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Assessing Consumer Interest in Sustainable and Ethically Certified Tropical Fruits in the Central and Eastern European Region

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Abstract: Tropical fruit consumption has increased globally, with 95% of production in low- and middle-income countries, often with a questionable social and environmental impact. This study explores the potential of sustainable tropical fruit consumption in Central and Eastern Europe. The researchers surveyed 2266 Czech respondents on their attitudes toward tropical fruits and the role of ethical certification in their purchasing decisions. Using a structural equation model (SEM), the study identified the factors influencing consumers' decisions to buy Fairtrade fruit, focusing on awareness of related global issues, including their environmental and economic impacts. The findings indicate that despite the increasing supply and consumer awareness of tropical fruits in the Czech market, most respondents preferred traditional tropical fruits like bananas (99%), pineapples (94%), mangoes (78%), and avocados (65%). The study found that 42% of respondents were familiar with Fairtrade and that 55% intended to buy it, but that consumers often purchased it unintentionally due to retailers' marketing strategies. The results of the SEM showed that consumers' ethical shopping preferences and environmental awareness significantly contributed to Fairtrade purchasing behaviour, whereas economic and global challenges did not have a substantial impact. Therefore, for the long-term sustainability of the ethical tropical fruit sector, greater consumer education on the social and economic aspects of ethical products is needed.

Keywords: consumer behaviour; Fairtrade engagement; labelling; social responsibility; tropical fruit consumption

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1. Introduction

1.1. Background of Tropical Fruit Production

Fruit crops constitute a major part of agricultural production and are an irreplaceable component of a healthy human diet. Even though they generally do not provide much energy, their importance lies in their micronutrient content, especially vitamins and minerals. It is already well known that regular consumption of fruit (together with vegetables) reduces the risk of noncommunicable diseases (NCDs), such as Parkinson's disease, autoimmune diseases, stroke, most heart diseases, cancers, and diabetes [1,2]. Thus, the World Health Organization (WHO) recommends eating at least five portions of fruit and vegetables per day (at least 400 g per day) as a population-wide intake goal for the prevention of NCDs, as well as for the prevention and alleviation of several micronutrient deficiencies [3]. However, many countries are still below this minimum limit, which may be caused by various social, economic, and cultural factors [4].

Owing to increasing possibilities in transportation, open markets, the establishment of various trade agreements, and shifting consumer preferences, tropical fruits have been a significant part of international trade since 1970. It is estimated that more than 95% of

tropical fruit production occurs in low- and middle-income countries, where it plays a significant role in generating income and employment and is a source of nutrition for the population [5]. The major tropical fruits are responsible for approximately one quarter of global fresh fruit production, which is constantly increasing and has more than doubled in the past 30 years, from 401 million tonnes in 1990 to 933 million tonnes in 2022 [6,7]. In terms of production quantities, the five major tropical fruits in 2022 were bananas (excluding plantains), mangoes (including mangosteens and guavas), pineapples, papayas, and avocados, with a total world production of 246 million tonnes [6,7]. The production of these five commodities increased at an average compound rate of 2.3% per year from 2009 to 2018, and is projected to grow at 1.8% per year between 2019 and 2028. More than half of this production originated in Asia, while approximately 25% was from Latin America and 15% from Africa [6]. Currently, there are more than 50 species of tropical fruits on the international market, which is twice as many as there were in the year 2000. According to the Observatory of Economic Complexity [8], the largest importers of exotic fruits are traditionally the United States of America (USA) and the European Union (EU), especially Belgium, the Netherlands, Germany, and France, whereas among the top exporters are Mexico, Costa Rica, the Netherlands (due to the transit trade), and Peru. Currently, not only are traditional tropical fruits (e.g., bananas, avocados, mangoes, and pineapples) widely available in markets, but other tropical fruits, such as the cherimoya and pitahaya, are becoming more accessible to European consumers as well.

While tropical fruit production provides incomes and jobs for hundreds of thousands of farmers and other workers and dramatically contributes to food and nutrition security, this sector faces significant environmental and social sustainability issues [9]. Monoculture cultivation provides benefits such as simplified management and increased yields; however, recent studies increasingly emphasize its negative environmental impacts. Monoculture plantation production can harm entire ecosystems, primarily because of the enormous amounts of water needed for irrigation, increasing soil vulnerability to erosion, or the application of synthetic agrochemicals (fertilisers, insecticides, etc.) [10]. The banana industry, for example, consumes more agrochemicals than any other crop in the world except cotton [11]. Moreover, postharvest operations such as the packaging and distribution of fruit require fossil fuel energy, which contributes significantly to climate change [12].

The increasing use of conventional methods, which rely heavily on the use of agrochemicals, has also brought some problems in terms of human health. According to the International Labor Organization (ILO), agriculture is one of the most hazardous sectors in the world. In particular, one-in-three fatal occupational injuries worldwide occur among agricultural workers [13]. Although the specific risks vary depending on the crop or sector, the typical problems include exposure to toxic agrochemicals, the risks associated with physically demanding work, being endangered by extreme weather, carrying heavy loads, repetitive motions, the use of dangerous tools and equipment, animal attacks, and working at heights [14]. A significant number of workers lack access to potable water, breaks, or shade. Consequently, heatstroke remains a leading cause of mortality among farmworkers. Moreover, forced child labour is still present in many fruit plantations [13,15]. Workers in fruit production also experience significant chemical and pesticide exposure, particularly when they are not provided with appropriate protective equipment. Additionally, local inhabitants and consumers are at high risk because of the agrochemical residues present in the fruit and water [14].

Currently, the avocado is probably the most controversial fruit. Mexico is the world's top grower and fruit exporter, and the USA is by far its largest customer (consumption per capita has increased by 440% in the last 20 years). While the booming production of avocados (often referred to as Mexico's "green gold") has contributed to the country's economic growth, it has also caused deforestation and environmental degradation in central and southern Mexican forests [16]. Although it is often illegal, farmers sometimes clear trees to make way for avocado plantations, either because of a lack of available farmland or the lower cost of clearing land. Additionally, Mexican drug cartels have entered the

lucrative avocado industry to diversify their portfolios beyond illegal activities. Initially, many avocado growers welcomed the cartels for the services they provided, such as security for their land and products, which the state had failed to deliver. However, the cartels began demanding extortionate taxes and became increasingly predatory. Today, they engage in extortion, kidnapping, and torture, and frequently murder avocado producers, transporters, and packers to exert control over the sector [17,18]. Another critical problem is that avocados have a high demand for water and cannot typically be grown commercially without supplementary irrigation. For avocados, the world's average green water footprint (rainwater) is 849 m^3 t^{-1}, and the blue water footprint (irrigation water) is 237 m^3 t^{-1} (1996–2005). Thus, water resources where avocados are grown are increasingly overexploited in many parts of the world, with direct negative consequences for food production and humankind [19].

Similarly, banana cultivation has traditionally been associated with many negative effects, especially on large-scale plantations. Globally, bananas are the fourth most important crop in the food market, next to rice, wheat, and maize. Moreover, bananas are the leading fruit crop in terms of volume and value in the world fruit market [20]. In addition to their environmental issues (monoculturing and the vast amounts of agrochemicals applied), they are infamous because of social and power-related concerns. Reports about problems in the banana industry often highlight the incredibly challenging situation for workers: low wages, precarious employment, restrictions on the right to organise into groups, and the handling of unhealthy and environmentally hazardous chemicals without adequate protection [21]. This situation is usually much better for small-scale farms. However, these are affected mainly by the unsustainably low prices paid by fruit companies, especially supermarkets, which are now the most powerful actors in the banana supply chain. On average, workers earn only between 5 and 9% of the total value of the bananas produced, whereas retailers can retain approximately 40% or more of the price that consumers pay [22,23].

1.2. Global and EU Priorities for Sustainable and Inclusive Global Value Chains

Many governments worldwide recognise agricultural enterprises and their value chains as significant sources of growth and development. They also play a crucial role in fulfilling sustainable development goals (SDGs) and creating quality investments and decent employment. Currently, the global challenges related to agricultural and food systems—including regarding the environment, climate, biodiversity, poverty and social justice—are widely discussed and emphasised in global and national policy documents related to the production and trade of agricultural commodities [24]. Ideally, global supply chains should benefit both producers and consumers. One of the key documents is the Guidance for Responsible Agricultural Supply Chain prepared by the OECD and FAO [25], which provides a step-by-step approach for companies to embed due diligence into their operations and supply chains. In addition, the Business Handbook on Deforestation and Due Diligence in Agricultural Supply Chains was created to underline the mandatory obligations of due diligence in global supply chains and to address deforestation concerns [26]. The UNDP Green Commodities Program announced in 2010 that it aims to support the achievement of the SDGs by improving the lives of farmers and their communities, as well as through forest protection and conservation. As part of this programme, cross-cutting issues aimed at strengthening the cooperation of stakeholders towards a shared vision and collective action are supported, promoting gender balance, transparency, accountability, and good governance [27].

In 2023, the European Commission (EC) adopted the Directive on Corporate Sustainability Due Diligence, which aims to enhance the protection of the environment and human rights, as well as promote responsible behaviour in companies, within global value chains [28]. Human rights priorities include forced labour, child labour, inadequate workplace health and safety, worker exploitation, and the primary environmental impact targets are focused on greenhouse gas emissions, pollution, biodiversity loss, and ecosystem degradation. In addition, a recent strategic initiative of the EC is the European Green

Deal—the strategy for an EU economy that is sustainable, cleaner, safer, and healthier [29]. In particular, one key priority includes reducing net greenhouse gas emissions by at least 55% by 2030. Furthermore, according to the EU Deforestation Regulation, only products that are legal in the country of production and not associated with deforestation and forest degradation can currently be marketed in the EU [30]. Another relevant approach is the Farm to Fork (F2F) strategy, a comprehensive 10-year strategy addressing the challenges of producing and consuming food fairly and sustainably [31].

1.3. Research Objectives

The EC Corporate Sustainability Due Diligence Directive introduces to EU countries obligations for large companies to ensure compliance with human rights and environmental sustainability criteria within their activities and supply chains. However, implementing and integrating due diligence processes into corporate strategies can be complex, and requires the willingness and positive response of consumers. Therefore, our research aims to identify practical solutions for effectively navigating these challenges from the perspective of the Czech Republic as a representative of the specific region of the Central and Eastern Europe (CEE).

This comprehensive study evaluates the potential for strengthening the sustainability of tropical fruit consumption in the CEE region from the perspective of final consumers. It asks the main research question of how consumers can contribute to the sustainable production of tropical fruit through their daily purchasing behaviours. The paper contains two interconnected studies with the following research objectives: 1. evaluate the general attitudes towards the consumption of tropical fruits in the Czech Republic; 2. analyse the attitudes of consumers towards ethical certifications; and 3. explore the interplay of factors motivating the consumption of Fairtrade fruit. The methods and results are structured around these three main objectives, while the discussion and conclusions integrate our findings.

For the third objective, the hypotheses that we tested in our research can be summarized as follows:

H1. *Interest of consumers in global issues is positively associated with the consumption of Fairtrade products.*

H2. *Interest of consumers in the product specification is positively associated with the consumption of Fairtrade products.*

H3. *Awareness of consumers about environmental topics is positively associated with the consumption of Fairtrade products.*

H4. *Interest of consumers in the economic impact of consumption is positively associated with the consumption of Fairtrade products.*

H5. *Interest of consumers in the ethical and social impacts of consumption is positively associated with the consumption of Fairtrade products.*

1.4. Literature Review

1.4.1. Consumer Preferences for Tropical Fruits in Europe

The consumption of tropical fruits has increased worldwide over many years. Especially in Europe, including the Czech Republic, consumers' interest in tropical fruits has increased significantly during recent decades. The reasons may be better knowledge of these fruits (globalisation phenomenon, with more travel possibilities and experiences), greater representation of ethnic minorities, and greater demand for healthier foods and food products [32]. The consumption of tropical fruits and the actual decision of the consumer are a result of various interactions between different factors. Researchers have confirmed

that both intrinsic and extrinsic food quality characteristics are essential for understanding consumer behaviour and preferences [33]. Intrinsic characteristics provide the foundation for the sensory and nutritional qualities of food (e.g., sensory attributes, nutritional content, and physical properties), whereas extrinsic characteristics shape the overall consumer experience, influence purchasing decisions, and are associated with branding and labelling (e.g., packaging, price, country of origin, and certification) [34,35].

From the point of view of intrinsic factors, fruit quality attributes and health-promoting properties are essential factors affecting consumers' willingness to buy tropical fruits. This preference is highly variable from consumer to consumer, and it is based on a combination of objective characteristics (e.g., fruit colour, texture, freshness, size, nutrition) and subjective processes (based on the consumer's perception of the product) [32,36]. The quality of the fruit is also affected by processes during the whole supply chain, such as harvesting, storage, distribution, and packaging. For imported tropical fruits, the disadvantage may be that the taste can be affected by an early harvest. Tropical fruits intended for export are often harvested before they are fully ripe, when the fruit is firm and can be better transported over long distances. These fruits must be artificially ripened before consumption. They are often less sweet and more sour and have more undesirable flavours than those harvested at the fully ripe stage. Currently, exceptionally high-quality fresh tropical fruits marked as "ready-to-eat" fruits, which are perfectly ripe and possess maximum flavour and health benefits, can be purchased. However, they are often more expensive because of the higher costs of transportation [37].

Extrinsic factors closely associated with fruit consumption encompass product familiarity, which is identified as the primary determinant of tropical fruit purchase intention, and prior experience. It was also confirmed that people used to travelling abroad are more willing to try new products, including tropical fruits [38]. In addition, tropical fruits are often not only consumed but also used as decorations for festive occasions, such as weddings, celebrations, and Christmas. Another significant factor influencing fruit consumption is the price of the products, which varies in response to changes in supply and demand. For example, the price of avocados varies due to seasonality and different varieties, which are characterised by different sizes and quality levels [5]. High pricing (especially in the case of organic fruit) is often mentioned as a barrier to fruit consumption. In contrast, lower prices in the fruit season are frequently a solid motivation to purchase fruit more often. The primary factors influencing consumers' decisions to purchase exotic fruits are sociodemographic characteristics, particularly age, gender, education, income, and residence. For example, previous research has demonstrated that women, who are generally more knowledgeable about healthy diets, tend to place greater importance on fruit consumption [32,38,39].

1.4.2. Tropical Fruit Consumption in the Czech Republic

In the Czech Republic (formerly Czechoslovakia), the fruit market was somewhat limited before 1989. The situation changed after the Velvet Revolution in November 1989, when import volumes increased and trade opened to new countries [40]. According to the Ministry of Agriculture of the Czech Republic, the consumption of fresh fruits in the country has consistently increased from 59.7 kg/person/year in 1990 to a maximum of 90.4 kg/person/year in 2009, then slightly decreased, and subsequently increased between 2010 and 2021, ranging from 74.6 to 90.6 kg/person/year [41–43]. The latest available data indicated 88.5 kg/person/year in 2022 [41–43].

The consumption of exotic fruits (so-called "southern fruits", including tropical fruits, subtropical fruit species, and citrus) has more than doubled since 1990, from 14.9 kg/person/year to 38.5 kg/person/year in 2022. "Southern fruits" represented approximately 25% of the total fresh fruit consumed in 1990. However, in 2022, this number reached 43.5%. Citrus and bananas are traditionally the most popular exotic fruits among Czech consumers, with total consumption rates in 2021 of 18.5 and 13.1 kg/person, respectively [41–43]. These two commodities account for almost 80% of the total consumed

"southern fruits". Others include grapes, pineapples, and kiwi fruits [41–43]. Moreover, many previously unknown species to Czech consumers, such as avocados, mangoes, persimmons, lychees, pitahaya, or passion fruit, have become available during the last 20 years in supermarkets, specialised fruit stores, and various food shops and supply chain networks operated by the country's Vietnamese minority. However, the statistical data for their consumption are not available. Recently, consumption and international sales have been strongly influenced by the COVID-19 pandemic. During this period, the consumption of fruit and juices increased significantly in many European countries, including the Czech Republic [44].

1.4.3. Private Ethical Certifications for Tropical Fruits

Ethical consumption is recognised as intended consumption that considers personal and moral beliefs concerning health, society, and the environment [45]. It includes a range of approaches, from international and state-controlled to private business initiatives. The existing private initiatives can be grouped on the basis of their level of independence from the involved business entities into first-, second-, third-, and fourth-party approaches [46]. Food safety-based, accredited, and recognised standards, defined auditor criteria, and private third-party certifications are key aspects that could strengthen the transparency of international fruit supply chains [47]. Product labels serve as a valuable means of conveying ethical details to consumers. Particularly in the food sector, companies rely on labels extensively to educate consumers about product attributes and encourage sustainable choices [48]. EU priorities, such as the European Green Deal and Farm to Fork Strategy, also encourage independent labelling to meet consumers' information needs about healthy and sustainable food.

The Fairtrade business model is one of the most successful and influential solutions to the problems of unsustainable production in the global South and global trade. It is a private third-party certification system that provides guarantees to consumers that the products bearing the certification label are produced and traded under strict conditions. Fairtrade is defined as "a trading partnership, based on dialogue, transparency and respect that seeks greater equity in international trade. It is an institutionalised form of good business practices that contributes to sustainable development by offering better trading conditions to, and securing the rights of, marginalised producers and workers, especially in the South" [49]. The Fairtrade business model includes fair prices, a regular and fair income for producers, humane working conditions, and ecological methods of production, which imply the rational use of water, integrated pest management, and the banning of genetically modified products. Bananas and other tropical fruits carrying the Fairtrade label have been produced by small farmer organisations or plantations that meet the Fairtrade social, economic, and environmental standards of protecting plantation workers' rights and the environment and paying the Fairtrade minimum price.

It is widely recognised that Fairtrade contributes to the fight against poverty, economic crisis, and climate change, as well as social aspects such as empowering women, engaging in democratic decision-making, and reducing child labour [50–52]. In addition, many Fairtrade-certified foods are certified as organic, which can increase their appeal to health-conscious consumers while positively impacting the environment [51]. The UN, OECD, and EU Parliament have endorsed the Fairtrade system. The consumption of Fairtrade products thus represents a form of ethical consumption, and purchasing Fairtrade products can be a consumer strategy that addresses global concerns related to social justice, equality, and sustainable development. Currently, it has inspired many similar third-party certifications and initiatives with various standards, means of verification, and logos for consumers, which adds complexity and causes confusion among customers.

As of 2017, when the last market overview was conducted by Fairtrade International, Fairtrade global sales surpassed EUR 8 billion [53]. Over 1.7 million farmers and workers actively participated in Fairtrade. The latest figures show that in 2022, 1,484,649 metric tonnes of certified Fairtrade bananas and 636,527 metric tonnes of other fresh fruits were

produced. Today, the global demand for Fairtrade-sourced fruits continues to grow [54]. The trend of increasing ethical consumption is also evident in the Czech Republic [55]. The nonprofit organisation Fairtrade Czech Republic and Slovakia is the national representative of Fairtrade International in the Czech Republic. It administers licence fees for using the Fairtrade label, increases awareness of Fairtrade principles and strengthens customer confidence. The first sales of Fairtrade products in the Czech Republic date back to 1994, and since then, they have become part of regular retail chains such as Tesco, Lidl, Globus, and Kaufland, as well as smaller retailers with healthy and upmarket products. Nevertheless, it was only in 2020 that two globally important fresh Fairtrade commodities appeared on the Czech market—bananas and flowers—which were previously sold only sporadically in the country. Fairtrade cut flowers sold 4,271,170 stems, a 32% year-on-year increase in 2022. The Lidl chain holds the largest share of this volume, followed by sales in Kaufland [56]. The leading retailers of Fairtrade bananas are Lidl and Kaufland, both of which are part of the German Schwarz Gruppe.

Overall, 1768 tons of Fairtrade-certified bananas were sold on the market in 2023, representing an increase of 144% from the previous year. Fairtrade Czech Republic and Slovakia actively supports the sale of bananas by campaigning, raising awareness, and forming direct business contacts with representatives of traders and retailers [56]. In addition to Lidl and Kaufland, the smaller alternative health- and lifestyle-focused retailer Country Life offers Fairtrade bananas from a different supply chain. There are also Fairtrade mangos on the Czech market. However, they are supplied sporadically at times of surplus from neighbouring Germany and Austria. With respect to awareness of the Fairtrade label, according to a recent survey by the Median company for Fairtrade Czech Republic and Slovakia, 67% of Czech consumers know of it, and 36% of respondents said they know exactly what this mark means [56]. The survey found awareness of this designation in 18% of the respondents. It was the second most frequently mentioned label informing about the origin of the goods or guaranteeing the fulfilment of certain conditions during production (higher knowledge was recorded by the label KLASA (certification of national origin and quality controlled and supported by the Ministry of Agriculture), and bio (organic) was in third place). The question mapping the awareness of labels and certificates aimed at improving working conditions in developing countries also confirmed the dominant position of the Fairtrade brand in this segment. It was answered by almost a third of the respondents (34%).

1.4.4. Attitudes of Consumers Towards Social Responsibility and Sustainable Production

The demand for sustainable food products that meet the requirements for a healthy environment, economic profitability, and social and economic equity is stimulated not only by the factors mentioned above, such as international and EU strategic documents, national regulations, and private initiatives, but also from the perspective of the final customers [33,55]. Currently, food is required to be safe, tasty, naturally ripened, healthy, nutritious, acceptable, and affordable for consumers while guaranteeing fair profits for farmers, workers, and retailers by, for example, using Fairtrade or alternative labels. A meta-analysis of 80 global studies revealed that consumers were willing to pay price premiums for sustainable food products, mostly in the fruit and vegetable category, and for products of organic origin [57]. As Zadek identified in 1994 [58], there are four typical "lenses" through which the need for ethical consumption can be interpreted: 1. economic utilitarianism, where consumers derive individual economic utility that balances personal morality with economic factors; 2. social psychology, where consumers buy such products to self-construct their identity within a social group; 3. reciprocal ethics, where consumers engage actively in trade in an attempt to establish bonds between communities in the modern supply chain; and 4. transcendent ethics, related to pursuing the spiritual and humanist tradition of altruism and the negation of ego.

The popularity of sustainable food products is constantly growing, and consumers can choose from a wide range of ethical approaches (e.g., local products, animal welfare

products, Fairtrade, organic, and zero waste). In recent years, the role of ethically labelled products, which consider issues of the environment and human well-being, has also been growing [59]. These include already well-established certifications such as Fairtrade or Rainforest Alliance. Fairtrade certification is known to enhance product valuations and the relationship between Fairtrade and the willingness to pay for the brand [33]. For example, a study by Naegele [60] confirmed that consumers are willing to pay a higher price (by USD 1.5) for Fairtrade-certified coffee than for nonlabelled coffee. According to information from the Fairtrade Foundation in the UK, fresh products have experienced significant growth in the retail space in recent years, particularly for bananas and new product lines, including Fairtrade-certified grapes, tomatoes, and oranges. Another study reported that consumers were willing to pay a 31% price premium for apples when they learned that the apples were from poorer areas [61].

When discussing Fairtrade consumption in the context of individualistic and collectivistic cultures, it is important to highlight the distinct motivations and values that drive consumer behaviour in each cultural framework. Individualistic cultures (e.g., the USA and North European countries) emphasise personal autonomy, self-expression, and individual rights, whereas collectivistic cultures (e.g., Eastern and South European countries) prioritise group harmony, family, and community well-being. However, from the point of view of Fairtrade consumption, it is surprising that most of the consumption of these products is in individualistic countries, such as the Netherlands, the UK, or the USA [33]. However, in CEE, the reluctance to consume ethically sourced products reflects the region's unique geographical, socioeconomic, historical, and cultural contexts. Historically, the CEE underwent significant political and economic transformations following the collapse of communist regimes in the late 20th century. This transition from planned to market economies introduced new consumer behaviours and heightened exposure to global market trends, including ethical consumption. The initial post-transition period was marked by a focus on economic survival and adaptation to capitalist markets, often prioritising affordability and accessibility over ethical considerations. However, as economies stabilised and disposable incomes increased, a growing awareness and demand for ethically produced goods emerged. The adoption and interpretation of ethical consumption in these regions, therefore, reveal significant insights into both the local and global dimensions of sustainability.

Previous research in the Czech Republic has shown that the consumption of Fairtrade products is influenced by the socioeconomic factors of consumers, such as age, gender, education, place of residence, and income. The findings also indicated that Fairtrade products were purchased more often by younger and more educated customers living in Prague or cities with more than 100,000 inhabitants, while this behaviour was not dependent on income [62,63]. Moreover, women buy Fairtrade products more often than men do [64]. Among the main motives for Czech customers' purchasing Fairtrade products are moral principles followed by product quality [62].

2. Materials and Methods

2.1. Conceptual Framework

To fulfil the main research question mentioned above, we developed a conceptual research design that follows our three objectives (Figure 1). In the first phase, we concentrated on tropical fruit consumers' knowledge, attitudes, and preferences. In the second phase, we analysed consumers' attitudes towards ethical consumption and knowledge of certifications, focusing on the Fairtrade label as the most visible system of ethical and sustainable international certification in the region. Finally, we constructed a structured model that associates engagement with Fairtrade fruit with the other five independent constructs of consumers' attitudes.

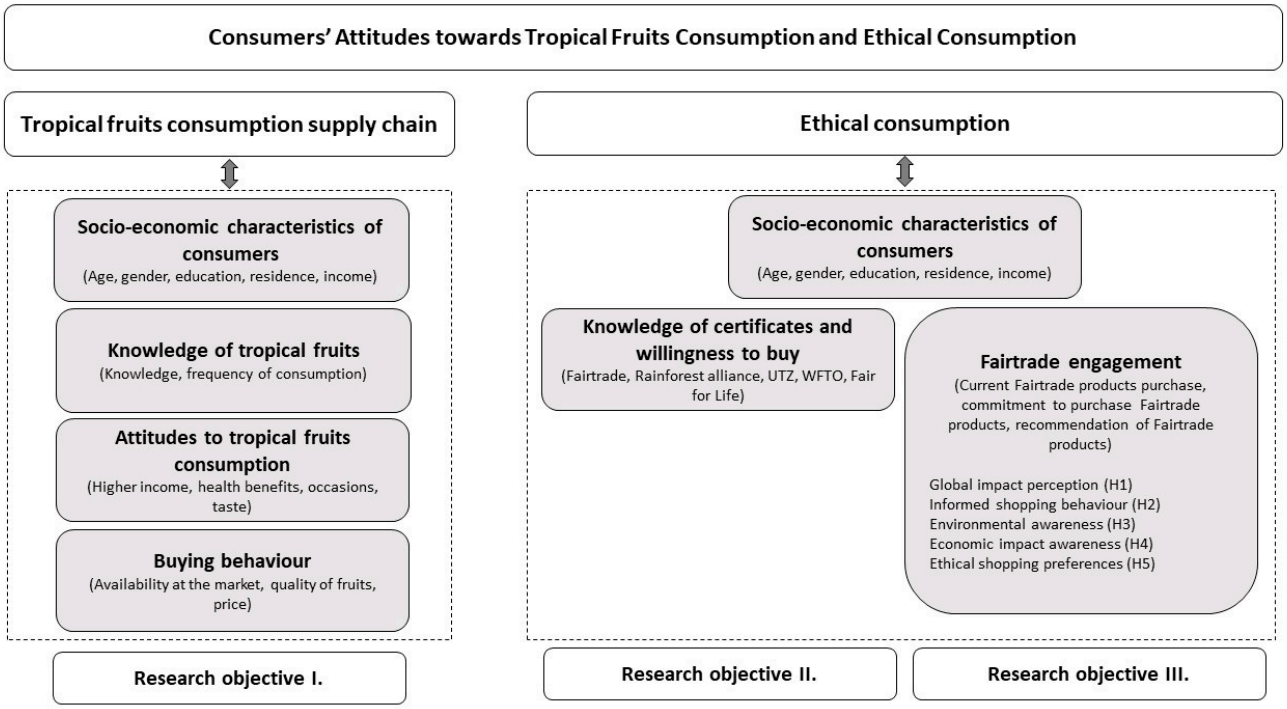

Figure 1. Conceptual design of the research.

During the first phase of the research, the data were collected as a questionnaire-based consumer survey to achieve research objective 1. The questionnaire was distributed in the Czech language through a professional company focused on collecting data—Ipsos Group. Participation was voluntary and self-administered for all participants who answered the questionnaire anonymously. Approximately 10 min were required to complete the questionnaire. The questionnaire was first pretested with a small group of volunteers, and on the basis of their recommendations, some items were reformulated and clarified. The first dataset was collected in the summer of 2019. The cross-sectional questionnaire comprised 10 multiple-choice questions about tropical fruit knowledge and consumption habits. In total, the 12 most consumed tropical fruits were selected: avocado, banana, carambola, dragon fruit, durian, guava, lychee, mango, papaya, passion fruit, pineapple, and rambutan. Citrus fruits were intentionally left out, as they constitute a broad commodity group. The questionnaire was divided into three sections, focused on (i) knowledge of tropical fruits and the frequency of their consumption, (ii) attitudes towards tropical fruit consumption (e.g., higher income, health benefits, occasion, taste), and (iii) factors related to buying behaviour (e.g., availability at the market, quality of fruits, price). Responses were reported via a 5-point Likert scale ranging from "Strongly agree" to "Neither disagree nor agree" to "Strongly disagree". In addition, the last section included the socioeconomic characteristics of the respondents, such as their gender, age, education, household size, residence, and income. The total sample included 841 respondents. Overall, the sample had an even distribution of female and male respondents aged 18 to 65 years, with an average age of 42.65 years ($\pm$13.31). Most of the respondents had some high school education (37%) and were living in large cities with over 100,000 inhabitants (24%).

In the second phase of the research, we focused on analysing consumer attitudes towards ethical consumption in order to fulfil research objectives 2 and 3. Owing to the worldwide COVID-19 pandemic, the second part of the data was collected in the summer of 2022. The questionnaire was distributed in the Czech Republic through a professional company, Median, which specialises in public surveys. Participation was voluntary and self-administered to all participants who answered the questionnaire anonymously. The cross-sectional questionnaire consisted of 17 multiple-choice questions. First, we focused on knowledge of the ethical certificates that are commonly available in the Czech market.

For the purposes of this study, we selected five certificates, namely, Fairtrade, Rainforest Alliance, UTZ, Fair for Life, and World Fair Trade Organization (WFTO). Although UTZ merged with the Rainforest Alliance in 2018, we kept both certificates, as they are still available on the market.

The same dataset was used for the analysis of the structured model focused on the relationship among Fairtrade engagement as the main dependent construct and five additional independent constructs with the potential to explain the ethical behaviour. We used the data for the construction of the structural equation model (SEM) to obtain the results for research objective 3. The questions focused on ethical, social, and environmental concerns were divided into the following categories: (i) Fairtrade engagement, (ii) global impact perception, (iii) informed shopping behaviour, (iv) environmental awareness, (v) economic impact awareness, and (vi) ethical shopping preferences. At the end of the questionnaire, the following socioeconomic characteristics of the respondents were assessed: gender, age, education, household size, residence, and income.

In the area of ethical consumption, survey participants may exhibit social desirability bias, leading them to overreact when presented with choices. Consequently, we opted for an unbiased pure recall method, which is distinct from the assisted recall approach, which involves presenting options [65]. In total, 1427 respondents participated in the survey, and 1425 valid responses were obtained after the data for unengaged responses were eliminated. To establish reliable estimates for our study, a minimum of 200 observations were needed, which is certainly met by our sample [66]. We observed a demographic profile with a slight majority of males (53.27%), a notable percentage of individuals aged 24 years or younger (28.45%), and a predominant education level in the category of high school with a diploma (41.18%).

2.2. Data Analysis

Attitudes towards tropical fruit consumption and knowledge of ethical labels among Czech consumers (objective 1) were evaluated by descriptive statistics. The factors potentially influencing the frequency of consumption of tropical fruits were divided into three categories, namely, socioeconomic factors influencing willingness to consume tropical fruits (age, gender, education, residence, and income), factors determining attitudes towards consumption (higher income, health benefits, occasions of consumption, taste), and factors influencing buying behaviour (availability at the market, quality of fruits and price). The data were analysed using ANOVA to identify any significant difference between the means of tropical fruit consumption and the factors characterising the respondents. We divided the respondents into three groups according to their habits of tropical fruit consumption. Regular consumers consume tropical fruits on a regular basis, occasional consumers consume tropical fruits only occasionally, and the last group consists of non-consumers, who state that they do not consume tropical fruits.

To analyse the purchasing behaviour of respondents in relation to Fairtrade products (objective 2), we divided them into three groups according to their approach to searching for products labelled with the Fairtrade logo. The first group consisted of active consumers, who stated that they actively look for products with the Fairtrade label. The second group consisted of passive consumers, who do not actively look for the Fairtrade label but occasionally buy Fairtrade products. The last group included non-consumers, who do not buy Fairtrade products. Differences between independent variables were considered statistically significant at $p < 0.05$.

To answer objective 3 and its hypotheses, the principal analysis of the complex interplay of factors potentially contributing to the decision of Czech consumers to engage in Fairtrade was performed via structural equation modelling (SEM). A prerequisite for SEM is the measurement model, which relates to the formation of the measurement items to their respective latent variables. We used the mathematical programming software R version 4.1.0.3, in particular, the *lavaan* package and SmartPLS 4 for SEM [67,68].

For the SEM, the conceptual model consisted of six latent variables (one dependent and five independent), each with at least two observed variables. All variables, except for Fairtrade engagement, represent our exogenous variables. The variables potentially influencing the Fairtrade engagement were identified in the literature. They are also summarized in Table 1. In addition to the five exogenous variables in our model, we included six control variables (sociodemographic characteristics of the respondents) that could influence Fairtrade engagement. The model was constructed around the major construct specified in the conceptual framework—Fairtrade engagement—based on the three measured items: (i) consumption of Fairtrade products, (ii) intention to continue consume them, and (iii) the likelihood of recommending them to other buyers.

Table 1. Operationalisation of the ethical consumption analysis.

Category	Statement	Item	Code	Scale
Fairtrade Engagement (Dependent variable)	Current Fairtrade product purchases	I typically buy Fairtrade products	FE_2	1 = I don't buy Fairtrade products at all, 5 = I look actively for Fairtrade products and prefer them
	Commitment to purchasing Fairtrade products	Are you planning to buy a Fairtrade-certified product or products in the next 6 months?	FE_3	1 = Definitely no, 5 = Definitely yes
	Recommendation of Fairtrade products	How likely are you to recommend purchasing Fairtrade-certified products to someone close to you (family, friends, colleagues) in the future?	FE_1	1 = Definitely no, 5 = Definitely yes
Global Impact Perception (Construct 1 related to H1)	How much do these topics affect you?	Terrorism	GIP_1	1 = Not interested at all, 5 = Strongly interested
		Epidemics of diseases such as HIV/AIDS, malaria and others	GIP_2	
		Poverty in developing countries	GIP_3	
		Natural disasters in the world	GIP_4	
		Natural disasters in the Czech Republic	GIP_5	
		Wars	GIP_6	
Informed Shopping Behaviour (Construct 2 related to H2)	To what extent do the statements correspond to the way you personally shop?	Before I buy any product, I carefully study its label	ISB_1	1 = Not interested at all, 5 = Strongly interested
		I always want to have enough information about the goods I buy	ISB_2	
		I am interested in the origin of the goods I buy	ISB_3	
		When I buy a product, I am interested in its effect on a person's health	ISB_4	
Environmental Awareness (Construct 3 related to H3)	How much do these topics affect you?	Environmental pollution	EA_1	1 = Not interested at all, 5 = Strongly interested
		Climate change	EA_2	
		Deforestation	EA_3	
		Animal rights	EA_4	

Table 1. *Cont.*

Category	Statement	Item	Code	Scale
Economic Impact Awareness (Construct 4 related to H4)	How much do these topics affect you?	Food prices	EIA_1	1 = Not interested at all, 5 = Strongly interested
		Energy prices	EIA_2	
Ethical Shopping Preferences (Construct 5 related to H5)	To what extent do the statements correspond to the way you personally shop?	When shopping, I prefer products labelled bio	ESP_1	1 = Not interested at all, 5 = Strongly interested
		By purchasing certain products, I support brands that behave in a socially and environmentally responsible manner	ESP_2	
		I prefer products that have been made with human and labour rights in mind	ESP_3	

Prior to conducting confirmatory factor analysis (CFA), we assessed the normality of the measurement items using both multivariate and univariate normality tests. This is essential, as the estimation method employed in CFA, as well as SEM, relies on the assumption of normally distributed data. The Mardia test, with a p value less than 0.05, rejects the null hypothesis of multivariate normality; similarly, the Shapiro–Wilk test, with p values less than 0.05 for all measurement items, rejects the null hypothesis of univariate normality. Consequently, instead of the maximum likelihood (ML) estimator, which would have been adopted with normally distributed data, we utilised the maximum likelihood robust (MLR) estimator, also known as the Satorra-Bentler rescaling method, to estimate the measurement model [67].

The data for the measurement items were gathered through the above-described self-reported questionnaire employing a 5-point Likert scale. Exploratory factor analysis (EFA) of the 22 items revealed a robust six-factor model, as shown in Table 2. This initial model was subsequently validated through CFA, indicating the consistency and reliability of the identified factors. The table shows the standardised factor loadings (outer loadings) derived from the CFA model. Notably, all exogenous variables within our model exhibited statistical significance at the 1% level (p value < 0.001), indicating that the items effectively capture their respective latent constructs. This statistical confirmation aligns with the principles of convergent validity in the measurement model, as outlined by Anderson & Gerbing [69].

Table 2. Measurements items.

Constructs	Mean (Std. Dev.)	Outer Loadings	Cronbach's Alpha
EA_1 ← Environmental Awareness	2.04 (0.99)	0.859	0.815
EA_2 ← Environmental Awareness	2.31 (1.12)	0.833	
EA_3 ← Environmental Awareness	2.33 (1.12)	0.801	
EA_4 ← Environmental Awareness	2.56 (1.20)	0.709	
EIA_1 ← Economic Impact Awareness	1.70 (0.89)	0.985	0.756
EIA_2 ← Economic Impact Awareness	1.78 (0.95)	0.735	
ESP_1 ← Ethical Shopping Preferences	3.44 (1.16)	0.812	0.804
ESP_2 ← Ethical Shopping Preferences	2.78 (1.09)	0.873	
ESP_3 ← Ethical Shopping Preferences	2.87 (1.14)	0.858	
FE_1 ← Fairtrade Engagement	4.10 (1.49)	0.915	0.873
FE_2 ← Fairtrade Engagement	4.42 (1.13)	0.897	
FE_3 ← Fairtrade Engagement	3.22 (1.17)	0.864	

Table 2. *Cont.*

Constructs	Mean (Std. Dev.)	Outer Loadings	Cronbach's Alpha
GIP_1 ← Global Impact Perception	2.67 (1.25)	0.730	0.864
GIP_2 ← Global Impact Perception	3.14 (1.25)	0.693	
GIP_3 ← Global Impact Perception	3.07 (1.14)	0.810	
GIP_4 ← Global Impact Perception	2.70 (1.11)	0.841	
GIP_5 ← Global Impact Perception	2.31 (1.12)	0.714	
GIP_6 ← Global Impact Perception	2.12 (1.14)	0.787	
ISB_1 ← Informed Shopping Behaviour	2.82 (1.14)	0.827	0.817
ISB_2 ← Informed Shopping Behaviour	2.43 (0.99)	0.811	
ISB_3 ← Informed Shopping Behaviour	2.50 (1.07)	0.805	
ISB_4 ← Informed Shopping Behaviour	2.52 (1.05)	0.770	
AGE ← Age	37.06 (14.31)	1.000	
EDU ← Edu	3.97 (1.29)	1.000	
INCOME ← Income	3.78 (1.34)	1.000	
S07A_HSD_SIZE ← HH Size	2.96 (1.20)	1.000	
SEX ← Sex	0.53 (0.50)	1.000	
SIZECITY ← Size City	190.68 (78.09)	1.000	

CFA model fit: χ^2 (1406) = 344.18, CFI = 0.940, TLI = 0.969, RMSEA = 0.038, SRMR = 0.047.

Furthermore, we carried out further checks to assess convergent validity. Table 3 includes the values for the average variance extracted (AVE). The AVE is expected to surpass 0.50 [70] for convergent validity, and our model's AVE estimates indeed exceeded this criterion.

Table 3. Measurement reliability.

Constructs	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	Average Variance Extracted (AVE)
Economic Impact Awareness	0.756	1.983	0.858	0.755
Environmental Awareness	0.815	0.830	0.878	0.644
Ethical Shopping Preferences	0.804	0.808	0.885	0.719
Fairtrade Engagement	0.873	0.882	0.922	0.797
Global Impact Perception	0.864	0.906	0.893	0.584
Informed Shopping Behaviour	0.817	0.819	0.879	0.646

Additionally, Table 3 provides insights into the reliability of the factors through the presentation of the Cronbach's alpha [71] and composite reliability (CR) values. All the factors have Cronbach's alpha and CR values that surpass the recommended threshold of 0.70, as proposed by Hair et al. [72]. This reaffirms the robustness and internal consistency of the factors in our model. Thus, the reliability of the measurement model was established.

The second aspect of the validity testing involves evaluating discriminant validity through the Fornell-Lacker criterion [73]. This approach involves comparing the square root of the average variance extracted (AVE) with the correlation of latent constructs [70]. For a latent construct, it is expected to better account for the variance of its own indicators than the variance of other latent constructs. Consequently, the square root of each construct's AVE should exhibit a higher value than its correlations with other latent constructs [70].

Another approach to assess discriminant validity is through the Heterotrait–Monotrait (HTMT) ratio of correlation. Henseler et al. [74] advocated for the effectiveness of this method based on a Monte Carlo simulation study, demonstrating superior specificity and sensitivity rates (97% to 99%) compared to the cross-loadings criterion (0.00%) and Fornell–Lacker criterion (20.82%). An HTMT value approaching 1 suggests a lack of discriminant validity. Utilizing HTMT as a criterion involves comparing it to a predefined threshold, and if the HTMT value surpasses this threshold, it indicates a lack of discriminant validity.

Some authors recommend a threshold of 0.85 [75], while Gold et al. [76] challenge this and propose a threshold of 0.90.

For divergent or discriminant validity (DV), we present the results for the Fornell–Larcker criterion and the Heterotrait–Monotrait ratio estimates in Tables 4 and 5, respectively. For the Fornell–Larcker criterion, the values below the diagonal represent our correlation values, while the diagonal values represent the square root of each AVE. From the results presented in Table 4, all the correlations are less than the value of AVE, which establishes divergent validity for our model. This confirms that each variable has higher explanatory power with itself than with what it shares with other variables.

Table 4. Fornell–Larcker criterion estimates.

Latent Constructs	Economic Impact Awareness	Environmental Awareness	Ethical Shopping Preferences	Fairtrade Engagement	Global Impact Perception	Informed Shopping Behaviour	Age	Edu	Income	HH Size	Sex	Size City
Economic Impact Awareness	0.869											
Environmental Awareness	0.242	0.802										
Ethical Shopping Preferences	−0.011	0.524	0.848									
Fairtrade Engagement	−0.058	0.346	0.54	0.892								
Global Impact Perception	0.295	0.681	0.403	0.217	0.764							
Informed Shopping Behaviour	0.107	0.406	0.598	0.381	0.357	0.804						
Age	−0.19	−0.007	0.176	0.182	−0.144	−0.091	1					
Edu	0.016	−0.005	−0.024	−0.157	−0.019	−0.112	0.135	1				
Income	0.105	0.03	0.067	−0.095	0.046	0.026	0.057	0.239	1			
HH Size	0.037	0.036	−0.04	−0.062	0.041	0.019	−0.286	−0.053	−0.095	1		
Sex	−0.122	−0.224	−0.251	−0.133	−0.237	−0.092	−0.037	0.026	−0.156	−0.004	1	
Size City	−0.023	−0.059	−0.095	−0.081	−0.059	−0.068	−0.119	−0.026	0.013	−0.123	0.014	1

Table 5. Heterotrait–Monotrait ratio estimates.

	Economic Impact Awareness	Environmental Awareness	Ethical Shopping Preferences	Fairtrade Engagement	Global Impact Perception	Informed Shopping Behaviour	Age	Edu	Income	HH Size	Sex	Size City
Economic Impact Awareness	1											
Environmental Awareness	0.337	1										
Ethical Shopping Preferences	0.048	0.643	1									
Fairtrade Engagement	0.055	0.398	0.633	1								
Global Impact Perception	0.435	0.796	0.448	0.212	1							
Informed Shopping Behaviour	0.168	0.494	0.736	0.446	0.417	1						
Age	0.28	0.057	0.196	0.191	0.194	0.1	1					
Edu	0.049	0.051	0.027	0.169	0.034	0.124	0.135	1				
Income	0.103	0.036	0.074	0.101	0.061	0.029	0.057	0.239	1			
HH Size	0.046	0.044	0.045	0.065	0.054	0.022	0.286	0.053	0.095	1		
Sex	0.132	0.256	0.279	0.14	0.249	0.102	0.037	0.026	0.156	0.004	1	
Size City	0.033	0.064	0.105	0.083	0.078	0.077	0.119	0.026	0.013	0.123	0.014	1

As part of a robustness check, we examined the threshold values for the Heterotrait–Monotrait ratio estimates, as illustrated in Table 5. In our analysis, the obtained values consistently fall below 0.8, well below the recommended threshold of 0.85. This outcome indicates a high level of reliability in our estimates, underscoring the distinctiveness of each latent variable from the others. The consistent confirmation of these values reinforces the robustness of our findings, supporting the unique nature of each latent variable within the model.

Furthermore, the goodness of fit for the measurement model is evident, as demonstrated by the Comparative Fit Index (CFI) and the Tucker–Lewis Index (TLI), surpassing the suggested threshold of 0.90. Additionally, the Root Mean Square Error Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR) fall below the specified cut-off value of 0.08, in accordance with the criteria set by Hair et al. [70].

Common method bias arises from measurement errors attributed to methodological factors. An example is the utilization of a uniform measurement scale, such as a 5-point Likert scale, across all survey questions, which may introduce common method bias. Podsakoff et al. [77] propose several statistical approaches to address this bias, each with its advantages and drawbacks. In our analysis, we opted for Harman's single factor test, a widely adopted method. We conducted an unrotated exploratory factor analysis using the 22 items loading onto a single latent factor. Despite this rigorous analysis, the AVE by the single factor amounted to only 31%, well below the recommended cut off of 50%. Consequently, it can be asserted that common method bias does not pose a significant concern in the context of this study.

3. Results

The results are structured into three main subchapters related to the three objectives of our study.

3.1. Attitudes Towards Tropical Fruit Consumption

The findings related to our first objective indicate that the most frequently consumed fruits among Czech consumers are bananas (99%), pineapples (94%), and mangoes (78%) (Figure 2). The next most preferred category of tropical fruits, which are consumed regularly or occasionally by at least 50% of the respondents, includes avocados (65%) and lychees (57%). Other tropical fruits are consumed regularly or occasionally by fewer than 36% of the respondents. In contrast, the least familiar tropical fruits are guava (11%), rambutan (8%), and durian (7%).

Most respondents consume tropical fruits on a weekly basis (50%) and prefer fresh fruits the most (93%). Approximately 20% of the respondents consume tropical fruits monthly, whereas only 15% did so daily. Notably, men reported daily consumption more frequently than women did. The remainder classified their consumption of tropical fruits as exceptional (15%). In addition to the fresh form, juices were also mentioned, with their popularity primarily observed among individuals aged 18 to 26 years. For more than 40% of the respondents, seasonal changes do not affect their consumption habits regarding tropical fruits. Conversely, nearly 20% of the respondents prefer consuming these fruits during the winter season, particularly around Christmas. The summer season is favoured, especially by younger individuals (approximately 40% of respondents aged 18 to 26), whereas the winter period is preferred by the older generation (aged 54–65). Most respondents purchase fruit from supermarkets (approximately 95%), with approximately 20% buying from street markets, followed by specialised stores. Only approximately 5% of the respondents acquire these goods through e-shops, with the largest proportion being individuals aged 27 to 35. Information about tropical fruits is obtained primarily from the internet (approximately 65%), followed by recommendations from friends and family. Various literature sources, leaflets, brochures, and television or radio broadcasts are of lesser significance (each less than 20%).

Consumers generally agreed that tropical fruits were well available at the Czech market (4.05 on a scale from 1 to 5) and recognized them as healthy and nutritious (4.26).

There was strong agreement on liking the taste of tropical fruits (4.48), which was the most positively rated aspect. However, opinions on the quality of tropical fruits in the Czech market were more neutral (3.33), and consumers largely disagreed with the idea that tropical fruits were cheap in the Czech Republic (2.55). Similarly, there was a low level of agreement with consuming tropical fruits primarily during special occasions (2.54). Finally, respondents showed moderate agreement that an increase in income would lead to higher consumption of tropical fruits (3.35).

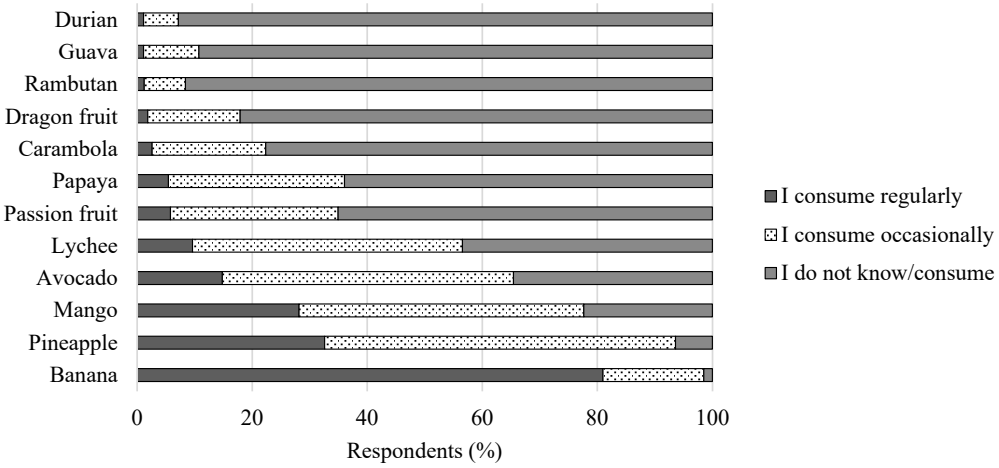

Figure 2. Preferences for tropical fruit consumption by Czech respondents. Source: Tropical fruits respondents (N = 841).

For a more detailed analysis, attention was directed towards bananas and avocados, the two most consumed tropical fruits with significant and contentious impacts on social and environmental production conditions in tropical regions. As illustrated in Tables 6 and 7, there are notable differences among consumers of bananas and avocados, particularly concerning their attitudes and purchasing behaviours. Education emerged as a crucial factor influencing the frequency of consumption of both fruits. The respondents categorised as non-consumers of tropical fruits have the lowest levels of education and, in the case of avocados, are also associated with lower income levels. Among the measured attitudes, non-consumers of avocados are less likely to increase their consumption with rising income. Regular consumers presented the highest values for perceived health benefits related to the consumption of both fruits. For bananas, non-consumers indicated the highest likelihood of purchasing bananas only on special occasions, albeit infrequently. Preference based on taste is strongest among regular banana consumers. This group also has the highest belief in the ready availability of bananas. Interestingly, non-consumers held the strongest belief that tropical fruits were inexpensive.

Table 6. Factors influencing the frequency of consumption of avocados.

	Avocados						**ANOVA Avocados**	
	Regular Consumers	**SD**	**Occasional Consumers**	**SD**	**Non-Consumers**	**SD**	**F**	**Sig.**
Socioeconomic factors influencing willingness to consume tropical fruits								
Age	40.07	12.69	43.72	13.49	41.76	13.31	4.12	0.016
Gender	0.52	0.50	0.48	0.50	0.50	0.50	0.35	0.706
Income	3.93	2.19	3.90	1.91	3.47	1.83	4.83	0.008
Education	2.66	0.93	2.66	0.87	2.45	0.86	5.19	0.006
Size of the city	3.01	1.48	3.23	1.44	3.04	1.39	2.08	0.125

Table 6. *Cont.*

	Avocados						ANOVA Avocados	
	Regular Consumers	**SD**	**Occasional Consumers**	**SD**	**Non-Consumers**	**SD**	**F**	**Sig.**
Factors determining the attitudes towards consumption *								
Higher income	3.67	1.23	3.39	1.16	3.16	1.18	8.31	<0.001
Health benefits	4.35	0.60	4.28	0.63	4.20	0.76	2.42	0.090
Occasions	2.65	1.20	2.55	1.17	2.47	1.11	1.07	0.343
Taste	4.66	0.51	4.54	0.57	4.31	0.76	16.53	<0.001
Buying behaviour *								
High availability at the market	4.04	0.83	4.05	0.83	4.06	0.78	0.05	0.950
Quality of the fruits is high	3.34	1.07	3.31	0.91	3.36	0.92	0.20	0.820
The price of tropical fruits is cheap	2.60	1.18	2.52	1.01	2.56	1.03	1.08	0.343

Note: Variable descriptions: Age (years), Gender (0 = male; 1 = female), Income (1 = up to 8000 CZK/month; 10 = +70,000 CZK/month), Education (1 = primary; 4 = university), Size of the city (1 = <1000; 5 = >100,000); * 1 = strongly disagree; 5 = strongly agree; higher income = if my income increases, my consumption increases. Source: Tropical fruits respondents (N = 841).

Table 7. Factors influencing the frequency of consumption of tropical bananas.

	Bananas						ANOVA Bananas	
	Regular Consumers	**SD**	**Occasional Consumers**	**SD**	**Non-Consumers**	**SD**	**F**	**Sig.**
Socioeconomic factors influencing willingness to consume tropical fruits								
Age	42.58	13.28	42.44	13.95	38.92	11.02	0.45	0.641
Gender	0.51	0.50	0.44	0.50	0.33	0.49	1.92	0.147
Income	3.81	1.98	3.59	1.77	2.92	1.08	1.89	0.152
Education	2.63	0.88	2.46	0.84	1.75	0.97	7.79	<0.001
Size of the city	3.11	1.42	3.23	1.49	3.17	1.40	0.38	0.681
Factors determining the attitudes towards consumption *								
Higher income	3.41	1.19	3.08	1.15	3.25	1.42	4.48	0.012
Health benefits	4.31	0.67	4.04	0.63	4.25	0.75	9.71	<0.001
Occasions	2.48	1.15	2.79	1.12	2.83	1.40	4.62	0.010
Taste	4.54	0.60	4.25	0.69	3.75	1.36	20.09	<0.001
Buying behaviour *								
High availability at the market	4.09	0.78	3.92	0.90	3.50	1.00	5.59	0.004
Quality of the fruits is high	3.36	0.94	3.18	0.91	3.42	0.90	2.42	0.089
The price of tropical fruits is cheap	2.57	1.05	2.42	0.95	3.17	1.34	12.13	<0.001

Note: Variable descriptions: Age (years), Gender (0 = male; 1 = female), Income (1 = up to 8000 CZK/month; 10 = +70,000 CZK/month), Education (1 = primary; 4 = university), Size of the city (1 = <1000; 5 = >100,000); * 1 = strongly disagree; 5 = strongly agree; higher income = if my income increases, my consumption increases. Source: Tropical fruits respondents (N = 841).

3.2. Knowledge of Ethical Labels

In the second phase of the research, the awareness of dominant ethical certifications among Czech consumers was examined, with a focus on those that had recently emerged in the country and were available for tropical fruit from the Global South. The findings indicate that the highest level of awareness was associated with Fairtrade certification, whereas the lowest level was related to Fair for Life (Figure 3). Specifically, 42% of the respondents reported familiarity with Fairtrade, whereas only 7% were aware of Fair for Life. Further investigation into Fairtrade certification revealed that nearly half of the respondents were uncertain whether they had purchased a Fairtrade product in the

past 12 months, suggesting a significant level of unintentional or passive consumption of Fairtrade products. Despite this, over half of the respondents (55%) expressed an intention to purchase a Fairtrade product within the next six months. Trust in Fairtrade certifications was notably high, with 75% of respondents indicating their trust in it. When assessing the association between product quality and Fairtrade certification, 50% of the respondents stated that quality was unrelated to the Fairtrade logo, whereas 33% believed that Fairtrade products were of higher quality than regular products. However, the dissemination of information through personal recommendations was limited, with only 15% of respondents reporting that they had recommended Fairtrade products to others.

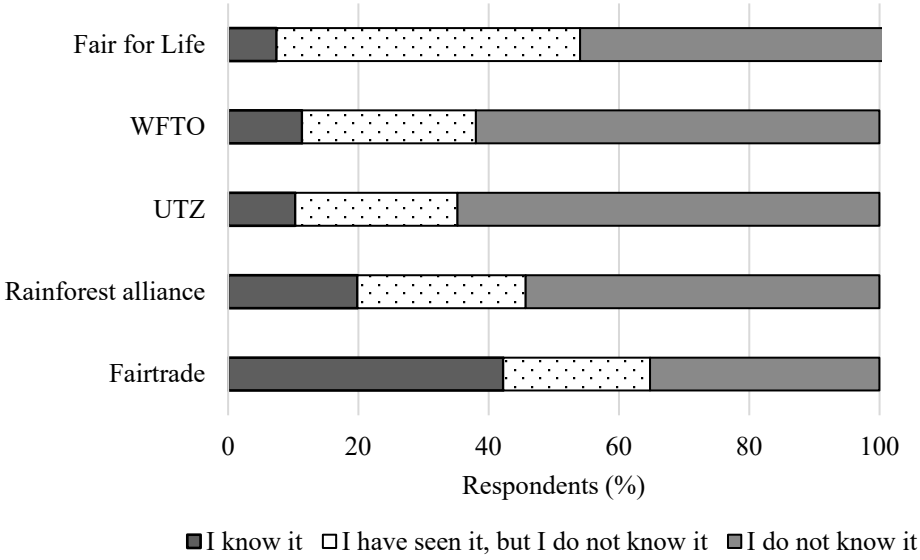

Figure 3. Knowledge of certificates by Czech respondents. Note: WFTO = World Fair Trade Organization. Source: Ethical consumption respondents (N = 1425).

For a more detailed analysis, we categorised the respondents into three groups—active consumers, passive consumers, and non-consumers—based on their Fairtrade product purchases over the past 12 months (Table 8). The active consumer category included relatively younger respondents with an average age of 33, predominantly women with higher education degrees. Passive respondents, defined as those who were uncertain about whether they had purchased Fairtrade products in the last 12 months, were typically men with an average age of 38. In contrast, non-consumers were generally older, with an average age of 40.2 years. Confidence in the Fairtrade logo was highest among active consumers, whereas non-consumers exhibited the lowest level of trust in the logo. With respect to perceptions of product quality, active consumers believed that regular products were probably of better quality than Fairtrade products, whereas non-consumers were more definitive, asserting that regular products were of superior quality. In terms of future purchasing intentions, active consumers intended to continue buying ethical products, and passive consumers also showed interest in purchasing Fairtrade products. When asked about recommending Fairtrade products to friends, only active consumers were likely to do so.

Table 8. Comparison of respondents' characteristics among different types of (non)consumers of Fairtrade products.

Factors	Active Consumers N = 425		Passive Consumers N = 642		Non-Consumers N = 357		ANOVA Test
	Mean	SD	Mean	SD	Mean	SD	*p*-Value
Age	33.11	13.38	37.78	14.39	40.20	14.01	<0.001
Gender	1.59	0.49	1.49	0.50	1.53	0.50	0.007

Table 8. *Cont.*

Factors	Active Consumers N = 425		Passive Consumers N = 642		Non-Consumers N = 357		ANOVA Test
	Mean	SD	Mean	SD	Mean	SD	*p*-Value
Education	4.26	1.33	3.86	1.27	3.80	1.22	<0.001
Size of the city	1.98	0.83	1.90	0.77	1.83	0.73	0.033
Trust in the FTP logo	1.68	0.56	2.19	0.68	2.52	0.82	<0.001
Quality confirmation	2.99	1.57	3.76	1.46	3.93	1.38	<0.001
Willingness to buy FTP within 6 months	1.62	0.64	2.53	0.70	3.06	0.73	<0.001
Recommendation of FTP to friends	1.50	0.50	2.00	0.00	2.00	0.00	<0.001

Note: Variable description: Age (years), Gender (1 = male; 2 = female), Education (1 = primary; 6 = university), Size of the city (1 = <5000; 3 = >100,000), Trust (1 = I definitely trust, 4 = I don't trust at all), Quality confirmation (1 = FTP is definitely BQ than RP, 2 = FTP is probably BQ rather than RP, 3 = RP is probably BQ than FTP, 4 = RP is definitely BQ than FTP, 5 = FTP label is not related to product quality), FTP = Fairtrade product, RP = regular product, BQ = better quality, Willingness to buy FTP within 6 months (1 = Strongly agree, 5 = Strongly disagree), Recommendation of FTP to friends (1 = yes, 2 = no). Source: Ethical consumption respondents (N = 1425).

3.3. Determinants of Fairtrade Fruit Consumption

A detailed analysis was conducted to examine the factors influencing Fairtrade engagement via structural equation modelling (SEM). The establishment of a measurement model is foundational to SEM, which links measurement items with their corresponding latent variables. As illustrated in Figure 4, the most significant positive influence among our focal constructs was the ethical shopping preferences construct. This construct encompasses general preferences for environmentally and socially responsible purchases and support for brands deemed ethical by consumers. The second most significant influence was environmental awareness among consumers, which includes their concern for environmental pollution (the strongest relationship), climate change, deforestation, and animal rights (the weakest relationship). The influence of informed shopping behaviour, which involves careful label reading, a need for comprehensive information about the product and its origin, and its health impacts, was positively but weakly related to Fairtrade engagement. Economic impact awareness, concerning the importance of food and energy prices to consumers, was negatively but weakly related. Similarly, global impact perception, which involves concerns about international terrorism, disease epidemics, natural disasters, wars, and global poverty, also demonstrated a negative but weak relationship.

Our control variables indicate that age has a significantly positive effect, whereas longer formal education, size of the household, and income seem to influence Fairtrade engagement negatively.

Aside from evaluating the normality of the measurement via both multivariate and univariate normality tests and reliability and validity tests of our model, the measurement model exhibited a robust fit, as evidenced by the comparative fit index (CFI) and the Tucker–Lewis index (TLI) exceeding the suggested threshold of 0.90, whereas the root mean square error approximation (RMSEA) and standardised root mean square residual (SRMR) fell below the specified cut-off of 0.08, aligning with the guidelines from Hair et al. [78]. A summary of the testing of the constructs is provided in Table 9.

Table 9. Summary of the hypothesis testing.

Hypothesis	Std. Coefficient (Std. Dev.)	Z
Economic Impact Awareness → Fairtrade Engagement	−0.052 (0.029)	1.765 **
Environmental Awareness → Fairtrade Engagement	0.133 (0.033)	4.132 ***
Ethical Shopping Preferences → Fairtrade Engagement	0.397 (0.029)	13.662 ***
Global Impact Perception → Fairtrade Engagement	−0.04 (0.03)	1.432 *
Informed Shopping Behaviour → Fairtrade Engagement	0.107 (0.026)	4.085 ***

Table 9. *Cont.*

Hypothesis	Std. Coefficient (Std. Dev.)	Z
Age → Fairtrade Engagement	0.118 (0.024)	4.746 ***
Edu → Fairtrade Engagement	−0.128 (0.023)	5.639 ***
Income → Fairtrade Engagement	−0.104 (0.023)	4.536 ***
HH Size → Fairtrade Engagement	−0.035 (0.022)	1.581 *
Sex → Fairtrade Engagement	−0.037 (0.047)	0.791
Size City → Fairtrade Engagement	−0.024 (0.023)	1.035

Note: Standard error in parenthesis. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

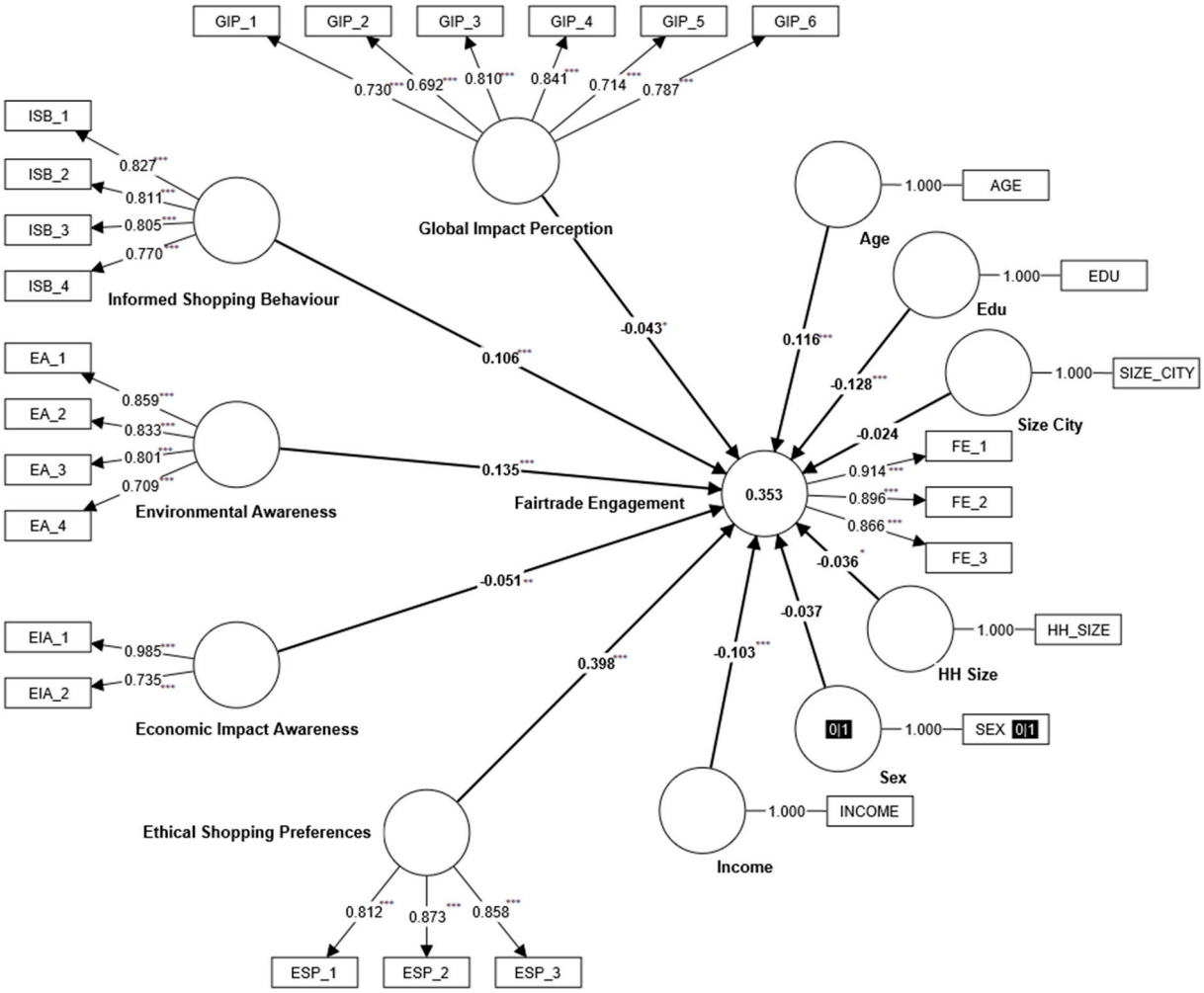

Figure 4. Estimated structural equation model. Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. SEM fit: χ^2 (1406) = 2944.391, CFI = 0.940, TLI = 0.969, RMSEA = 0.038, SRMR = 0.052. Source: Ethical consumption respondents (N = 1425).

4. Discussion

The general ethical consumption landscape in CEE is shaped by several factors. First, there is an increasing influence of EU policies and regulations, which promote sustainability and ethical practices. Countries that more recently joined the EU, such as Poland, Hungary, and the Czech Republic, have been integrating these regulations, leading to improved environmental standards and consumer protection laws. This legislative framework supports the development of ethical consumption by ensuring that products meet specific ethical criteria. Second, local cultural values play a crucial role. In many parts of CEE, there is a strong tradition of localism and community-oriented consumption. This

is manifested in the popularity of farmers' markets, local artisans, and the preservation of traditional crafts. Such practices inherently support ethical consumption by fostering sustainability, reducing the carbon footprint associated with transportation, and supporting local economies. Moreover, civil society and nongovernmental organisations, which are still relatively underdeveloped in comparison with those in Western Europe, have been instrumental in advocating for ethical consumption. Organisations focused on environmental protection, human rights, and Fairtrade have been educating consumers about the impact of their purchasing decisions. Campaigns and initiatives led by these organisations have increased public awareness and encouraged more responsible consumer behaviour. However, challenges remain in fully integrating ethical consumption into mainstream practices. Economic disparities across the region mean that not all consumers can afford to prioritise ethics over cost. Furthermore, the legacy of socialist economies, where consumer choice is limited, has left some scepticism towards market-driven ethical claims. Effective communication and education are crucial to overcoming these barriers, emphasising the long-term benefits of ethical consumption for society and the environment.

Our results revealed that the most popular tropical fruits among Czech consumers are bananas and pineapples, which have long been among the traditional fruits most commonly imported into the country, even during the communist period. Moreover, there has been an evident increase in preferences for mango, avocado, and lychee in recent years. This trend is likely influenced by increased income, greater opportunities to travel to tropical countries, a wider range of foreign restaurants and international cuisine, and the promotion of healthy products. For example, avocado is often referred to in the media as a superfood. However, knowledge and regular consumption of other types of tropical fruit, such as papaya or carambola, are still low among Czech consumers. The socioeconomic characteristics associated with increased consumption of tropical fruits are also consistent with previous findings reported by Italian and Belgian respondents [38,39]. As a consequence, we selected bananas and avocados from the group of the most consumed fruits because of their known questionable impact on production countries and studied the factors influencing their consumption in more detail. We found that higher education and higher income generally contribute to higher preferences for these two categories, although non-consumers still perceive both types as cheap fruit. Regular consumers also perceive health benefits as a reason for their consumption. Nevertheless, bananas still dominate in terms of availability and preference. To increase the consumption of other tropical fruits, appropriate communication about their nutritional properties and health benefits among potential consumers is therefore advisable. These recommendations also align with WHO priorities, highlighting the need for regular fruit and vegetable consumption in general [3]. The introduction of tastings in retail stores and price promotions to stimulate trial purchases might also support an increase in interest in other types of tropical fruit, such as dragon fruit or rambutan.

In the last two decades, several ethical labels have spread in the Czech Republic, and their recognition and preferences are slowly growing [56]. Some of them can also be found on fruits imported from tropical regions of the Global South. From the studied group of the five most common ethically responsible certifications, Fairtrade was the most recognised product label, and almost every second respondent knew it (although Fairtrade Czech Republic and Slovakia estimates that knowledge of the certification is even higher) [56]. Even though the Czech Republic is a continental country with no direct strong historical connection with countries in the Global South, the declared interest in Fairtrade certification already appears relatively high and is expected to increase, as more than half of the respondents indicated an intention to purchase Fairtrade products in the near future. Additionally, the vast majority of the respondents expressed strong confidence in this certification, and one-third of consumers believed that Fairtrade products were of higher quality than regular products. Despite the fact that many consumers declared the importance of these ethical factors [79,80], the question remains whether respondents translate their intentions into actual shopping behaviour in stores, as their concerns do

not lead to actual purchase behaviour [81–83]. This phenomenon is referred to as the ethical attitude–behaviour gap, and has already been studied from various perspectives, including in the context of Fairtrade certification [33]. Potential consumers are also often influenced by the fact that other information about the product, such as the brand name or ingredient information (or organic label), is marked more prominently and thus prevails in attractiveness over the Fairtrade label [84]. Although consumers expressed positive attitudes towards ethical principles, in reality, the practical side prevails during shopping, when customers tend to approach food shopping more in the form of fast shopping and do not have as much time to study the individual attributes of the product. Their final decision is typically influenced by extrinsic factors (e.g., brand name, price) and intrinsic product factors (e.g., quality perception) [33]. The purchase of Fairtrade products often seems unintentional and passive, and Czech consumers buy ethical products because they are available as a result of the top-down business and marketing strategies of major retailers, which are dominantly controlled from abroad (Germany, the United Kingdom, the Netherlands, and Austria).

As in other countries, active consumers of Fairtrade products are mainly younger women with higher education levels [85]. We also found signs of individualised shopping behaviour and limited communication about ethical purchases. Most consumers do not share their experiences with ethical products with their friends and family. Consequently, the strategy of word-of-mouth communication is not as effective as it typically is with other products.

Another known factor influencing typical consumer behaviour regarding ethical tropical fruit is price. Retailer, brand, size, origin, and quality (ready-to-eat) are typically critical factors in pricing. Consumers generally make purchasing decisions on the basis of their awareness of wanting to obtain the maximum value for the product price [86]. Therefore, the price of goods can eventually become a barrier to ethical consumption [87], particularly for low-income consumers. In addition, previous studies have shown that customers are willing to pay a higher price for Fairtrade products such as, for example, Fairtrade coffee [60,88]. It was shown that a higher income had an effect on the consumption of avocados, but this trend was not conclusive for bananas. A study among Italian consumers confirmed that high consumption of tropical fruits was positively associated with a relatively high level of household income [88]. Nevertheless, the Czech ethical market is relatively young, especially in relation to ethical tropical fruits, and the prices depend on the pricing strategy of a few dominant players. Thus, the current price is primarily a decision framed by their marketing strategies. But when the ethical fruit market expands to other supply chains and retailers and the volume increases, the pressure to maintain the minimal price difference also increases.

To understand the detailed factors influencing the decision to engage with Fairtrade-certified tropical fruits, we employed robust multivariate SEM methods. Attitudes related to ethical shopping preferences, such as the intention to support socially and environmentally responsible brands or bio products, contribute the most to Fairtrade engagement. Ethical shopping preferences showed the most decisive influence: "By purchasing certain products, I support brands that behave socially and environmentally responsibly", or "I prefer products that have been produced with respect to human and labour rights". Therefore, our hypothesis H5 was confirmed. The second most important driving factor is environmental awareness and sensitivity to current environmental challenges, such as pollution, deforestation, and climate change, with a minor influence on the perception of animal rights (hypothesis H3). A positive but weak association was also shown between Fairtrade engagement and the influence of informed purchasing behaviour, such as careful label reading, the need to supplement information about the product and its origin, and the expected impact on health (hypothesis H2). From this perspective, Czech consumers seem to already be accustomed to the labelling of products by independent third-party organisations, and they adjust their shopping behaviour accordingly. Herédia-Colaço et al. [33] suggested that if consumers are familiar with a brand, Fairtrade certification can

dominate the purchase decision. However, if they are unfamiliar with the product or brand, Fairtrade certification can be only a particular enhancement factor on the packaging.

Economic and global challenges are not significantly relevant to forming ethical shopping behaviour among Czech consumers. Therefore, our hypothesis H1 and H4 could not be confirmed. It is clear that most consumers strongly associate social (Fairtrade) with environmental (bio) labels, and their engagement with Fairtrade is limited primarily by the need to contribute to mitigating our planet's environmental challenges. Economic and global problems, including the perception of poverty, play a minor role in the current drive for ethically labelled products, and even regular Fairtrade consumers do not seem to perceive a strong relationship with their purchases [89]. This contradicts the findings of a study from Japan that compared the perceptions of environmental and labour issues influencing the purchase of ethical coffee. This should be reflected in the promotion strategies of supportive NGOs and retailers. The development and sustainability of the relatively small sector of ethical tropical fruit retail in the Czech Republic require more profound education of consumers, who must understand that ethical products involve a holistic combination of environmental, social, and economic aspects that react to the negative impact of conventional tropical fruit production and global trade. These aspects must be considered when planning marketing and communication strategies aimed at increasing awareness of Fairtrade products.

The results also provide interesting results related to the control variables; higher age has a significantly positive effect on higher Fairtrade engagement, whereas longer formal education, bigger household size, and higher income influence Fairtrade engagement negatively. These findings may be related to the fact that Fairtrade products are sold mainly in standard supermarket chains and not in typical higher-end luxury or specialised ethical stores, as is common in countries with a longer history of ethical shopping. In neighbouring Germany and Austria, Fairtrade products are well known owing to the grassroots activism of the widespread and organised networks of ethical shops (so-called Weltladen shops). They attract their own engaged and active customers. In the Czech Republic, the concept of specialised ethical shops has failed. There were ten such shops in Prague, Brno and all major cities at the turn of the millennium, but currently, only one remains functional in the capital city. Larger families also seem to prefer conventional cheaper products.

The current study also has potential limitations. The data collection was divided into two phases, with the first phase focusing on the knowledge, attitudes, and preferences of Czech tropical fruit consumers (data collection in 2019). In the second phase of data collection, we focused on consumer attitudes towards social responsibility and knowledge of certifications. Owing to the global COVID-19 pandemic, we postponed data collection, and the second phase of data collection continued only in 2022. Although the data sets were collected at different times, both contain a representative sample of respondents for the Czech Republic. A representative sample for the Czech Republic, with a population of approximately 10.5 million, would typically include a sample size of at least 385 respondents for a 95% confidence level and a 5% margin of error. Both data sets fulfil this condition. The sociodemographic characteristics of the respondents participating in two data collection phases are presented in Table 10. The table illustrates significant differences between the respondents' ages and their educational attainments across the two data sets, which should be taken into account when interpreting the results. However, we do not attempt to make any comparisons or inferences between the two different datasets as part of our results.

We recommend that further research should focus in more detail on the sensory evaluation of tropical fruits in relation to consumer preferences, as taste was reported as an essential factor influencing attitudes to consumption. In addition, it would be appropriate to identify the reasons why consumers of Fairtrade products do not share their experiences with their peers and, therefore, word-of-mouth marketing strategies are not effective.

Table 10. Sociodemographic characteristics of respondents.

Variables	Tropical Fruits Respondents (N = 810)		Ethical Consumption Respondents (N = 1425)		
	Mean	**SD**	**Mean**	**SD**	***p*-Value**
Age	42.65	13.31	36.98	14.25	<0.001
Gender	0.50	0.50	0.53	0.50	0.118
Education	2.58	0.88	2.73	0.95	<0.001
Size of the city	1.86	0.77	1.91	0.78	0.156

Note: Variable descriptions: Age (years), Gender (0 = male; 1 = female), Education (1 = primary; 4 = university), Size of the city (1 = <5000; 3 = >100,000).

5. Conclusions

This study evaluated the potential of the ethical consumption of tropical fruits as a tool for improving production conditions among producers in the Global South and harmonising the Czech market with the current political priorities of the EU related to sustainable and inclusive global supply chains. Ethical tropical fruit consumption in the Czech Republic is evolving and growing, and is influenced by EU regulations, changes in shopping practices, and the efforts of civil society.

The European Commission Corporate Sustainability Due Diligence Directive introduces obligations for large companies to ensure compliance with human rights and environmental sustainability criteria within their activities and supply chains. However, companies face a delicate balance between profitability, social responsibility, and environmental impact. This research can shed light on how companies trading with tropical fruits can align their business strategies with sustainability goals while maintaining competitiveness in the context of the CEE region, which differs from the rest of the EU regarding historical experience, consumer culture, and purchasing possibilities. Understanding this balance is essential for achieving positive business and societal outcomes.

Most consumers are already familiar with the wide range of various tropical fruits. Although the Czech market for tropical fruits has expanded in recent years, most consumers still regularly consume only their limited range. Bananas, pineapples, mangoes, and avocados are purchased typically weekly in a fresh form without any seasonal variations. Half of Czech consumers know of Fairtrade products, and the label maintains a high level of trust among ethical certifications. However, many consumers are relatively passive in their purchases, and only younger female consumers actively seek ethical labels. Shopping behaviour is also very individualised, and communication within consumers' social networks is limited. Our analysis also shows that consumers engage with ethical products because they associate them with environmental benefits, human or labour rights, or the associated brands. Economic issues and poverty in the Global South contribute little to purchase decisions. In the short run, practitioners and brand communication managers should emphasise these aspects in well-designed communication strategies. We recommend, for example, connecting consumers with producers through pictures and infographics at points of sale in supermarket stores, building awareness by sharing producer stories in leaflets, or using QR codes on products with access to detailed information about the producers and their livelihoods.

In the long run, a more profound education of consumers and the public about both the connections between the global environmental and the social and economic challenges related to production and trade can make ethical purchases more solid and sustainable. Global education within formal educational systems, supported by governmental policies and reinforced through the activity of mass media, is crucial in shaping informed and socially responsible citizens. Continued support from governmental and nongovernmental actors will be essential in fostering this transition and ensuring ethical consumption becomes a widespread and sustainable practice in the CEE region.

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