COFFEE NARRATIVE WITH A FOCUS ON CERTIFICATION SCHEMES: ETHIOPIAN AGRI-FOOD VALUE CHAIN IN A GLOBAL MARKET CONTEXT

Hiroko Oe[1*], Yasuyuki Yamaoka[2] and Hiroko Ochiai[3]

[1]The Business Scholl, Bournemouth University, 89 Holdenhurst Road, Bournemouth, BH8 8EB, UK; hoe@bournemouth.ac.uk

[2]Faculty of Society and Industry, The Open University of Japan, 2-11 Wakaba, Mihama-ku, Chiba, Chiba Prefecture 261- 8586; yamaoka-y@ouj.ac.jp

[3]Department of Plastic and Reconstructive Surgery, Laboratory of Regenerative Medicine, Division of Hearing and Balance Disorder, National Institute of Sensory Organs, National Hospital Organization Tokyo Medical Center, Meguro, Tokyo, Japan: ochiroko@gmail.com

ABSTRACT

Certification programs that simultaneously promote ecologically sustainable agriculture and improve livelihoods are being used on a global scale, and are expected to contribute to aspects such as community self-reliance and im-proved working conditions for workers. However, few studies have conducted detailed analyses of stakeholder per-ceptions of certification systems and their implications for policy.

This study focuses on the value chain of certified Ethiopian coffee and qualitatively examines the prospects and challenges of the coffee certification system from three perspectives: 1) Ethiopian coffee farmers, 2) supply chain actors and consumers in Japan, the largest importer and consumer, and 3) experts on certification systems in the agricultural sector in developing countries.

Based on the findings of a total of 24 stakeholders, we concluded that for sustainable success of agribusiness and balanced development of local communities, it is necessary to (1) increase awareness of certification systems in production areas, (2) resolve the imbalance of interests between production areas and consumption areas, and (3) improve working conditions for women workers and spread awareness for this purpose.

Keyword: Agri-food Sector; Sustainable Supply Chain; Coffee; Value Chain; Certification; Resilience; Labour Condi-tions; Un Sdgs.

1. INTRODUCTION
1.1. Background of the study: Certified agricultural products

The basic idea of the agricultural product certification system is that 1) certification bodies can assess and certify the ecological and ethical standards of production processes from a third-party perspective, and products that have passed the assessment can be labelled with a certification label; 2) the certification label allows consumers to make environmentally friendly product purchasing decisions; and 3) the certification label is used to ensure that products are produced in an environmentally friendly way. 3) Contribute to improving the working environment and livelihood of workers involved in the production process by encouraging ethical agricultural practices. Certified products also have a statement of record that can enhance traceability and help stakeholders in the supply chain to recognise the value of safe and reliable supply and

consumption, thereby it is expected to create an appropriate value chain which contributes to the maintenance of a desirable ecosystem, including farmland and forest conservation (Galera-Quiles et al., 2021).

1.2. Research gap

Increased awareness of environmental conservation and climate change in recent years has led to a certain amount of research assessing the effectiveness of agricultural certification in ecosystem conservation. For example, Haggar et al. (2015) found that organically certified coffee plantations in Costa Rica, Guatemala and Nicaragua had higher species richness, shade and stratification than conventional coffee plantations. However, few studies have comprehensively considered the impact of certification systems on socio-economic activity stakeholders linked to the global supply chain, including the coffee-growing areas concerned, by rethinking the sustainable development of coffee-growing areas from the perspective of the social system as a whole. This paper examines how coffee produced in coffee-growing regions is embedded in global supply chain networks originating from coffee-growing regions and how value chains on global networks are constructed. In particular, it discusses the challenges and prospects of coffee certification schemes, based on primary data collected from stakeholders on how the introduction of coffee certification schemes works to strengthen sustainable supply chains.

2. LITERATURE REVIEW
2.1 Certification programmes impact: Context of Sustainable Development Goals

Let us now read the certification system in the context of SDG 12 Responsible production and responsible consumption. The effectiveness of certification programmes has been studied along multiple dimensions, but in the Rainforest Alliance (RA), the largest actor in the certification system, its main objectives are forest, climate, workplace and livelihood (Munasinghe et al., 2021). Aspects such as increased income through farmers enjoying premium price premiums and a more resilient supply chain to global markets through expanded sales channels are understood as benefits of certification schemes (Addisie et al., 2022).

While it has been suggested that certification promotes better agricultural management and crop quality, operational challenges of certification schemes generally include difficulties in gaining the understanding and consent of relevant stakeholders, the time and costs involved in the stable operation of the schemes, and the difficulty of transparent and reliable implementation of administrative procedures (Gatti et al., 2022).

For example, if we look at the European Union (EU) as a mass-consuming region, sustainability in particular is becoming an increasing priority (Pietrzyck et al., 2021). The European Green Deal, the food supply chain and agricultural quality standards will increasingly become a major concern for food importing countries and regions, and SDG 12's aim of responsible production will continue to be an important guiding principle for producers, with increasing expectations for certification schemes to prove it (Schröder et al., 2019; Mausch & Hambloch, 2020).

In the light of the objectives of SDG 12, it is a major responsibility to make use of certification schemes to ensure responsible production on production land. The monitoring and auditing system of certified farmland is essential for the proper operation of the certification system and for maintaining the quality of the product. However, not many studies have addressed this auditing system in depth.

van Hille et al. (2020) suggest that cross-sector partnerships are an effective way to achieve sustainable agriculture in ethical and responsible production areas, and that stakeholders should create a platform for mission-driven coffee production. In the same way, the Contreras-Médecins Sans Frontières Similarly, Contreras-Medina (2020) propose the design of ICT-enabled schemes to ensure sustainable supply chains, as knowledge sharing and transfer are important. They also emphasise that in order to explore the sustainability of strategic coffee production, mechanisms should be implemented to encourage consumers to value and purchase coffee, even if it is slightly more expensive. This is because without the understanding and support of consumers, it is certainly not easy to ensure the sale of sustainable coffee, which tends to be expensive (Ut-tha and Chung, 2021; Carr et al., 2021).

2.2. Sustainable agriculture and livlihood

In response to demands for safety and traceability of agricultural products and environmental protection through agriculture, GLOBAL G.A.P. (Global Gap) certification, which represents an international standard for good agricultural practices, is being promoted; it will be the standard for foodstuffs provided at the 2020 Tokyo Olympic and Paralympic Games, and in 2017 In 2006, part of the costs related to certification became eligible for subsidies. Global GAP is a guideline for sustainable agriculture. G.A.P. (Gap) stands for 'GOOD', 'AGRICULTURAL' and 'PRACTICES' and is a code or guideline that describes in practical terms what agriculture should look like. One international certification system that certifies them is called Global GAP (Quartey et al., 2021).

Its predecessor was Europe GAP, which was established in the EU in 1997 and later became Global GAP in 2007, and today it is widespread in 130 countries around the world. It also cooperates with the UN's Sustainable Development Goals (SDGs) initiative. 'Global GAP includes 218 production process management items in the fruit and vegetable sector. These comprise four pillars - food safety, traceability, occupational safety and health of workers, and environmental protection, including biodiversity - with the ultimate aim of sustainable agricultural production (Holzapfel et al., 2014; Wu et al., 2018).

Certifications are also often confused with the use of other quality assurance certification marks. It is not a certification for the quality of the produce, but for the management of the production process. Certification for the management of production processes has another important meaning. The GAP should not aim to converge on a single standard, such as a 'global standard', but should take into account the characteristics of agriculture in each country and region, taking into account the past history, natural conditions, climate and local conditions in a comprehensive manner, and not allowing extraneous standards to be imposed. This concept is the very idea of value co-creation and is an expression of the objective to respect the characteristics and functions of indigenous farming methods and communities, including coffee production (Hou et al., 2015).

The focus of this study is not on aspects of the effectiveness of certification schemes in mitigating forest degradation. It is whether certification schemes can lead to a stable supply of coffee, support sustainable coffee businesses and contribute to the operational resilience of a stable coffee supply chain. In addition, can the newly introduced certification system contribute to the resilience of the coffee supply chain and create unique value for the farming methods of indigenous production areas with their own cultural, natural and historical backgrounds? And there are actually not many studies that focus on these social aspects and try to capture the challenges and look at the potential of certification schemes ethnographically through surveys of the attitudes of

stakeholders engaged in the coffee industry and certification schemes (Oya et al., 2018; Woyesa et al., 2011).

Ethiopia is one of the most biodiverse countries in the world, being included in one of the 35 biodiversity hotspots. Among them, the few remaining virgin forests are a precious human asset as a natural and cultural treasure, especially the Kafa Biosphere Reserve in south-west Ethiopia, which is known as the birthplace of Arabica coffee. Ethiopia, with its mountains rising to over 2,500 m above sea level, has a climate that is ideal for coffee production due to the large difference in temperatures.

Agriculture is the main industry in Ethiopia, and coffee is the most important and largest product. It is said that the name of the region, Kaffa, is the origin of the word coffee coffee. The Abyssinian Plateau (Ethiopian Plateau), which stretches across south-west Ethiopia and the Kaffa region, is considered the origin of coffee and still produces a lot of coffee. It is a production area where the producers of the coffee beans can be 100% identified as to who and where they were grown, and also has a reputation for the quality of the beans, with a uniform grain quality.

2.3. Supply chain of Ethiopian Coffee
2.3.1. Ethiopian coffee supply chain networks and management

Amano (2014) examined the global supply chain for Ethiopian coffee. Worako (2011) drew attention to the volatility of developing country coffee prices, including Ethiopian coffee, in the global market and raised the issue from a value chain construction perspective. These issues were shared by Boansi and Crentsil (2013), who discussed the importance of securing sources of competitive advantage, export destinations and export plan preparation in coffee export strategies. Their interest and awareness of the issues were always focused on ensuring the economic development of the producing regions and the economic benefits to producers. Similarly, Lerner et al., (2021) demonstrated the importance of collaborative support from multiple stakeholders in establishing marketing channels in the supply chain of coffee products from developing countries. These research perspectives are now, more than ever, important issues in international business management in developing countries, as the achievement of the UN SDGs has recently become a pressing global issue.

Lopoyetum et al. (2014) focused on the issue of unfair trade in the supply chain, examined the drivers of the difference between farm-gate and FOB (Free On Board) prices in the world's major Arabica coffee producing countries. The empirical study was conducted based on extensive secondary data, taking into account the literature on governance in agri-food chains, focusing on the impact of transparency and support systems on negotiations, the significance of support infrastructure for communication and information activities, the function of transport infrastructure. The results highlight that heterogeneity of institutions and infrastructure has a significant impact on transaction prices.

In other words, the transaction costs of institutional and infrastructural heterogeneity lead to the intervention of intermediaries in the coffee supply chain, which in turn reduces the margin received by coffee farmers. Eliminating these inefficiencies will lead to greater transparency and lower transaction costs in the coffee trade, paving the way for a contribution to the UN SDGs. Ultimately, the return of benefits to primary stakeholders in the Ethiopian coffee sector will lead to a significant improvement in the living standards of the poor coffee farmers at the source of the value chain (Kabeta et al., 2021).

2.3.2. Ethiopian coffee value chain and feedback to producers

Kabeta et al. (2021).highlighted the importance of the return of benefits and advantages to producers in the consideration of agricultural value chain management; Dempsey (2006) focused on the functioning of Ethiopian cooperatives and the importance of institution building to link coffee producers to international markets and tireless efforts to strengthen value chains and measures to improve the system are discussed; Devaux et al. (2018) similarly propose a cooperative scheme of agricultural innovation and stakeholder inclusion to strengthen and stabilise value chains, as well as a scheme for developing countries and It proposes a model for agribusiness value co-creation in emerging economies.

Ensermu (2020) unpacked the case of the coffee-growing region of Oromia, Ethiopia, analysing, inter alia, factors for coffee value chain development based on the relationships among upstream supply chain members; Utrilla-Catalan et al. (2022) paradoxically, the coffee The more global value chains are developed, the more complex networks of social systems are discussed, where the return of benefits to the producing country is not as smooth as it could be.

In the light of these discussions, let us discuss the functions to be performed by certification of agricultural products, including coffee, which is the subject of this study, in the context of value chains.

Gboko et al. (2021) discussed the importance of supply chain network orchestration and harmonisation, focusing on multi-stakeholder interactions and contributions, with a focus on the cocoa certification system. Van Holt et al. (2021) discussed the financial benefits of sustainable agricultural supply networks in the context of the introduction of certification schemes, highlighting the potential and prospects of certification schemes; McLoughlin and Meehan (2021) similarly discussed the institutional construction and implementation of sustainable organisations in the effects are discussed in the case of a chocolate supply network.

In addition, Tong et al. (2022) focused on the relationship between supply chain security certification and the operational performance of companies on the importing country. They empirically examine how security certification affects the operational performance of import-consumer firms in situations where goods arrive from the country of production, especially for importers who rely on smooth cross-border logistics.

2.4 Research questions
This study focuses on the value chain in the global supply network of certified Ethiopian coffee, and examines the role of Ethiopian coffee farmers, their supply chain stakeholders and consumers in Japan, the largest importer and consumer of Ethiopian coffee, and the certification systems in the agricultural sector in developing countries. From the perspectives of three groups of experts, the paper qualitatively assesses the prospects and challenges of coffee certification systems, the issues that need to be transcended to build sustainable communities, and the pathways to solutions. To achieve this aim, the following research questions were set:
(1) What are stakeholders' perceptions and evaluations of the certification programme?
(2) What factors are essential for certification programmes to contribute to maintaining and improving the autonomy and sustainability of sustainable coffee-growing areas?
(3) What mechanisms are needed to ensure that certification programmes are meaningful for the agri-food business sector and consumers through responsible production and responsible consumption, as highlighted in UN SDG 12, as well as being recognised by a wide range of stakeholders in the supply chain network, leading to improved welfare?
Focusing on the value chain of certified coffee in Ethiopia, this study qualitatively assesses the prospects and challenges of coffee certification schemes, challenges to overcome and pathways to

solutions for building sustainable communities from the perspectives of three groups: coffee farmers in Ethiopia, supply chain actors and consumers in Japan, the largest importer and consumer of coffee, and experts on certification systems in the agricultural sector in developing countries.

3. METHOD
3.1. Approach: Semi-structured questionnaire design

The study involved qualitative interviews using a semi-structured questionnaire with three groups. The first interview with Ethiopian coffee farmers from two Ethiopian coffee-growing regions: the Gera region in the south-west and the Ethiopian Highlands in the north-east.

A total of eight people were interviewed as the first group, with the local coordinator, who is responsible for coffee production in the region and manages and monitors the certification system, as the gatekeeper. Then second group of 10 people as importing market stakeholders, including coffee importing organisations, wholesale associations, Coffee Meisters Association, coffee retailers, and Ethiopian coffee consumers. These two groups of interviews were followed by the third group of six participants, who were academic and consultant experts with expertise in certification systems and agricultural policies in developing countries (Table 1).

Figure 1. Research area (Ethiopian Highlands).

3.2. Data collection and text mining analysis

Interviews were based on a semi-structured questionnaire covering the RQs developed from the literature review, as described above. Interviews were conducted remotely by ZOOM and the interview data obtained were transcribed by ZOOM's automated speech transcription facility. Interviews conducted in this way generally averaged approximately 45 minutes per person (minimum 31 minutes, maximum 76 minutes).

The coding process enabled the authors to determine hidden underlying themes in the participants' perspectives (Higuchi, 2020). The analysis was conducted using NVivo 12, KHcoder (a free open-source text mining software), and UserLocal, another free open-source text mining software. The text mining analysis produced word frequencies, word clouds and keyword proximity maps (Bayrak, 2022), followed by a comprehensive examination of the textual data of the three groups of interviewees by triangulation (Renz et al., 2018).

This process of analysis produced a mind map that visualised the cognitive and evaluative stages of the participants' perceptions and evaluations of the project themes. The text mining results contributed to the process of identifying links between the main themes and codes, which were then compared to the context of the relevant literature. The findings from the keywords and topic links were then compiled into a revised conceptual framework with recommendations for relevant practitioners and researchers.

Table 1. Primary data collection

Interviewees	number
Coffee farmers and managers	8
Coffee importing and distributors & coffee consumers in Japan	10
Academic and consultant experts in the field of certification systems and agricultural policies in developing countries	6
Total	24

4. FINDINGS AND ANALYSIS
4.1. Text mining analysis
4.2.1. First group of interviews (Ethiopian coffee farmers and managers)

In order to understand the overall trends in the interview data, we used text mining software, NVivo Ver.26 and UserLocal, to decipher the phases of their interest and evaluation. Figure 2 visualises the differences in utterances on key topics (nodes) in the first group of statements, showing that among the five common nodes, the main concerns of farmers (above) and managers (below) are weighted towards different points. Farmers spent almost the entirety of their remarks on securing jobs, followed by the difficulties of the procedures related to the assessment of certification. Senior members with management responsibilities, on the other hand, devote most of their remarks to the process of certification and its auditing and assessment.

The Nodes developed for the analysis were:

1. Certification
2. Work, working, employment
3. Assess
4. Audit
5. Job creation

In terms of actual comments, the former are more likely to comment on the financial benefits and day-to-day labour than on their interest in the certification system, while at managerial level, there is a high sensitivity to inspections by auditors.
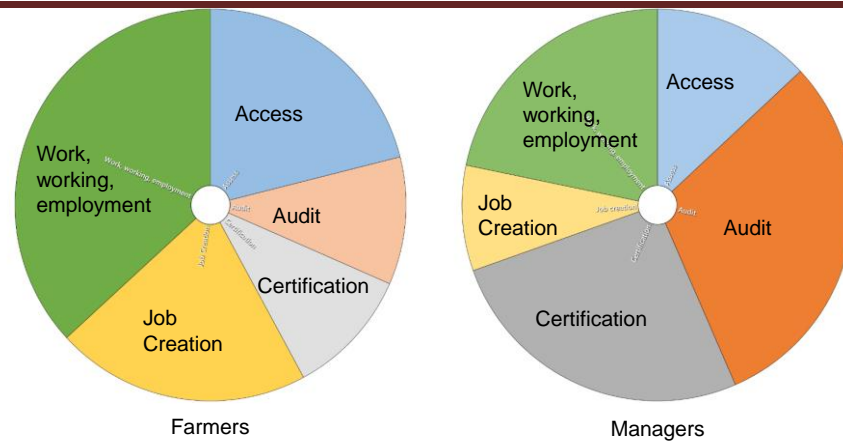
Figure 2. Key themes (nodes) discussed from two sub-groups (farmers & managers)

Next, from the same text data, mining techniques are used to examine the tendency of both groups to say the same thing: Figure 3 compares and arranges the words biased towards farmers' statements and those biased towards management statements. From this figure, it is possible to ascertain what the main tendencies of utterances of both sub-groups are. This trend parallels the characteristic trend identified in Figure 2, which compares the six nodes. Figure 3 shows that farmers value coffee plantations as more employment opportunities, youth employment, whereas managers value the introduction of certification schemes with the support of the public sector and international cooperation agencies, but also, they frequently mentioned the procedure of auditing and monitoring suggesting that they acknowledge the importance of compliance.

Figure 3. Comparative analysis of frequently mentioned words from both interviewee sub-groups

Figure 4 shows a table in which the words appearing in the two documents are grouped according to which of the two documents they occur in, in order to confirm the results of the text mining analyses. The words in the groups tend to be arranged in order of their frequency of occurrence and the results of the qualitative assessment, based on the results as above, allow us to

understand the differences in the attitudes of the two groups regarding the aspects and attributes of the coffee certification system that they are interested in.

Farmers	noun	Managers		Farmers	verb	Managers		Farmers	adjective	Managers
41	certification	59		0	like	100		0	big	100
87	coffee	13		50	work	50		0	difficult	100
0	auditor	100		33	go	67		0	enough	100
100	plantation	0		100	hear	0		0	first	100
58	forest	42		66	know	34		100	hard	0
31	system	69		33	maintain	67		0	much	100
31	u	69		20	improve	80		100	young	0
100	industry	0		0	assess	100		0	convenient	100
0	activity	100		0	believe	100		0	dangerous	100
0	condition	100		0	call	100		0	decent	100
0	farm	100		50	come	50		0	distant	100
0	number	100		0	comply	100		0	economic	100
18	audit	82		0	conduct	100		0	effective	100
41	work	59		100	cultivate	0		0	essential	100
67	field	33		0	develop	100		0	financial	100

Figure 4. Comparison of the tendency of words to appear in two groups' interviews

Characteristic statements from the first group of interview data are summarised below.
Farmers' comments:
'We rarely think about the places where coffee is consumed. Coffee is a common material for us and a familiar crop, but it is unlikely to generate profits'

'Without warehousing and transport networks, shipping is not possible'.

'Many people I know, including family and friends, work in the coffee industry. Coffee is an important industry and we must continue to take care of it so that it does not run out'.

Managers' comments:
'Everyone is trying to fulfil their duties seriously. I would like to believe that we will not deviate from the rules. But the auditors have their limits. We can't go deep into the forest, we don't have enough time or people. Who would go deep into the forest and do something so dangerous?'

'....we don't have enough manpower'.

'We want our efforts to be recognised. There is too much paperwork.'

Thus, farmers have a certain understanding of coffee certification schemes and the difficulties of maintaining them, but they are not concerned much about how coffee products are perceived and how certification schemes are performing in terms of how consumers prefer and purchase coffee products in the consuming regions. On the other hand, in the awareness of the managers, there are prominent references to the difficulties of procedures and document preparation for the maintenance of coffee plantations, as

well as a pride in seriously acquiring and maintaining certification schemes and making their efforts in management quality control known.

4.2.2. Second group of interviews (Importers & distributers and consumers in Japan)

The second group of interviews (importers and distributors and Japanese coffee consumers) were conducted and Figure 5 visualises the extent of speech for each of the common Nodes obtained as a result of text mining of the interview data.

The Nodes developed for the analysis were:

1. Certification
2. Coffee quality
3. Coffee making process
4. Economic implementation
5. Traceability
6. Brand

Of the second group, importers (above) are fully aware of the certification system and mention that the certification system constitutes a brand value. While there is also an expression of the intention to contribute to the economic development of the producing country, the quality of the coffee is not mentioned in passing. In contrast, consumers (below) made frequent references to the quality of the coffee and generally gave high marks to the depth of flavour and aroma. On the other hand, there were also many positive evaluations of the brand value induced by the certification system. Both groups, on the other hand, made relatively few references to the traceability of the origin of the coffee.
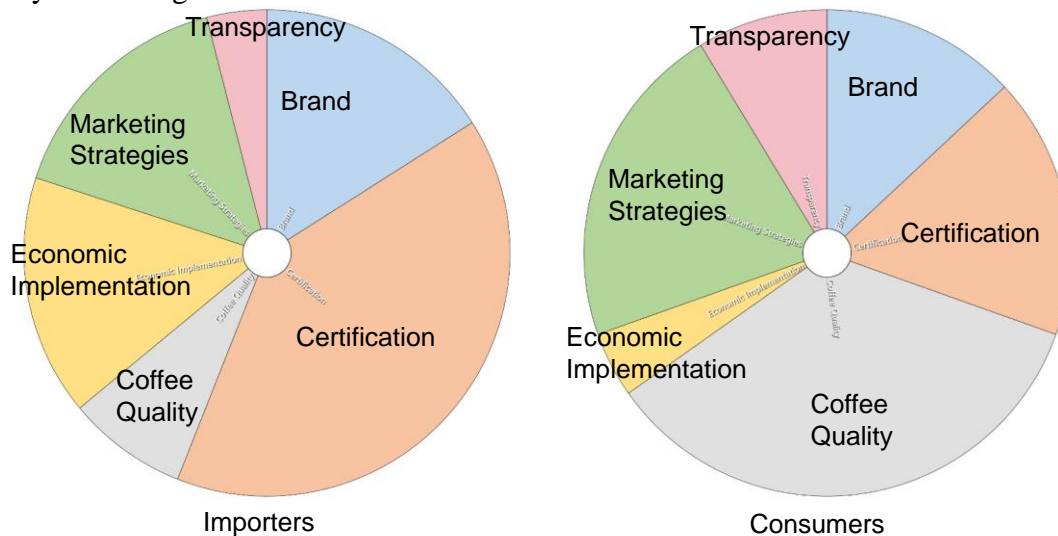
Figure 5. Key themes (nodes) discussed from two sub-groups (Importers & consumers)

Mining techniques were then used to examine the tendency of both groups to speak from the same text data. Figure 6 compares and arranges the most common words in the statements of Japanese coffee importers and consumers. From this figure, it is possible to identify the main trends in the statements of both sub-groups. This trend parallels the characteristic trends identified in Figure 5, which compares the five nodes, but provides us with more detailed characteristic terms.

While importers of Ethiopian coffee are developing marketing strategies with the aim of contributing to the producing countries through the certification system and to provide economic support, consumers are, first and foremost, expressing their admiration and appreciation of Ethiopian coffee, which is exotic and delicious. Importers also hope that by promoting Ethiopia as a coffee country of origin and its story, they will be able to promote their sales more. Consumers are more interested in sales strategies that put a face to the farmers and farmers in the origin country, and seem to enjoy as such virtual trip to distant coffee origin countries

Figure 6. Comparative analysis of frequently mentioned words from both interviewee sub-groups

Figure 7 shows a table in which the words appearing in the two documents are grouped according to which of the two documents they occur in, in order to confirm the results of the text mining analyses. The words in the groups are arranged in order of their frequency of occurrence and the results of the qualitative assessment allow us to understand the differences in the perceptions of the two sub-groups of Japanese stakeholders.

Importers	noun	Consumers
50	coffee	50
92	forest	8
88	certification	12
100	scheme	0
0	bean	100
88	people	12
60	shop	40
81	consumer	19
81	country	19
100	behaviour	0
100	consumption	0
100	distributor	0
100	effect	0
100	reputation	0
100	story	0

Importers	verb	Consumers
100	develop	0
0	produce	100
0	see	100
100	live	0
100	think	0
0	classify	100
0	give	100
0	hear	100
0	sell	100
45	make	55
23	know	77
100	promote	0
100	purchase	0
100	study	0
78	certify	22

Importers	adjective	Consumers
100	economic	0
0	single	100
20	ethiopian	80
85	premium	15
100	environmental	0
0	famous	100
0	fruity	100
100	many	0
0	popular	100
0	retro	100
100	specific	0
100	wild	0
60	familiar	40
33	high	67
0	big	100

Figure 7. Comparison of the tendency of words to appear in two groups' interviews

Characteristic statements from the second group of interview data are summarised below.

Importers' comments:

'Certification marks have become widespread among consumers. However, not many of them understand what the logo of the tree frog means'.

'...However, there are a certain number of snob consumers who are willing to pay a premium price for products with fair trade and certification marks'.

'The popularity of coffee has been growing in Japan over the past few years, but marketing efforts need to be made, such as showing videos in shops of forests where the native coffee tree species grows and organising tasting events to underpin the fanbase'.

'The forest conservation effects of certification schemes, consumer purchasing behaviour and the difficulties of micro-coffee importers are things to know as a distributor'.

Consumers' comments:

'The certification mark is often seen, but as a consumer, it might be more commonly referred to as speciality coffee'.

'...the term single-origin coffee is also very attractive. In coffee, you may often hear coffee classified by country of production, such as 'Brazilian' or 'Colombian', but single origin coffee is a coffee that is further classified as a single brand by farm, producer, variety, refining method and other units'.

'Being able to see the face of the producer gives peace of mind. In the vegetable section of supermarkets, you see the phrase 'vegetables produced by Mr 00'. It is similar to such a system'.

'This gives a sense of connection with the producer. It is also connected to the evaluation of the producer, which leads to the value of the coffee from that farm'.

Thus, there are distinctive characteristics in the awareness of the coffee certification system and Ethiopian coffee among the two sub-groups of consumers and importers/distributors in Japan, the largest consumer of Ethiopian coffee. Importers understand the meaning and role of coffee certification schemes and the contribution they can make, including economic benefits, to farmers and communities in coffee-producing regions by selling products with certification schemes. They also recognise that from the perspective of the entire supply chain, they are an important stakeholder embedded in the network.

Consumers, on the other hand, enjoy and appreciate the quality of Ethiopian coffee and the attributes of the product, which, in addition to the exotic brand value, are visible in the face of the production area. This awareness among consumers suggests that the face-to-face nature of the coffee farmer's story is a good strategy for appealing to consumers in other countries, the final retail destination of the B2C network. This suggests that it is a marketing material.

4.3.3. Third group of interviews (Experts and consultants in the field of agri-food businesses)

The third interview group consisted of six experts on certification schemes for agricultural products and agri-food businesses in developing countries. The interviews were conducted by remote method and Figure 8 visualises the range of utterances per common Node obtained as a result of text mining of the interview data.

The Nodes developed for the analysis are as follows:

1. authentication
2. coffee quality
3. economic viability
4. marketing strategy
5. SDG
6. transparency
7. women's employment opportunities and empowerment
8. brand

Each of the interviewees in the third group responded positively to the effectiveness and functioning of the certification system and its prospects, but a distinctive trend was to discuss the contribution to SDG and the creation of employment opportunities and improved working conditions for women and empowerment. It can be seen that the contribution to women (Goal 5), together with the expressed intention to contribute to the economic development of the producer countries (Goal 8), is expected to be a benefit of the certification system. Furthermore, as a characteristic element, we can also read the expectation that the coffee certification system will have the effect of ensuring transparency in the coffee trade, which in turn will contribute to the establishment of a global coffee value chain (Figure 8).

Figure 9 shows the word co-occurrence map with word cloud developed from text data collected from experts of certifications in agri-food businesses. In line with it, two-dimensional word map is used to give an overview of the tendency of words to appear in a sentence (Ding,

2021), meaning that words that are close together tend to appear in the same place (words with a similar tendency to appear are placed closer together, words that are not similar are placed further apart). A method called t-SNE was used to determine the position in the 2D coordinate system (Hajibabaee et al., 2021). The XY axis in the graph itself has been assigned, as the 2D map can show the relative distance between words. All it shows is that words near each other have a similar tendency to occur, while words further away do not have a similar tendency to occur. Words with the same colour belong to a close group (Figure 10).
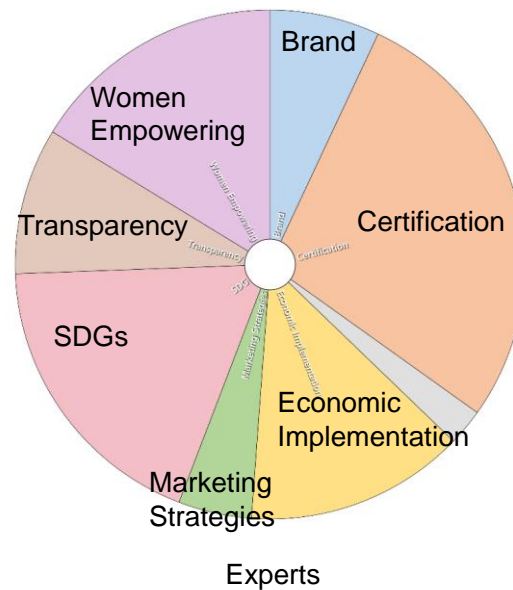
Figure 8. Key themes (nodes) discussed from the experts' group
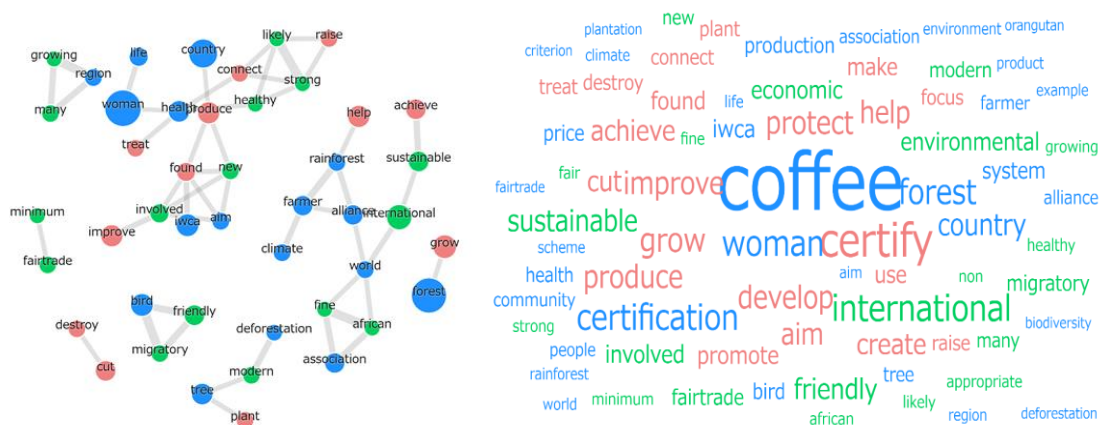

Figure 9 Co-occurrence map of words with word cloud

The co-occurrence maps and word clouds obtained in Figure 9 show that terms related to women's empowerment often form clusters with terms related to community resilience and healthy development, in line with the appearance of the key themes (nodes) shown by Figure 8. Figure 10 shows that the findings and implications for contributing to the development of sustainable agri-

food businesses are not limited to the implementation of certification schemes in agro-producing countries. In particular, the findings uniformly suggest a contribution to value chain development that encompasses stakeholders throughout the supply chain, contributing to improved working conditions for women in production and to the health and welfare of consumers.

There was also a suggestion that the concept of fair trade should be more widespread to ensure ethical consumer choice behaviour and ethically responsible production processes globally. The following are representative characteristics and thought-provoking statements from the interviewees.
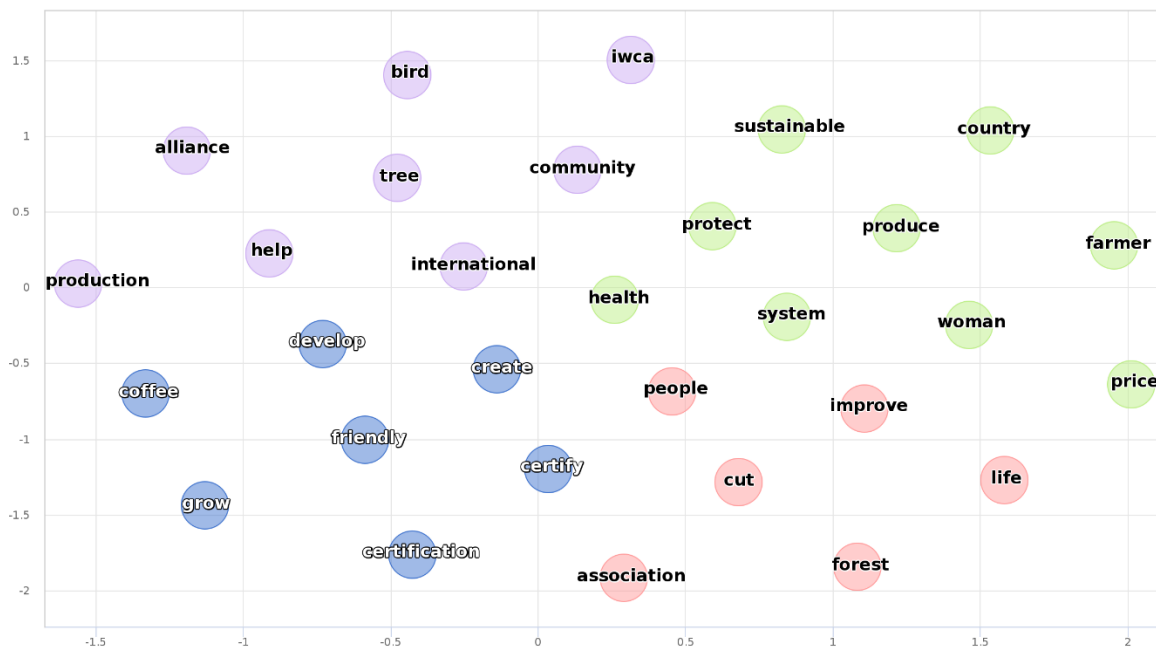

Figure 10. Two-dimensional map

Characteristic statements from the third group of interview data are summarised below.

'The SDGs include goals to achieve gender-free, gender-equal, healthy, diverse, prosperous and participatory societies, and certification schemes established with the aim of contributing to necessary public health and essential health policies are helping to solve socio-economic challenges'.

'In many cases, initiatives originating from companies have spread globally and contributed to the value chain of agricultural products in developing countries'.

'It is important to enable women to achieve meaningful and sustainable livelihoods in the international coffee community and to encourage and recognise their participation in all aspects of the coffee industry'.

'Fair trade is an initiative to achieve a sustainable world by making the trading system fairer and more equitable, so that small-scale producers and workers, especially in developing countries, can lift themselves out of poverty and protect their local communities and environment. Certification schemes have the power to act as a catalyst for this'.

'Improving and monitoring working conditions in coffee-growing areas is an important issue, not only for women, but it would be useful to consider continuous checks and support from a global network'.

4.3. Discussion

The three groups of interviewees made statements about the certification system and the sustainable value of Ethiopian coffee from their own perspective, but different aspects were highlighted by the triangulation and the first & second group of subclusters. The results of the text mining, as described above, were visualised and key themes were compared and discussed.

Local farmers and managers, who make up the first group, were more interested in economic value creation and employment opportunities than in the medium- and long-term impact of certification schemes and the position of coffee-producing areas in the supply chain, and developed an understanding of certification schemes from a holistic perspective and, as the literature review suggested, the relationship in the production area Stakeholder collaboration is required to raise awareness of the issues involved and to identify issues for the development of sustainable supply chains.

On the other hand, the interviews with the second group, consisting of traders and buyers in the largest import markets for Ethiopian coffee, showed a clear understanding of the medium- and long-term economic benefits of the certification system in the awareness of importers, and a high appreciation of the appealing effect of coffee from brands that have acquired certification. Consumers, on the other hand, are aware of the existence of certification schemes and clearly state that they understand and are willing to pay a premium for certification. However, the high appreciation and awareness of the quality, aroma and flavour of exotic coffee, rather than the network spillover effects of certification schemes, clearly suggests that a marketing strategy should be based on the producer's visible landscape and production process.

From a comprehensive perspective, the interviews conducted with a third group of experts in certification schemes and support policies for agro-industry in developing countries revealed more clearly the paradoxes of certification schemes. Namely, the view was obtained that the benefits of certification schemes currently revert more to the consumers in developed countries than to farmers in the production areas. As a challenge for the future, expectations for socio-economic benefits, including improved working conditions for farmers and community stakeholders in the production areas, especially for women, were also mentioned. In other words, certification schemes, whose main focus is on forest conservation and contribution to a balanced environmental policy, are further expected to improve the decentwork environment (Goal 8), ethically promoting desirable production (Goal 12), improving women's working conditions (Goal 5), which is the combined SDGs, was presented as a prospect for achieving the SDGs.

The results of the triangulation qualitative analysis applied to the three groups of interviews also suggest the potential to link certification schemes to supply chain resilience and sustainability. However, there is undoubtedly an urgent need to develop mechanisms and consensus building for this purpose. Therefore, it appears necessary to quantify and track the effects of the certification schemes and examine their linkages to economic and social outcomes in detail in order to provide policy implications for achieving the optimum balance between environmental conservation and economic outcomes in production areas that the introduction of certification schemes can bring about.

5. CONCLUSION
5.1. Theoretical contribution

Given the paucity of assessment studies based on qualitative stakeholder data that focus on aspects of coffee certification schemes that contribute to the establishment of a resilient and sustainable global coffee supply chain, the qualitative analysis results and implications extracted from the primary data obtained in this study are useful for future research and discussion.

Although agricultural certification schemes have been introduced around the world, research to date has mainly focused on the outcomes of single aspects of certification (e.g. ecological or economic) in the short term, with little multidimensional and adequate attention given to stakeholder perceptions and the long-term outcomes of certification schemes.

The main contribution of this study is not limited to the Focus of the main objective of coffee certification schemes, which is to contribute to forest conservation. The study also recommended that research on certification schemes should be multifaceted and comprehensive, using interdisciplinary knowledge to delve into the awareness and evaluation phases of stakeholders involved in certification schemes, and to reflect this in the extraction of suggestions.

5.2. Practical contributions

This study aims to qualitatively examine the impact, challenges and future prospects of coffee certification schemes on the sustainability of the coffee supply chain. Through qualitative in-depth interviews with key stakeholders and data mining, the following practical results were derived

1. the potential and significance of certification schemes needs to be recognised in depth, and a network perspective needs to be developed to bring value transmission from the production area through the supply chain to the global market. To this end, information should be shared and awareness raised with a wide range of stakeholders, including local farmers, plantation managers, traders in importing countries, consumers, support groups and experts.

2. with a view to stimulating collaboration among stakeholders in the global coffee supply chain, we would like to propose comprehensive information dissemination and learning opportunities linked to other certification schemes. In other words, it is suggested that the scheme should encompass SDG 5, 9, 12 and other targets, build consensus among relevant stakeholders and implement the scheme.

3. as suggested in the third round of interviews with experts, it is important to focus on the actual conditions in coffee-growing areas that are difficult to see, such as improving the working environment for women in coffee-growing areas, and to identify issues that need to be resolved. The aim should be to establish a balanced coffee value chain in collaboration with public authorities and international aid organisations.

5.3. Limitations and further research opportunities

Although there is a certain body of research on the relationship between coffee certification schemes and coffee forest conservation and environmental protection, this study attempted to conduct a qualitative evaluation and make recommendations using ethnographic methods. The implications from this study, which could have a significant and immediate impact on farmers' perceptions and behaviour, and thus on the effectiveness and sustainability of certification schemes, call for a clear vision for the design and implementation of certification schemes under public authorities and international initiatives, while avoiding unnecessary confusion among the parties involved.

In order to consolidate the research findings obtained and elevate them to the level of concrete recommendations, it is important to propose policy guidelines in line with the SDG targets through large-scale verification and research, taking into account certification programmes in different socio-economic and ecological contexts. Future research projects are being planned to analyse the complexities of relevant ecological and socio-economic factors so that practitioners can establish more adaptive conservation management practices.

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