

A fuzzy-set approach for multiple criteria decision making in sustainable consumption of organic food

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ABSTRACT

The study proposes a set of enablers of the consumer sustainable organic food consumption and detects the interrelationship between these attributes. This paper adopts the fuzzy set theory and decision-making trial and evaluation to explore the interrelationship between attributes, including consumer demographic aspect, psychological aspect, social-level aspect and stakeholder impact being explained through 13 criteria and being assessed by experts in the industry. The findings show that stakeholder impact and demographic aspect belong to a causal group and impact the other two aspects. The six most important attributes affecting sustainable consumption of organic foods are support and guidance from government support, mass media, education and research institutions, educational level, income status and consumer age. The study grants an alternative approach for sustainable consumption theory through providing a fuzzy-set theory for multiple criteria decisions making in sustainable consumption of organic food.

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1. Introduction

Organic food might provide ecological and social benefits, eco-innovation and sustainable innovation base for the food production system and sustainable development goals (Luu, 2019; Willer & Lernoud, 2019). However, organic products' output has met formidable barriers that have to be overcome; consumption of organic food is symbolic of the ethical value system, and consumers still face specific resistance during consumption (Grosplik, 2017; Kushwah et al., 2019; Vega-Zamora et al., 2019). Sustainable consumption is the consumption of sustainable products and involves various activities along the different stages from primary production to final consumption, which used to be supply-driven, has now become demand-driven (Liu et al., 2016). Increasing organic food consumption is often viewed as a more sustainable food provisioning system and enhances sustainability in the food system (Aschemann-Witzel & Zielke, 2015; Azzurra et al., 2019; Choudhary et al., 2019; Evans et al., 2017; Mork et al., 2017). While many researchers in developed countries have examined the impact of various factors in both individual and social aspects on consumption practices of consumer, researches related to sustainable purchase behaviour are limited in the Asian countries, especially in organic food area (Joshi et al., 2019; Liobikiene et al., 2016; Wang et al., 2014). Organic food is not a prevalent issue among research on sustainable consumption (Anantharaman, 2018; Dong et al., 2018; Kang et al., 2017; Kushwah et al., 2019; Verain et al., 2015). Some authors mentioned sustainable consumption, but in different products, the others analysed organic food purchase behaviour without sustainable context (Azzurra et al., 2019). Most previous research has predominantly focused on individual consumer attitude, behaviour or choice (Choudhary et al., 2019). This study grants significant enablers or determinants for sustainable behaviour on organic food among consumers in the situation of low transformation among consumption habits toward actual sustainable consumption behaviour (Joshi et al., 2019).

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Consumption behaviour of organic foods has become one of the most popular sustainable behavioural substitutes in the past few years (Minton et al., 2018; Testa et al., 2019; Vega-Zamora et al., 2019). Previous studies used a microeconomic theory approach, behavioural economics theory to explain consumers organic products purchasing behaviour and test for multiple product groups (Luu, 2019). Although previous studies strove to propose appropriate approaches to identify sustainable consumption enablers, the methods had not considered linguistic ambiguity in the complexity of real problems and the interdependence among attributes (Ajzen, 1991; Tseng et al., 2018). This paper proposes using consumer demographic aspects, psychological aspects, social-level aspects and stakeholder impact as enablers of sustainable consumption (Sun et al., 2019; Xu et al., 2018). The paper uses a fuzzy set approach and decision-making trial and evaluation laboratory (DEMATEL) to approach sustainable consumption in a manner that goes beyond expert opinions. The findings contribute to the current literature of sustainable consumption through (i) identifying and structuring a set of enablers for sustainable consumption; (ii) finding the cause-and-result relationship between each attribute of sustainable consumption; and (iii) granting both theoretical and managerial implications for decision-makers to ensure sustainability in consuming organic food. The study grants an alternative approach for sustainable consumption theory through providing a fuzzy-set theory for multiple criteria decisions making in sustainable consumption of organic food.

2. Literature review

In sustainable development perspectives, sustainable consumption refers to goods and services consumption behaviour that responds to actual needs and future generations' needs (World Commission on Environment and Development, 1987). Sustainable consumption behaviour might be presented in the four key dimensions, focusing on the ecological and socio-economic impacts of consumption behaviours (Geiger et al., 2017). Organic products are generally regarded as healthier, safer, better tasting, and more nutritious than conventionally produced products (Luu, 2019). The theory of planned behaviour and value theory has adopted sustainable consumption behaviour studies, based on perceived value effects on personal moral norms, beliefs, and attitudes (Han et al., 2020; Liobikienė et al., 2016; Scalco et al., 2017; Schwartz, 2006). The social cognitive theory is incorporated into the framework of reciprocal determinism to understand sustainable consumer behaviour, based on the assumption of the individual capability of control over their actions with environmental occurrences (Phipps et al., 2013).

2.1 Demographic aspects

Sustainable consumption has mainly focused on green consumer socio-demographic profiling (Kwon & Ahn, 2020). Most of the studies have examined mainly income, age, and education for the sake of parsimony (Tripathi et al., 2016). Previous studies which have used demographic predictors of behaviour are ambiguous, and there have been inconsistencies in the findings of previous literature (Coderoni & Perito, 2020; Gilg et al., 2005; Sun et al., 2019).

2.2 Psychological aspects

Psychological factor refers to individual attitudes regarding sustainable consumption behaviours (Gilg et al., 2005). Numerous scholars report weak linkage between attitude/intention and behaviour related to green behaviour (Barber & Deale, 2014; Chekima et al., 2017; Tripathi et al., 2016). Some empirical studies find that socio-psychological factors better explain environmentally conscious consumer behaviour (Coderoni & Perito, 2020). However, a small section of the existing research focuses on using socio-psychological factors to explain environmentally conscious consumer behaviour (Srivastava & Chawla, 2017). Thus, the application of reciprocal determinism and psychological factors as determinants of future sustainable behaviour would improve consumer behaviour, which provides insight with the role of individual factors for sustainable consumption (Joshi et al., 2019).

2.3 Social-level aspects

Social-level aspect refers to social conditions that affect green consumption, which provides conditions that facilitate or restrict behaviour (Han, 2020). In discussing the social cognitive theory system collectivism and social value, others guidance and the external situation orientation are suitable for summarising consumer green consumption behaviour (Sun et al., 2019). Due to the reason that the meaning of green consumption can be considered as similar to sustainable consumption, the social-level aspect as one enabler of sustainable consumption, which is proposed from the combination of structural theory, environmental sociology and consumption sociology (White et al., 2019).

2.4 Stakeholders impact

Stakeholders impact includes regulatory stakeholders, internal stakeholders and market stakeholders, which might influence the organisation's achievement (Simeone & Scarpato, 2020). Stakeholders participate in the decision-making process or influence the decision-making, whose interests are positively or negatively affected by the decision results (Golob et al., 2018; Torres-Ruiz et al., 2018; Zhuang et al., 2019).

3. Methods

The paper implemented the fuzzy DEMATEL to determine the origins of sustainable consumption behaviour and correlations among these antecedents, using linguistic preferences (Tseng et al., 2018). Table 1 shows fuzzy linguistic variables as a practical fuzzy aggregation approach (Opricovic & Tzeng, 2004). The analytical procedure is followed by Tseng et al. (2019).

Table 1
Fuzzy linguistics references

Linguistics references	l	m	u
Low	0	0.1	0.3
Very low	0.1	0.3	0.5
Medium	0.3	0.5	0.7
High important	0.5	0.7	0.9
Very high important	0.7	0.9	1.0

A small sample if required to decide on the Fuzzy Dematel approach, as it is not a statistically based technique (Chou et al., 2012). The sample consists of 11 experts are selected for interviews, including five professors with more than five years of research experience in customer behaviour, three organic food store owners with more than five years of business experience, and three local consumer representatives with more than five years of using organic food. The survey is based on purposive sampling and conducted between September and December 2020. The data is gathered by a direct interviewing method with on-the-job interview approach. The study adopts four aspects attributes: consumer psychological aspect (A1), demographic aspect (A2), social-level aspect (A3) and stakeholder impact (A4) with 13 criteria as indicated in Table 2.

Table 2
Proposed measurement

Aspects	Criteria
Consumer psychological aspect (A1)	C1 Consumer perception of consumption effectiveness
	C2 Attitude towards sustainable consumption behaviour
	C3 Consumer perception of sustainability knowledge
	C4 Environmental concern
Demographic aspect (A2)	C5 Educational level
	C6 Income status
	C7 Consumer age
Social-level aspect (A3)	C8 Consumption environment
	C9 Environmental pollution level
	C10 Environmental trends
Stakeholder impact (A4)	C11 Support and guidance from Government
	C12 Mass media
	C13 Education and research institutions

Regarding consumer psychological aspect (A1), four criteria have been selected: perceived consumer effectiveness (C1), attitude towards sustainable consumption (C2), perceived knowledge about sustainability (C3), environmental concern (C4) (Currás-Pérez et al., 2018; Joshi et al., 2019; Sharma et al., 2017; Taufique & Vaithianathan, 2018; Wang et al., 2014). Three criteria measure demographic aspect (A2): educational level, income status and consumer age (Paco & Lavrador, 2017; Sun et al., 2019). Educational level (C5) means that highly educated people report higher environmental knowledge levels (Geng et al., 2017; Joshi & Rahman, 2017; Mancini et al., 2017). Income status (C6) affects the environment perceived validity (Wang, 2017). Consumer age (C7) is positively related to sustainable consumption (Bulut et al., 2017). Social-level aspect (A3) mentions the social conditions that affect sustainable consumer consumption, including consumption environment (C8), environmental pollution level (C9), and environmental trends (C10) (Minton et al., 2018; Song et al., 2020; Sun et al., 2019). The impact of stakeholders (A4) on consumer behaviour consists of the impact of support and guidance from Government (C11), mass media (C12), education and research institutions (C13) (Pacheco-Blanco & Bastante-Ceca, 2016; Torres-Ruiz et al., 2018; Xu et al., 2018).

4. Results

4.1 FDM results

This study proposed 21 enablers regarding five aspects of evaluation. FDM summaries are shown in Tables 3, 4 and 5 with the threshold of 0.7297. Table 2 shows the linguistic terms are transformed into corresponding triangular fuzzy numbers. Table 4 presents the Delphi panel, indicate the four aspects have a critical level above the threshold of 0.7548, including consumer psychological aspect (A1), demographic aspect (A2), social-level aspect (A3), and stakeholder impact (A4). The final results are shown in Table 5 with four important aspects and 13 criteria employed to analyse in the DEMATEL and provide implication for practices.

Table 3

FDM screening out for enablers

Initial practices	l_p	u_p	D_p	Decision
C1	0.333721454	0.916278546	0.77752	Supported
C2	0.348801108	0.901198892	0.76747	Supported
C3	0.322679769	0.927320231	0.78488	Supported
C4	0.021351138	0.853648862	0.65243	Unsupported
C5	0.322679769	0.927320231	0.78488	Supported
C6	0.01197069	0.86302931	0.65869	Unsupported
C7	0.034162037	0.840837963	0.64389	Unsupported
C8	0.333721454	0.916278546	0.77752	Supported
C9	0.344477828	0.905522172	0.77035	Supported
C10	0.365163945	0.884836055	0.75656	Supported
C11	(0.001674304)	0.876674304	0.66778	Unsupported
C12	0.354956265	0.895043735	0.76336	Supported
C13	0.344477828	0.905522172	0.77035	Supported
C14	0.375107865	0.874892135	0.74993	Supported
C15	0.365163945	0.884836055	0.75656	Supported
C16	0.322679769	0.927320231	0.78488	Supported
C17	0.365163945	0.884836055	0.75656	Supported
C18	(0.021921702)	0.896921702	0.68128	Unsupported
C19	0.002341428	0.872658572	0.66511	Unsupported
C20	(0.015832166)	0.890832166	0.67722	Unsupported
C21	(0.015832166)	0.890832166	0.67722	Unsupported
Threshold			0.7297	

Table 4

FDM for aspects

	l_p	u_p	D_p	Decision
A1	0.177320231	0.927320231	0.784880	Supported
A2	0.155522172	0.905522172	0.770348	Supported
A3	0.177320231	0.927320231	0.784880	Supported
A4	0.134836055	0.884836055	0.756557	Supported
A5	0.132916083	0.890832166	0.677221	Unsupported
Threshold			0.7548	

Table 5

FDM result for aspects and criteria

Aspect	Criteria		
	Initial set	Final set	Practices
A1 Consumer psychological aspect	C1	C1	Perceived Consumer Effectiveness
	C2	C2	Attitude Towards Sustainable Purchasing
	C3	C3	Perceived Knowledge About Sustainability
	C5	C4	Environmental concern
A2 Demographic aspect	C8	C5	Educational level
	C9	C6	Income status
	C10	C7	Consumer age
A3 Social-level aspect	C12	C8	Consumption environment
	C13	C9	Environmental pollution level
	C14	C10	Environmental trends
A4 Stakeholder impact	C15	C11	Support and guidance from Government
	C16	C12	Mass media
	C17	C13	Education and research institutions

4.2 DEMATEL result

Table 2 shows the experts' assessment of correlations among attributes with the fuzzy linguistic scales. Table 6 indicates the fuzzy triangular numbers. As a result, Table 8 presents the connection matrix of consumer psychological aspect (A1), demographic aspect (A2), social-level aspect (A3), stakeholder impact (A4). Table 9 shows the cause-and-effect inter-relationships among attributes.

Fig. 1 shows that demographic aspect (A2) and stakeholder impact (A4) belong to the cause group, whereas the effect group includes psychological aspect (A1) and social-level aspect (A3). As a result, the demographic aspect (A2) and stakeholder impact (A4) are crucial aspects of sustainable consumption. Figure 1 proves the interrelationships among the four attributes. A4 has a substantial impact on the psychological aspect (A1) and medium impact on the social-level aspect (A3), while social-level aspect (A3) has a medium impact on the psychological aspect (A1). The effect of demographic aspect (A2) on the psychological aspect (A1) is medium, while the effect of demographic aspect (A2) on the social-level aspect (A3) is weak. Demographic aspect (A2) and stakeholder impact (A4) have no relationship with each other.

Table 6
Defuzzification procedure from experts

	A1			A2			A3			A4		
A1	[1.000	1.000	1.000]	[0.000	0.100	0.300]	[0.000	0.100	0.300]	[0.000	0.100	0.300]
A2	[0.500	0.700	0.900]	[1.000	1.000	1.000]	[0.500	0.700	0.900]	[0.500	0.700	0.900]
A3	[0.500	0.700	0.900]	[0.300	0.500	0.700]	[1.000	1.000	1.000]	[0.300	0.500	0.700]
A4	[0.700	0.900	1.000]	[0.300	0.500	0.700]	[0.500	0.700	0.900]	[1.000	1.000	1.000]
	xl	xm	xr	xl	xm	xr	xl	xm	xr	xl	xm	xr
A1	[1.000	0.600	0.200]	[0.000	0.000	0.000]	[0.000	0.000	0.000]	[0.000	0.000	0.000]
A2	[0.000	0.000	0.000]	[1.000	0.900	0.700]	[0.500	0.600	0.600]	[0.500	0.600	0.600]
A3	[0.000	0.000	0.000]	[0.300	0.400	0.400]	[1.000	0.900	0.700]	[0.300	0.400	0.400]
A4	[0.400	0.400	0.200]	[0.300	0.400	0.400]	[0.500	0.600	0.600]	[1.000	0.900	0.700]
	xls	xrs		xls	xrs		xls	xrs		xls	xrs	
A1	1.000	0.333		0.000	0.000		0.000	0.000		0.000	0.000	
A2	0.000	0.000		1.000	0.875		0.545	0.600		0.545	0.600	
A3	0.000	0.000		0.364	0.400		1.000	0.875		0.364	0.400	
A4	0.400	0.250		0.364	0.400		0.545	0.600		1.000	0.875	
	zij			zij			zij			zij		
A1	0.667			0.000			0.000			0.000		
A2	0.500			0.875			0.576			0.576		
A3	0.500			0.378			0.875			0.378		
A4	0.678			0.378			0.576			0.875		

Table 7
Initial direct relationship matrix of attributes

	A1	A2	A3	A4
A1	0.688	0.315	0.350	0.384
A2	0.427	0.771	0.403	0.314
A3	0.530	0.278	0.738	0.402
A4	0.595	0.243	0.510	0.750

Table 8
Total interrelationship matrix of attributes

	A1	A2	A3	A4
A1	2.902	1.843	2.397	2.257
A2	3.039	2.310	2.676	2.435
A3	3.169	2.041	2.919	2.548
A4	3.469	2.183	3.023	2.955

Table 9
Driving and dependence power of attributes

	D	R	D+R	D-R
A1	9.398	12.579	21.976	(3.181)
A2	10.461	8.377	18.837	2.084
A3	10.677	11.015	21.692	(0.337)
A4	11.630	10.195	21.825	1.434
Max			21.976	2.084
Min			18.837	(3.181)
Average			21.083	0.000

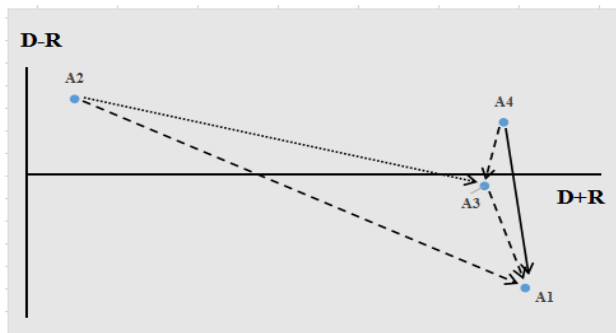


Fig 1. Causal interrelationships diagram among the aspects



Fig 2. Cause and effect diagram of criteria for practical improvement

The initial and overall reciprocal relationship matrix is shown in Table 10, Table 11. The cause-and-effect diagram of the criteria may be developed based on driving and dependence power, as shown in Fig. 2. Therefore, support and guidance from Government (C11), mass media (C12), education and research institutions (C13), educational level (C5), income status (C6) and consumer age (C7) are six causal criteria for sustainable consumption. Fig. 2 shows the driving and dependence power among 13 criteria with their groups. The finding pays attention to six criteria which derived from causal aspects demographic aspect (A2) and stakeholder impact (A4) and belong to causal group from DEMATEL result including support and guidance from Government (C11), mass media (C12), education and research institutions (C13), educational level (C5), income status (C6), consumer age (C7).

Table 10

Initial interrelationship matrix of criteria

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13
C1	0.733	0.516	0.389	0.537	0.261	0.260	0.253	0.401	0.441	0.351	0.225	0.278	0.242
C2	0.551	0.724	0.437	0.486	0.278	0.297	0.306	0.469	0.490	0.453	0.349	0.383	0.317
C3	0.516	0.568	0.741	0.551	0.345	0.310	0.338	0.383	0.403	0.471	0.343	0.381	0.333
C4	0.483	0.551	0.493	0.715	0.278	0.261	0.288	0.433	0.505	0.434	0.399	0.382	0.384
C5	0.434	0.503	0.473	0.466	0.778	0.420	0.267	0.416	0.489	0.471	0.328	0.377	0.379
C6	0.343	0.434	0.437	0.503	0.398	0.776	0.357	0.401	0.457	0.439	0.346	0.365	0.295
C7	0.380	0.377	0.406	0.465	0.399	0.418	0.786	0.453	0.406	0.369	0.278	0.379	0.259
C8	0.480	0.515	0.507	0.550	0.381	0.364	0.338	0.774	0.542	0.489	0.430	0.519	0.417
C9	0.465	0.517	0.492	0.620	0.363	0.293	0.269	0.471	0.738	0.524	0.484	0.535	0.450
C10	0.500	0.532	0.507	0.552	0.362	0.275	0.286	0.539	0.594	0.745	0.501	0.501	0.467
C11	0.463	0.552	0.557	0.550	0.433	0.347	0.268	0.570	0.509	0.576	0.776	0.536	0.536
C12	0.478	0.547	0.505	0.484	0.310	0.292	0.234	0.521	0.491	0.525	0.415	0.769	0.485
C13	0.431	0.500	0.507	0.517	0.450	0.191	0.235	0.487	0.526	0.476	0.416	0.453	1.000

Table 11

Total interrelationship matrix of criteria

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13
C1	0.552	0.557	0.505	0.569	0.375	0.336	0.318	0.497	0.525	0.490	0.397	0.444	0.417
C2	0.588	0.659	0.578	0.633	0.427	0.385	0.368	0.572	0.600	0.570	0.471	0.521	0.486
C3	0.594	0.648	0.638	0.656	0.447	0.396	0.381	0.569	0.598	0.585	0.479	0.531	0.498
C4	0.585	0.641	0.596	0.677	0.433	0.384	0.369	0.574	0.610	0.576	0.486	0.529	0.504
C5	0.594	0.653	0.611	0.657	0.528	0.424	0.378	0.588	0.626	0.599	0.489	0.544	0.519
C6	0.555	0.615	0.581	0.637	0.449	0.465	0.378	0.563	0.596	0.570	0.472	0.520	0.484
C7	0.541	0.584	0.555	0.609	0.435	0.395	0.435	0.552	0.567	0.539	0.444	0.504	0.460
C8	0.651	0.709	0.667	0.726	0.502	0.448	0.421	0.695	0.687	0.652	0.547	0.613	0.569
C9	0.643	0.702	0.658	0.730	0.494	0.431	0.405	0.641	0.710	0.651	0.551	0.610	0.569
C10	0.662	0.720	0.675	0.735	0.505	0.437	0.416	0.666	0.703	0.700	0.565	0.617	0.584
C11	0.687	0.756	0.714	0.768	0.540	0.470	0.433	0.701	0.721	0.704	0.634	0.651	0.623
C12	0.629	0.690	0.644	0.691	0.473	0.420	0.389	0.634	0.656	0.636	0.527	0.632	0.562
C13	0.636	0.699	0.660	0.712	0.509	0.412	0.398	0.643	0.677	0.643	0.539	0.596	0.659

Table 12

Driving and dependence power of criteria

	D	R	D+R	D-R
C1	5.982	7.916	13.898	(1.934)
C2	6.858	8.635	15.493	(1.777)
C3	7.020	8.081	15.101	(1.060)
C4	6.965	8.799	15.764	(1.835)
C5	7.209	6.117	13.326	1.093
C6	6.886	5.403	12.289	1.483
C7	6.619	5.087	11.706	1.532
C8	7.887	7.895	15.783	(0.008)
C9	7.796	8.276	16.072	(0.481)
C10	7.985	7.916	15.900	0.069
C11	8.403	6.604	15.006	1.799
C12	7.582	7.313	14.895	0.269
C13	7.782	6.933	14.715	0.849
Max			16.072	1.799
Min			11.706	(1.934)
Average			14.611	0.000

5. Discussions and managerial implications

The finding identifies two attributes of the causal group, consisting of demographic aspect and stakeholder impact. In particular, stakeholder impact has a significant impact on the effect group two factors, including the consumer psychological

and social-level aspects, which demonstrates the role of stakeholders in consumers and the community and promotes sustainable consumption (Zhuang et al., 2019). Besides, the demographic aspect is also identified as the influential variable in the group of proposed attributes. Demographic aspects affect community psychology and behaviour, but this effect is weaker than the stakeholder impact's impact. This shows that as customer demographic characteristics change, their psychology for sustainable consumption changes, thereby changing consumption trends in the community and towards sustainable consumption goals (Sun et al., 2019). Demographic aspects reflect consumer characteristics that affect their consumption behaviour. In this study, three demographic characteristics are studied: educational level, income status and consumer age (Sun et al., 2019; Paco & Lavrador, 2017). Sustainable consumption is considered to increase with age, income and education. The demographic aspect of age and demographic factors led to greater awareness of consumer behaviour's impact on the environment and society. With a higher income, consumers tend to choose products that are safe for their health and safety for the environment and society. Demographic aspects have a significant impact on the sustainable consumption of organic food. However, its impact on psychology and social-level aspect is negligible. This can be explained by the product-specific characteristics, which is inherently a green and safe product that customers of all ages, levels and incomes have demand and priority to use.

Stakeholder impact belongs to the causal group. This attribute substantially impacts consumer psychology and significantly affects the social-level aspect (Pacheco-Blanco & Bastante-Ceca, 2016; Xu et al., 2018). Stakeholder impact is considered to be the most crucial factor affecting sustainable consumption behaviour. Support and advice from the Government, educational and research institutions, and the mass media information about sustainable consumption to all customers improve their understanding of their consumption behaviour on the environment and society. When customers adjust their consumption behaviours more positively, they create a community with positive behaviours, protecting the environment, reducing site and supporting the trend of green consumption. This is also particularly relevant for organic food consumption behaviour as this is not yet quite popular with all customers in the market. The participation of stakeholders helps consumers better understand the product and promote product consumption. Psychological aspects reflect different customer psychology features about sustainable consumption (Joshi et al., 2019; Wang et al., 2018; Sharma et al., 2017). Meanwhile, social conditions' social-level aspects affect customer behaviour such as consumption environment, environmental pollution level, and environmental trends (Sun et al., 2019; Song et al., 2020). The findings show that two aspects of the causal group influence both attributes. Besides, the social-level aspect has a significant impact on the customer psychological aspect. This proves that living in a community where everyone is aware of sustainable consumption and environmental protection affects consumer psychology and makes them aware of environmental issues, take care of the environment and realise their role in the environment and society.

The research results divide the initial 13 attributes into two groups, causal group and effect group. Among them, six attributes of the causal group are considered the most important, including support and guidance from the Government, mass media, education and research institutions, educational level, income status, and consumer age. Support and guidance from the Government are among the most critical attributes of sustainable consumption. The Government needs to harmonise solutions such as raising awareness for consumers and paying particular attention to mobilise businesses committed to environmental protection and market green, clean and safe products. Specific and direct instructions from the Government will be the official information channel to improve the business and consumption of organic food. Mass media plays a crucial role in promoting sustainable consumption, as it updates consumers with the issues, knowledge, benefits, and harms of their activities without sustainable consumption. Mass media highlights the impact created by companies, governments and the public, suggesting areas of change. Social media allows citizens and companies to solicit support from the Government and domestic and foreign organisations for initiatives and advocacy to address consumer issues. To effectively exploit the media's benefits to bring green products closer to consumers, specific instructions and directions from the Government and management levels are needed. Through the media, communication programs need to be controlled in terms of content to increase consumer understanding, concern, and positive attitudes towards the environment and media organisations need to be followed and access reliable, substantive data on sustainable consumption. Education and research institutions carry out two critical activities: educating consciousness and improving production towards sustainable consumption. Educational institutions play the role of propaganda and advocacy for building environmentally friendly lifestyles and sustainable consumption, forming a sense of environmental protection and building a low-site and eco-friendly society. Besides, educational institutions need to enhance training and disseminate knowledge, policies and laws on sustainable production and consumption for businesses and workers to improve human resources for real-current practices of sustainable production and consumption. Enhancing educational institutions supporting the role in protecting consumer interests in propaganda, dissemination, legal education, and knowledge of sustainable production and consumption for consumers is also extremely necessary. Besides, research organisations' role is to improve the production process to reduce the site to the environment and create safe products for consumers and the community. In order to do this, companies need appropriate investments in research and development.

Promoting sustainable consumption also needs to consider demographic factors, including educational level, income status, consumer age. Previous studies show that older people are, the more likely to consume sustainably because they receive knowledge from surrounding sources. Besides, when income increases, people will also care about sustainable consumption, especially for organic products, because this item price compared to conventional products, is still relatively high.

Educational level is also a factor that affects sustainable consumption because the more people understand, the more they care about the environment. This shows that to promote sustainable consumption in society, the Government and educational institutions need to promote mass media for people of any age, any educational level to understand, and a sense of sustainable consumption. Simultaneously, research to improve the production process to lower the cost of green products, which is incredibly organic in this study, is also essential. As a result, it can form a common sustainable consumption habit in society. This study has contributed to the sustainable consumption theory by identifying the critical enablers affecting consumers, especially in organic food consumption. From the finding, two enablers of the causal group that stakeholders need to consider to build appropriate strategies are demographic and stakeholder impact. A demographic aspect includes age, education, and income, suggesting that at a certain age, with good income and high education level, the consumer is motivated to make sustainable consumption. This study also shows the impact of the demographic aspect on the psychological aspect and the social-level aspect of consumers. Therefore, raising consumer awareness and psychology towards sustainable consumption should raise their qualifications and improve consumers' incomes at an appropriate age. The stakeholder impact also affects sustainable consumption through channels such as support from the Government, information from research and education organisations, and mass media propaganda. Stakeholders need to understand their role to take appropriate actions to promote sustainable consumption, mostly organic food, as the study mentioned.

This paper has some limitations. Firstly, this study addresses the enablers of sustainable consumption in the consumer perspective while ignoring other subjects such as firms or the Government. Future studies may further investigate the sustainable consumption behaviour of these stakeholders. Secondly, this study uses fuzzy DEMATEL method with the qualitative information from the expert evaluation; however, the number of experts participating in the study is limited. The following studies should expand the sample to be able to test its validity. Finally, this study is conducted on sustainable consumption of organic food, while many other products also need to develop appropriate consumption strategies towards overall sustainable development. This is an excellent opportunity for future research to develop both in width and depth in the field of sustainable consumption.

6. Conclusions

This study proposes a set of enablers of the consumer sustainable organic food consumption, and to detect the interrelationship between these attributes. The fuzzy DEMATEL method identifies the most critical enablers and the degree of influence among attributes. This study points out the critical influencing of the demographic and stakeholder impact on sustainable consumption behaviour for organic food. These two aspects affect two other aspects of the effect group, including the consumer psychological and social-level aspects with different impact levels. Besides, 13 criteria are initially classified into an autonomous quadrant, dependent quadrant, independent quadrant and linkage quadrant. Six criteria from the measurement scale of two causal aspects: demographic and stakeholder impact are classified into the causal area, such as support and guidance from Government, mass media, education and research institutions, educational level, income status, and consumer age. These are also the six most important criteria for sustainable consumption. The study grants an alternative approach for sustainable consumption theory through providing a fuzzy-set theory for multiple criteria decisions making in sustainable consumption of organic food.

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