involve the active participation of local fishing communities in policymaking, as well as investment in research, especially in

areas concerning sustainable lobster aquaculture and the impacts of climate change. Educational initiatives aimed at both fishermen and consumers are vital in encouraging sustainable practices and culinary innovation, potentially increasing the demand for sustainably sourced lobster. Rigorous regulatory enforcement is essential to uphold these sustainability standards. Offering subsidies or incentives to fishermen who adhere to traditional, sustainable fishing methods could be considered to balance ecological conservation with the support of local economies.

The focus on maintaining traditional practices within contemporary sustainability tenets is congruent with the ethos of the SFM community. This approach advocates for initiatives incorporating community-based projects that recognise and appreciate the indigenous knowledge and practices of local communities. SFM can engender a more comprehensive strategy in fisheries management, characterised by community-driven conservation endeavours and local monitoring schemes. Such efforts are aimed at bolstering ecological sustainability, simultaneously augmenting community participation and proprietorship in conservation initiatives.

Future research on the SFM's impact in Ireland can employ the PLACE framework (Brenton & Slawinski, 2023; Slawinski *et al.*, 2023; Slawinski *et al.*, 2021), focusing on principles like community leadership, diverse perspectives, local capacities, engaging storytelling and holistic thinking. This approach aims to identify opportunities to promote sustainable and equitable food systems by considering policy, availability, affordability, convenience and ethics. Community leaders, bridging divides, leveraging local strengths and sharing interesting narratives can foster a deeper understanding of Irish dietary shifts and the potential impact of the SFM.

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Alternative Food Networks in Afghanistan: The Role of Collaborative Agribusiness in Food Security

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Abstract

Afghanistan has been an understudied country despite its current difficulties stemming from political conflict for decades and its adverse impact on the country and society, such as food security. This article presents firsthand findings on the potential of collaborative agribusiness initiatives as part of Afghanistan's food system to address food security challenges. These embody an emerging body of literature known as alternative food networks, as part of the Slow Food movement that prioritizes community wellbeing, as a solution to food security. Findings are drawn from selected interviewees who are key Afghan stakeholders, ranging from farmers to experts in the agribusiness sector, relating to collaborative agribusiness initiatives which play a crucial role in fostering food security in Afghanistan. Specifically, it argues that through collaborative initiatives among farmers and the integration of marginalized groups, agricultural productivity increases, which ultimately leads to better food security. Three components emerge – resilience, resource enhancement and revelation (3Rs) – as the conceptual contribution. This approach of alternative food network improves access to markets and resources, particularly for smallholder farmers in remote regions and provinces.

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Introduction

This article explores the importance of alternative food networks (AFNs, from hereon) as part of the Slow Food movement solution for global food security. In particular, it examines the role of collaborative agribusiness for the under-researched country context of Afghanistan. The term AFN has emerged from the 1990s as a counter-response to the unethical nature of industrial food systems, such as standardization and mass production (see Edwards, 2016). Its approach is varied, including a range of community supported agriculture to specialist methods of production involving a broad range of stakeholders, and is built around ethical principles of environmental sustainability and, more recently, 'food justice'. The approach is 'slow' because of the anti-mass production techniques involved, involving greater community embeddedness.

What makes food or food systems 'alternative' has been the subject of debate for some time. Specifically, Watts, Ilbery and Maye (2017) introduced the distinction between product-based alterity and distribution-channel-based alterity as possible routes. These were explored by Rosol (2020) as alternative economic practices and presented it as the third pillar of the alternative food systems. Yet, little is currently known about how they work for non-affluent countries, such as a war-torn country like Afghanistan. While there is evidence of a global emergence of AFNs like consumer cooperatives in Poland (Bilewicz and Spiewak, 2015) and farmer initiatives in China (Si *et al*., 2015), the importance of nuanced and country-specific approaches is crucial (Abrahams, 2007). For this reason, we fill the gap in the empirical literature by presenting the complex context of a conflict affected country that has otherwise been overlooked. Theoretically, we elucidate this third pillar, in particular, collaborative agribusiness, in the food system of Afghanistan. Thus, this research aims to explore the potential of collaborative agribusiness initiatives as part of Afghanistan food system to combat food security challenges. The objective of this research is therefore to find out whether collaborative agribusiness initiatives can help improve food production, support communities, and help vulnerable groups such as marginalized small-holder farmers. Collaborative agribusiness initiatives represent a novel approach that employs the power of partnerships between different stakeholders, including farmers, community members, businesses, government entities, non-profit organizations, and private businesses, and are therefore deserving of extensive research.

1. Agribusiness in Afghanistan

Afghanistan has been suffering from political conflict for decades, resulting in growth and stability difficulties. According to Islam *et al.* (2022), the country's infrastructure, irrigation system and agricultural practices have all been negatively impacted by the ongoing conflict, and the fall of Afghanistan's government by the Taliban in August 2021 has deteriorated this situation furthermore. Of utmost concern is food insecurity, calling for more innovative ways to address it. Conventional approaches to addressing food (in)security – such as conventional farming and irrigation – in Afghanistan have proven insufficient given the complex and volatile nature of the country's situation. Innovative solutions are necessary to tackle the root causes of food insecurity and build long-term resilience.

Afghanistan is a mountainous country situated at the juncture of Central and Southern Asia. Its total area is approximately 650,000 km^2 and the estimated population is 37 million (Samim *et al.*, 2020). Afghanistan's unique geopolitical and prolonged history of conflict set it apart as a distinctive context for understanding the challenges in less developed and conflict-affected countries. As more than half the population works in the agricultural sector, the lives of Afghans are highly dependent on agricultural products. Food security – defined as having access to sufficient nourishing food on both physical and financial levels (World Food Summit, 1996) – is very much the subject of today's ongoing debate among the grand challenges, such as those relating to the UN sustainable development goals (SDGs) as a guide and measure of progress towards a more socially, economically, and environmentally sustainable future. In the agri-food system, this calls for further discussion of alternative food networks and alternative economic practices within the alternative food system (Rosol, 2020).

Afghanistan has a long history of farming traditions (Khan *et al.*, 2021) that are part of its cultural identity. The Slow Food movement emphasizes the promotion of local, traditional, and sustainable food production methods (Voinea, 2019; Doppler, 2020), which aligns with Afghanistan's rich farming traditions and cultural identity. However, ongoing conflict has put these traditions at risk. It is important to preserve and revive these traditional farming methods to connect people with their cultural heritage and to help build a more sustainable food system. Ensuring food sufficiency in the country for the long-term means thinking about farming in ways that do not harm the environment and ensuring equality among marginalized groups. The World Bank (2019) projected that the country's food security was to exacerbate. Alternative economic practices such as collaborative agribusiness initiatives can help preserve farming traditions which can in turn improve food security in Afghanistan. Integrating Slow Food principles, such as

traditional food support (Munjal *et al.*, 2016), into the food system can strengthen the food networks. Collaborative agribusiness partnerships can provide small-scale farmers with access to resources and markets.

2. Need for Alternative Food Networks

The Slow Food movement, with its core principles of promoting good, clean, and fair food, has gained significant attention in the area environmental sustainability. This movement emphasizes the importance of sustainable agriculture, biodiversity, and traditional food practices, aligning closely with the values of alternative food networks that prioritize local, organic, and ethically produced food. By advocating for the preservation of food traditions, supporting small-scale producers, and improving community connections through food, slow food embodies a holistic approach to food consumption that goes beyond just food (Sobreira, 2022). The movement aims not only to ensure the environmental sustainability of food production but also preserve cultural heritage and promote social equity (Uzel, 2020). Heritage, whether cultural or culinary, plays a significant role in shaping food traditions and practices within communities. The movement, with its emphasis on "good, clean, and fair" food, seeks to protect and celebrate culinary heritage by promoting local and traditional food products. By advocating for the preservation of traditional farming methods and indigenous ingredients, Slow Food contributes to the conservation of culinary heritage and supports small-scale producers who are often the guardians of these traditions (Nassen, 2017).

Alternative food networks (AFNs), meanwhile, offer a decentralized and community-based approach to food production and distribution. These networks often prioritize local sourcing, organic farming practices, and direct relationships between producers and consumers. By incorporating elements of heritage preservation and sustainability, AFNs align with the values of the Slow Food movement. They provide a platform for small-scale farmers and artisanal producers to showcase their heritage crops and traditional food products, creating a market for culturally significant foods that may otherwise be marginalized in mainstream food systems. However, the literature on AFNs is somewhat disjointed and varied. AFNs can be country specific, which varies between the choices available between European approaches that focus on a decentralized approach to avoid safety concerns and disease outbreak (Goodman *et al.*, 2011) from American ones that are characterized by a civic-led approach that recognizes the 'back-to-land' principle relating closely to organic approaches (Guthman, 2004). Neither of these recognize or build in specifically the constraints faced by those faced by Afghanistan.

Nonetheless, the quality turn has at least recognized such uniform terms as 'short food supply chains', or 'product in place' and 'process in place' to symbolize the importance of improving environmental friendliness (Renting *et al.*, 2003). This is similar to the scale benefits of 'embeddedness' – both vertical and horizontal – as part of the supply chain (Sonnino and Marsden, 2006).

Barbara and Dagnes (2016) characterized AFNs as being self-organized from the bottom-up (involving farmers, rather than policy makers), involving local individuals and a meagre involvement in institutions. The outcome of which is accessibility, sustainability and quality. Accessibility refers to AFNs being located in areas where locals can become part of the process (Grasseni, 2013); sustainability refers to achieving zero-miles (Schlich and Fleissner 2005) – notwithstanding the 'local trap' of multiple territorial production which counters ecological scale (Born and Purcell, 2006); and quality refers to both hard standards about the supply chain and soft standards on the traditions and trust relationships (Murdock, 2000).

With these in mind, more recently Lin (2020) emphasized how grassroots initiatives such as the Slow Food Movement and Low-Carbon Food Movement play a crucial role in promoting local food systems and sustainable culinary practices. These movements not only advocate for the consumption of local food but also challenge conventional industrial food systems, emphasizing the importance of community engagement and responsible consumption. The Slow Food movement can be seen as a specific type of AFN that focuses on celebrating local food traditions, supporting small-scale producers, and promoting food that is good, clean and fair. By engaging in activities such as farmers' markets, community-supported agriculture (CSA), and direct sales, Slow Food initiatives contribute to the development of more resilient and equitable food systems. Overall, the relationship between the Slow Food movement and AFNs is characterized by a shared commitment to transforming the food system towards greater sustainability, social responsibility, and cultural appreciation. Both movements play a vital role in raising awareness about the importance of conscious food choices, supporting small-scale producers, and fostering connections between producers and consumers (Michel-Villarreal *et al.*, 2019).

As people face difficulty balancing the profit they gain and their ability to care for the people, alternative economic practices are gaining growing attention among economic geographers (Gibson-Graham *et al.*, 2019). Michel-Villarreal (2019) identified the lack of frameworks based on measurements and indicators for assessing the three dimensions of sustainability in AFNs. A common language of sustainability in AFN research called for standardized assessment frameworks, even though most people believed that AFNs were more sustainable than traditional food systems. The current

frameworks can be modified for supply chains and agricultural systems to fit the context of AFNs (Michel-Villarreal, 2019). Le Heron (2009) identifies AFNs as one of the most important economic geographical research areas within agri-food studies. Yet, to better understand these networks, we must first understand alterity. This could be alterity based on the product, which is food based on its distribution channel or based on economic practices as introduced by Rosol (2019) as a third pillar in alternative food systems.

Based on debates in economic geography, Watts *et al.* (2005) outlined the difference between alternative food and alternative networks. Watts *et al.* (2017) went further with the concept of weaker and stronger alternative food systems through this distinction. Weaker alternative food systems relate to product and the quality of the product, while stronger alternative food systems shift the emphasis from food to food-distribution-channels. The review is geographically delimited to Western Europe and North America and focuses more on the material aspect of food production rather than the activities that underpin this variation. However, by understanding the alterity in alternative food networks along with economic practices, researchers and policymakers can gain a deeper understanding of sustainable alternative economic practices as part of the alternative food system, geographical variations, and different dimensions of alternative food systems. Distinguishing between alterity based on the product which is food and alterity based on distribution channel is not sufficient anymore. To elucidate this, there needs to be a shift of focus from AFNs to alternative economic practices as proposed by Rosol (2020). These alternative practices within AFNs transcend mere product or distribution attributes, offering a unique perspective on economic relations, spatial dynamics, and socio-environmental considerations within the food sector which will be the focus of this study.

However, in the context of Afghanistan and its unique challenges related to food security, there is a knowledge gap in understanding how collaborative agribusiness initiatives as part of an alternative food system can integrate with the principles of the Slow Food movement to strengthen alternative food networks and enhance food security outcomes which are using collaborative initiatives to ensure food security. There is also a need to assess how these principles can be adapted and scaled in a country like Afghanistan, where access to resources and infrastructure is limited. By bridging the gap between producers and consumers, these networks facilitate the exchange of knowledge, resources, and values that are essential for building resilient and equitable food systems. There is a critical need to investigate the potential of collaborative agribusiness initiatives in supporting local farmers, improving access to nutritious food, and fostering innovation in agricultural practices in regions affected by food insecurity.

3. Methodology

Research Design

AFNs in Afghanistan were researched using an inductive approach that required a strong closeness with the research subjects at hand – which were the key stakeholders within the local community involved in the AFN. This context was then treated as a 'case' for methodological purposes (Yin, 2003) and all issues of AFN were focused around the Afghanistan context only. Thus, a check-list involving all the key issues about the characteristics, operational practices and concerns of AFNs described in the previous section of this article was initially compiled. This then was expanded into a more comprehensive interview guide which was later used with interviewees.

The choice of interviewees spanned farmers, non-governmental organizations, agricultural entrepreneurs, experts, and community members. This choice was believed to be both highly representative and comprehensive because farmers offer first-hand knowledge of the agricultural industry representing the bottom of the pyramid for a country, NGOs present viewpoints on intervention tactics, agricultural entrepreneurs present creative ideas, experts offer theoretical and practical expertise, and community members represent the interests of the final beneficiaries. These took place in the summer of 2023 in north-west Afghanistan, which is a highly representative area affected by conflict and community farming. The direct contact by one of the authors who was familiar with the area promoted open-ended discussions and allowed participants to trust and therefore share more freely their personal experiences; this enabled more accurate and in-depth observations.

Data Collection

Semi-structured interviews with 28 participants were the main data collection technique used in this study (see Ng and Coakes, 2013). The number was considered sufficient when the broad range of stakeholders within the research design was reached and when it was felt information saturation was reached – the point at which the research team believed no new information would be gained by any additional interview. Each interview lasted about 25 minutes, and was carried out using telephone and simple conferencing software (eg. Skype). Indeed, this meant there was the likelihood of a selection bias of that included only those who were more technologically enabled. However, as the country was still politically unstable, this represented the safest and most direct way to access the

key participants. The closeness was at least facilitated by the use of the local language Dari as the medium of communication for the interviews. Hence, there involved translation of the technical concepts from western literature about AFN into Dari, recording the conversation in Dari, and direct translation of this into English before the data analysis. This was carried out by one of the article's authors, who was fluent in the language (Rolland *et al.*, 2019).

While the research design did indeed ensure a prior list of key stakeholders representing different importance, the exact engagement involved a non-probability snowball sample (Parker *et al.*, 2019). It began with some initial contacts known to the researcher (referred to 'seeds' within the technique), who were recruited to participate in the research because they meet the 'case' requirements as per Yin (2003). The willing participants were then requested to suggest further contacts who meet the research criteria and were willing to participate, who in turn suggested additional possible participants because we were limited by the number of participants initially. The exact interviewees are listed in Table 1.

Table 1 - Interviewee Profiles

Interviewee #	Role	Industry/sector	Years of service	Sex
01	Local Community Member	–	25	M
02	Farmer	Agriculture	15	M
03	Expert	Agriculture	3	M
04	Communication Officer	NGO	13	M
05	Farmer	Agriculture	18	M
06	Agricultural Entrepreneur	Food processing	8	M
07	Agricultural Entrepreneur	Agriculture	5	M
08	Agricultural Entrepreneur	Agriculture	5	M
09	Local Community Member	–	25	M
10	Local Community Member	–	18	M
11	Agricultural Entrepreneur	Agriculture	9	M
12	Expert	Agriculture	10	M
13	Farmer	Agriculture	15	M
14	Farmer	Agriculture	20	M
15	Local Community Member	–	18	M

16	Agricultural Entrepreneur	Agriculture	7	M
17	Agricultural Entrepreneur	Agriculture	7	F
18	Farmer	Agriculture	20	F
19	Expert	Education	8	–
20	Local Community Member	–	23	F
21	Agricultural Entrepreneur	–	6	–
22	Project Manager	NGO	22	F
23	Government Official	Government	4	M
24	Local Community Member	–	–	F
25	Project Manager	NGO	21	F
26	Farmer	Agriculture	13	M
27	Expert	Agribusiness	8	M
28	Program Manager	NGO	15	M

Data Analysis

The interview transcripts were verbatim to ensure accurate analysis of the data. This also ensured that the standard thematic data analysis technique could be applied, which was considered most suitable because it ensured issues of the literature could be accurately followed up in the empirical research, and extended to the context of Afghanistan. Each step in the data analysis process helped to clarify the overall meaning of the research findings (Vears, 2022). Specifically, these were:

- Step One: Reading and rereading the transcriptions.
- Step Two: Categorization and grouping the coded segments into groups or categories. This process made it easier to organize and synthesize the material, allowing for a thorough analysis of the themes and subjects that came up throughout the interviews.
- Step Three: Creation of a coding tree, using standard sub-codes for issues, such as A1.1.2 to concern issues within AFN (eg. quality-community-labour).
- Step Four: Code the interview transcripts.
- Step Five: Capture frequencies of the codes.
- Step Six: Identify patterns in the frequencies.
- Step Seven: Conceptualize, and write up these empirical findings.

This technique was carried out manually by the research team in the absence of any computer-assisted software, for the reason of the

manageability of the sample size and for the advantage of being closely attached to the data for greater familiarization. At each stage of the research, accurate notes were kept in a separate note-book to refer back to as a way to minimize bias as a form of reliability and validity check.

4. Findings

The empirical investigation unfolded the following key findings about AFNs in Afghanistan.

Finding 1: Naturally limited resources

The most important impact that AFNs have is the support of small enterprises and boosting food security through creating a strong and efficient relationship between producers and consumers. On the other hand, AFNs can be adversely influenced by the lack of resources. The development of AFNs can be hindered and the support to local producers can disappear. Hence, one of the main challenges that farmers and agricultural business people encounter in Afghanistan is the lack of sufficient resources and the unequal distribution of these resources. While farmers expect the government to provide them with better services and resources, they struggle to enhance their profits with existing resources. Consequently, many farmers decide to migrate to cities and desert farming if they get a chance. The absence or inaccessibility of resources and poor infrastructure result in the insufficient contribution of agribusiness to food security.

The lack of water resources has a large adverse impact on agribusiness. Being a landlocked country, Afghanistan's maximum water supply is groundwater that is lifted to the ground through deep wells. While there are many watery crops cultivated in Afghanistan, it is of great importance to access sufficient water supplies. For example, rice is a commonplace crop in Afghanistan which requires a large amount of water supply to be cultivated, particularly with the traditional method of cultivation that is utilized in Afghanistan. However, groundwater supplies have severely decreased in recent years, and it has led to water scarcity and expensiveness. An entrepreneur commented that:

> In Gozareh district, where I have established an agricultural enterprise with my family, there is very little water resources. Landlords who have dug deep wells sell water expensively. Last year, we decided to cultivate rice because its price was increasing. But unfortunately, we had to pay a lot of money on water which caused the loss of our business (Interviewee #11).

The absence of strict rules on well digging adds to this problem and causes underground water levels to diminish even further.

In addition, the inaccessibility of electricity in rural areas makes it challenging for business people to use an eco-friendly and cheaper source. For example, another agricultural businessman shared, "I use machinery that can be operated by both electricity and gas. I know that electricity is eco-friendly, but we don't have access to electricity all the time, so I have to use the ones operated by gas" (Interviewee #17). Business people have to raise their productivity and maintain their success, and in order to do so, they are forced to use gas-operated or other less eco-friendly facilities due to inaccessibility to modern technology and infrastructural limitations. The usage of fossil fuels and inaccessibility of electricity not only result in cost deficiency but also degrade the environment.

Furthermore, the lack of awareness of new sustainable methods causes the waste of large amounts of valuable resources. This lack of awareness is more prevalent among farmers' communities. For example, a farmer added:

> It has been a few years that we have not had good water resources. However, there are many modern agricultural methods that can avoid the waste of resources, like dropping irrigation but the farmers here are not acquainted with such methods. If we knew the new and useful ways of practicing agriculture, we would be able to use our limited resources more carefully and refrain from their waste (Interviewee #18).

As a result, the amount of resources will keep decreasing and the success of agribusiness is highly endangered.

Moreover, the nonexistence of an effective transportation system and geographical constraints irritate agricultural enterprises and add to their previously mentioned issues. Farmers who practice agriculture in remote areas find it very difficult to transfer their products to city markets effectively. As a farmer commented:

> Although we have a lot of potential for practicing agriculture in the country, do you know why we are not happy with what we are doing? It's because we are very far from the cities and there's no easy and convenient way to transfer our products to cities, so we have to sell our products at a lower price in the village on the spot. No one listens to our pain (Interviewee #5).

Until the transportation system is not amended and reaching markets is not eased, it will exert further strain, specifically for those enterprises that have been established further from the city centers, to sell their products and crops directly to the main markets in the city.

In summary, the limitation of resources causes many constraints and adversely affects the success of agribusinesses. In the agricultural sector,

what obstructs the development of ventures are the lack of awareness of sustainable agriculture, resource limitations and inaccessibility, and infrastructural constraints. It is evident from this concern that there is no short distribution channel known as AFN in Afghanistan, and it is not the distribution chain that defines alterity in the Afghan food system. However, alterity can be defined by the economic activities that keep the food system running.

Finding 2: Collaborative agribusiness that goes beyond the plough

The agribusiness sector in Afghanistan is replete with difficulties and challenges. The limitation of different types of resources which were elaborated in the first finding makes it very unexpected for agribusinesses to maintain success. In other words, it is almost impossible to expect many agricultural enterprises in Afghanistan to prosper due to the restrictions and limitations that stand in the way of agribusiness. As one expert noted:

> It is quite amazing to see how long-lasting some small agricultural enterprises become while encountering so many challenges. To put it straight, on paper, most of these small agribusinesses in Afghanistan should fail but they usually last longer than expected (Interviewee #8).

Nonetheless, despite all the hardships and arduousness threatening agribusinesses in Afghanistan, they can still survive and continue to exist. The number of people living under the poverty line is also less than expected. The most fundamental factors behind these bewildering facts are the religion and culture in Afghanistan.

Firstly, Afghanistan is a deeply religious society. Most Afghans are strictly religious and believe that all worldly activities are of no use if they contradict their spiritual beliefs. Relevantly, they are very cooperative with each other, and it is rooted in their religious matters. Referring to the prophet Muhammad, "A Muslim is the brother of a fellow-Muslim. He should neither commit oppression upon him nor ruin him, and he who meets the needs of a brother, Allah will meet his big needs" (Sahih Muslim, 2580). Therefore, Afghans see this as a holy duty to be helping hands to their relatives and neighbors. This explains why many farmers help each other when they are in desperate need of resources. Thus, one villager explained:

> Our religion commands us to be kind and helpful to each other. Whenever one of our villagers is in trouble, everybody is going to help as far as they can. People here are very religious. They pray every single day and I believe one of the main

reasons that can describe the fact behind the friendliness and closeness of these people is that they all follow the same religion and accept each other without trouble (Interviewee #20).

In addition, Afghans are culturally sympathetic and affectionate people. In Afghanistan, it is quite conventional and customary to participate in ceremonies held by relatives, friends, and even neighbors. In most ceremonies, either celebratory or saddening ones, hundreds of people attend and try to show their sense of sociability and care. This strong bond of care and attention influences the workplace as well. Farmers, in particular, have a strong sense of sociability and take this as their responsibility to help their neighboring farmers if they can. There is even a custom among farmers called 'Hashar' which eases the drudgery at the time of harvesting. Hashar happens when farmers want to harvest their crops. Several farmers assemble and work together on the field of one farmer among them. After it is completed, they continue harvesting other farmers' fields so that everyone will have their crops harvested with each other's help and without paying any extra money for labor. Stating this point firmly, a community member noted:

My father always grows wheat and so does two of our neighbors. Their fields are set adjacent to each other and when it is time to harvest, we always Hashar. This way, we avoid paying extra money for labor and at the same time, get our own crops effortlessly (Interviewee #23).

Customs like Hashar help many small businesses survive by considerably reducing expenses.

Furthermore, agribusiness in Afghanistan is held and organized by people in the countryside and rural residents generally tend to be more supportive of each other than that of city people. Life in villages is particularly different in terms of sociability. A small number of people rarely exceed one thousand, live in each village and because of this, and most villagers from one area usually know each other well. Villagers' unique social customs, unfamiliarity with technology and separation from cities are reasons that construe why country people still maintain their old customs. One good old custom still prevalent among them is supporting each other's backs as well as possible. Farmers in villages lend each other property, finance, and other resources. A farmer explains:

If one year, one farmer faces loss, the others can help him by lending him some money or other resources. I was taught this by my father when I was a little child, and he was taught this by his father when he was a kid. That is how we live in the countryside (Interviewee #13).

This explains another significant factor behind small agricultural enterprises' survival.

To sum up, Afghanistan's agricultural enterprises are not normally expected to be continuous due to the restrictions and constraints that lie in their way, notably resource limitations and lack of sufficient government support. Meanwhile, more people were expected to live under the poverty line by taking this disadvantageous condition into account. Nonetheless, despite all the miseries and difficulties, people are still believed to be doing fairly well. This research found this unforeseen result is caused by collaborative initiatives in Afghan agri-business which are known as alternative economic practices underpinning the whole food system in the country. These alternative economic practices are mainly affected by two main pillars of religion and culture in the country.

Finding 3: The Absence of Formal AFNs in Afghanistan

Developed nations boast a diverse array of AFNs, including short distribution channels, farmers' markets, community-supported agriculture, specialist food retailers, and fair-trade initiatives. In contrast, Afghanistan appears to lack these formal structures, raising questions about the resilience and sustainability of its food system. An expert commented:

> A great concern in Afghanistan that hinders the development of the agriculture sector and farmers' further profit is the absence of formal channels that can link farmers to markets. Farmers here sell their yield with the lowest cost to dealers, and they can never risk stockpiling their crops due to lack of ice houses and other facilities (Interviewee #4)

In Western countries, short distribution channels thrive as a means to connect consumers directly with producers, fostering transparency and reducing the distance between farm and table. Farmers' markets provide vibrant spaces for local producers to showcase and sell their goods directly to consumers, promoting a sense of community and supporting small-scale agriculture. The absence of these channels in Afghanistan suggests a potential gap in direct consumer-producer interactions and the local food movement, which has proven beneficial in other contexts.

Moreover, the absenteeism of community-supported agriculture (CSA) in Afghanistan is noteworthy. CSAs establish a direct relationship between consumers and farmers, often involving upfront financial support from consumers in exchange for a share of the harvest. This model promotes sustainability, community engagement, and shared risks and rewards. The

lack of CSA initiatives in Afghanistan underscores a missed opportunity for building closer ties between farmers and consumers and fostering a more sustainable and supportive local food system. A farmer described:

> When it is time to harvest, I sell one kilogram of apricots in exchange for ten Afghanis. However, the dealer who buys my yield sells one kilogram of grapes in exchange for twenty Afghanis. If I had transportation facilities and knew the market, I could sell them myself and would make a much greater profit. I expect the government to buy our products at a stable cost from villages so that we do not end up making losses each year (Interviewee #22).

Specialist food retailers and Fairtrade initiatives, prevalent in developed countries, play a pivotal role in offering consumers access to ethically sourced and unique products. These channels support both local and international producers, emphasizing fair compensation and sustainable practices. The absence of such specialized outlets in Afghanistan raises concerns about the limited availability of diverse and ethically sourced food options for consumers, potentially limiting choices and impacting the livelihoods of producers. Collaborative agribusiness is a resilient force in the absence of formal alternatives. The deep-rooted religious and cultural values, along with the close-knit nature of rural communities, foster a spirit of collaboration among farmers, enabling them to navigate challenges collectively. As noted:

> Despite all the problems that villagers face, they still love the affectionate bonds they make with each other and the assistance they provide each other with when in need. When we ask about the problems regarding the lack of food networks, farmers usually say that they rely on Allah and that He will hopefully solve their problems. These are reasons that make them keep up (Interviewee #25)

Collaborative agribusiness, exemplified by practices like Hashar, demonstrates the capacity of local communities to support each other, share resources, and overcome obstacles. This informal yet effective approach challenges conventional notions of alternative food networks by highlighting the role of communal bonds, trust, and shared values as alternative economic practices in sustaining the food system. As Afghanistan progresses, understanding and harnessing the strengths of these alternative practices will be crucial for fostering a resilient and locally rooted food system, even in the absence of formalized alternative food networks seen in developed countries.

4. Discussion

The above research findings have identified three key variations about AFNs specific to the Afghan context of conflict: operation under limited resources, the dominance of collaborative agreements, and the absence of formal AFNs. These in essence raise three corresponding fundamental questions, which this section will discuss: (1) are AFNs naturally suitable for Afghanistan and therefore represent a natural solution that is already set in stone?; (2) if collaborative agreements are extensive and Afghanistan is ostensibly performing better than global aid institutions expect, is there resilience in AFNs not previously noted in the extant literature?; and (3) is there an invisible and informal hand that is supporting the absence of formal AFN networks?

(1) *AFNs a natural solution?* The extant literature on AFNs, particularly that from America had argued for the luxury of organic practices that may be more abundant of resources (Guthman, 2004) and the focus on localness (Lin, 2020). This is perhaps a difficult concept to reason with when Afghan agribusiness people are constrained by poor infrastructure and naturally poor resources. They desire more support from the government and the returns of working without agricultural technology is not only uneconomical but also counter to environmental gains. Thus, in the case of Afghanistan, the 'return to land' principle is already in place, without choice. The solution called for by local farmers is to gain resource enhancement as a priority.
(2) *Resilience in AFNs?* The research has identified the unlikelihood of agribusiness success, and yet business is motivated other factors, such as religion. It is not clear how Islamic principles, such as Hashar, form an exact causal and scientific link to agribusiness survival other than the resilience of Afghans, not to give up, and the support of one-another. The idea that AFNs can be self-organized (Barbara and Dagnes, 2016) and local embeddedness (Grasseni, 2013) may support this claim.
(3) *An invisible and informal hand (revelation)?* The absence of any formal AFN in Afghanistan (eg. CSAs, or Fairtrade agreements), against AFN literature that defines it as an explicit application within Slow Food (see Edwards, 2016), suggests the impossibility of AFNs working and yet we have witnessed at least some survival. Thus, instead of the formal mechanisms that exist in developed country AFNs, there seems to be the presence of an invisible and 'informal' hand – some form of revelation – in support of how the difficult markets have operated.

Conceptualizing these three discussion points above, we can summarize that three components (beginning with the letter R – resilience, resource

enhancement and revelation) represent how collaborative agribusiness helps to facilitate food security and explicates the AFNs in Afghanistan (see Figure 1).

Figure 1 - Components of AFNs in Afghanistan

Conclusion

In exploring the dynamics of agribusiness in Afghanistan, two key operational points have surfaced. Resource limitations including water scarcity, energy inaccessibility, awareness of sustainable methods, and transportation constraints highlight the multifaceted nature of obstacles that obstruct the success of agribusinesses in Afghanistan. Insufficient water resources, reliance on non-eco-friendly energy sources, lack of awareness about modern farming techniques, and transportation bottlenecks collectively contribute to the struggle faced by farmers in the pursuit of sustainable and profitable agriculture.

From a policy perspective, the findings highlight the interconnectivity of these challenges, creating a complex landscape that demands comprehensive solutions. The responsibility falls on the government and stakeholders to address infrastructural limitations, ensure fair resource distribution, and promote sustainable agricultural practices. What makes it interesting is that, despite all these difficulties and challenges, the food security situation in Afghanistan is better than expected by FAO reports. Thus, the research found that there are no short supply chains in the country and alterity in the Afghan food system is defined based on alternative economic practices

such as collaborative agribusiness. Moreover, despite the overwhelming challenges, agribusinesses in Afghanistan exhibit an unexpected tenacity, sustained by the pillars of collaboration affected by religion, culture, and the sense of community inherent in the community, highlighting support and collaboration, cultural practices such as communal ceremonies, and the tradition of Hashar, and the strong bonds formed in rural communities. These findings collectively suggest that collaborative agribusiness plays a crucial role in mitigating the adverse effects of resource limitations and government support gaps. The study also acknowledges that the resilience observed in Afghan agribusinesses is intricately tied to religious values, cultural practices, and the close-knit nature of rural communities, which presents the attitude of care which is one of the main principles of the Slow Food movement. This unexpected resilience challenges conventional expectations and invites further research into the specific impacts of religion, culture, and rurality on sustainable economic practices, particularly in the context of collaborative agribusiness.

From these findings, we argue that the role of collaborative agribusiness in food security, in the context of Afghanistan, is driven by the 3Rs conceptualization – resilience, resource enhancement and revelation. Indeed, this simple argument is not without its limitations. We acknowledge the research was carried out mostly in one part of Afghanistan, despite being representative, cannot speak for all persons and all stakeholders. Given the political insecurities taking place at the time of the research, there may have been biases and reluctance in the interviewees opening up fully. Nonetheless, we believe these insights will at least augment and bring to the contemporary research agenda an understanding of AFNs that has not until now been explored for the remarkable context of Afghanistan.

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