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# AMATEUR RUNNERS' WILLINGNESS TO PAY FOR SUSTAINABLE ENVIRONMENTAL INITIATIVES IN GREECE

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**Abstract:**
This study investigates the willingness-to-pay (WTP) of amateur long-distance runners for the implementation of environmentally sustainable initiatives during competitive running events, beyond the standard registration fee. A sample of 327 amateur runners (226 males, 101 females) was recruited through snowball sampling and completed an online survey disseminated via Facebook over six weeks. The questionnaire encompassed demographic and socioeconomic variables, general WTP, participants' perceptions of event attributes and specific environmental measures, alongside their environmental attitudes relating to the purchase of eco-friendly products. Respondents were also requested to quantify their additional monetary contribution beyond the participation cost. Findings reveal that the majority of participants exhibit a high WTP for eco-friendly interventions in race organization. Organizational and environmental event factors predominantly influenced specific environmental actions that were highly valued, yet overall positive engagement. Among the independent variables examined, only gender demonstrated a statistically significant effect, suggesting the need for further exploration. This research is pioneering within the Greek context, aligning with comparable international studies, and uniquely provides a quantitative assessment of WTP. The results offer critical insights for event organizers regarding the financial viability of integrating sustainable practices. Future research should expand on these findings with larger, more representative samples, incorporating motivational factors and perceived service quality as predictors of WTP.

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**Keywords:** willingness to pay, long-distance runners, marathon runners, environmental sustainability in sports, environmentally friendly initiatives

## 1. Introduction

Physical activity constitutes a widespread social practice and an important industry, with connections to economics, politics, culture, and social issues. In recent years, sustainability has emerged as a central issue for sports organizations and events, as it concerns the relationship of sports activity with environmental protection, social cohesion, and social entrepreneurship (Hautbois & Desbordes, 2023). The running movement in Greece is a dynamic and growing form of amateur physical activity, with universal participation and motivations linked to physical, mental, and social health (Georgiou *et al.*, 2024).

However, the ever-increasing number of events and participation raises questions about the environmental burden and the sustainability practices adopted by the organizers, such as reducing the environmental footprint and managing the by-products of the races. The cost of such actions burdens the organizers. However, the answer lies in the willingness to pay (WTP) an additional amount to support the implementation of environmentally friendly activities by participants in corresponding sports events. This research evaluates the WTP for an additional amount by amateur runners for the implementation of environmentally sustainable actions, exploring its relationship with socio-demographic variables and attitudes of environmental sensitivity. The results can support and indicate strategies in the private and public sectors to promote green practices, enhance sustainability in the amateur running community, and policy-making in the Greek sports field of participatory physical activity in general.

## 2. Literature Review

Sustainability is a complex and intricate concept. This is evident from the fact that there is no commonly accepted definition of it by the global research community. Its most famous definition was given by the Norwegian Prime Minister Brundtland during her speech to the United Nations World Commission on Environment and Development. This definition describes sustainable development as *"…development that meets the needs of the present without compromising the ability of future generations to meet their own needs*." (Holdgate, 1987).

This specific definition is presented as simple and comprehensive. However, the research approach and the study of the concept are interdisciplinary and in connection with different scientific fields. Such fields constitute the three pillars of sustainable development, as mentioned in the specific speech of the Norwegian Prime Minister: the social, the economic, and the environmental pillars. Depending on the field in which the research process develops, the definition of the concept is adapted accordingly (O'Dwyer & Owen, 2005). Environmental sustainability is the ecological foundation of the three

pillars, focusing on conserving natural resources and reducing the ecological footprint. It is recognized as a critical factor in aligning the other two pillars, framing sustainability as a conceptual framework that interweaves economic and social dimensions (Ashby *et al.*, 2012). The environmental pillar of sustainability is an integral part of sustainable development, focusing on the preservation of natural ecosystems and ensuring that human activities do not deplete or degrade the environment.

The role of corporate responsibility in promoting environmental sustainability cannot be overstated. Corporate sustainability practices, including environmentally friendly products and community involvement, are critical to promoting a sustainable future. Companies must recognize their responsibility to actively engage in practices that mitigate environmental damage and contribute positively to their communities (Goyal *et al.*, 2015). This perspective reinforces the idea that environmental sustainability extends beyond compliance and should incorporate proactive measures that encourage industry-wide shifts toward sustainable operations.

Addressing climate change and the various environmental issues created by it are priority issues that require immediate management through the development of policies and the implementation of corresponding actions at the individual, social, business, industrial, and governmental-institutional levels (De Pryck, 2021). The sports system and the sports industry significantly burden the environment, as it has an exceptionally high environmental footprint due to their events, especially in relation to the emission of greenhouse gases and carbon dioxide ($CO_2$) (Wicker, 2019; IOC, 2021).

Sport is a distinct social system, which, however, interpenetrates and interacts with larger primary social systems, such as the economic, political, and broader social systems. By extension, sustainability in Sport is part of the overall action and effort to implement the principles of sustainable development. The limited development of policies and the limited action of those involved in the sports industry endanger the development of the sector, the environment, and also the health and safety of participants, something for which the sports industry often receives severe criticism (Canniford & Hill, 2022; IPCC, 2021).

The implementation of sustainable development policies and actions is implemented through all stakeholders in the sports system. In particular, sports organizations and businesses, as the main stakeholders in high-profile sporting events, clearly express their interest and show high levels of commitment to taking initiatives related to the implementation of sustainable development policies (Trail & McCullough, 2020). The interaction of environmental sustainability and Sport is a growing area of research that highlights the dual influence of Sport on environmental attitudes and practices, as well as on the environmental impacts caused by sports activities.

The impact of climate change is increasingly recognized as a critical factor affecting the sustainability of Sport. Increased awareness of climate-related consequences among sports fans may foster a pro-environmental behavior, suggesting the need to integrate climate change education into the sports experience (Hwang *et al.*, 2024). Such research results highlight the two-way relationship between Sport and the environment,

presenting a framework for understanding how the fragile climate balance can affect sports organizations and events (Orr & Inoue, 2019).

### 2.1 WTP for Environmental Sustainability Initiatives in Sports

The willingness-to-pay (WTP) for sustainability initiatives in the sports sector represents a crucial aspect of consumer behavior that is associated with the increasing emphasis on environmental responsibility. A growing body of literature examines various dimensions that influence participants' willingness to pay extra for sustainability initiatives, highlighting the potential for sports organizations to leverage their influence to advocate for the environment while simultaneously enhancing revenue streams through committed consumer support.

The importance of direct consumer engagement in response to sustainability campaigns in sports is particularly highlighted. Sports professionals are increasingly looking for ways to financially support sustainability efforts through sponsorships, although they face uncertainty about sports consumers' reactions to these initiatives (McCullough *et al.*, 2022). This suggests that effectively communicating sustainability goals enhances the WTP, as fans react more positively when they understand the environmental impacts behind sponsorships. Furthermore, it is demonstrated that sports consumers are willing to pay additional amounts to support environmental initiatives. This finding highlights the potential for sports organizations to integrate sustainability into their funding models if they effectively communicate their strategies to fans (Greenhalgh & Drayer, 2020).

Furthermore, the relationship between marketing and consumer behavior in sustainability initiatives is crucial. Sports organizations can leverage fans' emotional ties to their teams or communities, effectively increasing positive perceptions of their willingness to pay extra for sustainability initiatives. A unique and targeted marketing approach that resonates with fans' identities and relationships can strengthen their commitment to their team's sustainability efforts (Trail & McCullough, 2020).

Similarly, the fit between sustainability campaigns and sports organizations significantly influences fan support, where well-implemented initiatives can improve fan trust and engagement (Harrison *et al.*, 2022). Furthermore, the perception that promoting sustainability can alienate fans, especially those who are less environmentally inclined, is challenged. Additionally, it is presented as an opportunity for sports organizations to use inclusive sustainability messages that appeal to a broader audience, thereby increasing the WTP for green initiatives in sports (Kellison *et al.*, 2024).

Another area of interest is the role of cultural and community ties in shaping the WTP. Research results have shown that the implementation of sustainability policies at major sporting events can effectively raise public awareness of environmental issues related to the sports sector, thereby enhancing a sense of shared responsibility that enhances fans' willingness to contribute financially to sustainability actions (Sher & Fusco, 2024).

Furthermore, they provide insights into corporate social responsibility (CSR) in the sports arena, in relation to how these practices influence consumer perceptions and willingness to support sustainable initiatives. Effective CSR strategies can motivate organizations and fans to engage in proactive sustainability efforts, ultimately translating into higher WTP and increased financial support for environmentally friendly initiatives (Babiak & Trendafilova, 2011).

As a research example of the WTP for environmental sustainability actions in Sport, Thormann and Wicker (2021) investigated how sports club members perceive and express their willingness to support environmental initiatives financially. This study gains relevance amid a growing focus on sustainability in the sports sector, highlighting the need for clubs to adopt environmentally friendly practices, both to enhance operational efficiency and community goodwill.

The primary objective of this study was to assess the factors that influence members' willingness to pay extra for environmental measures within their clubs. The researchers aimed to explore the motivations behind members' financial contributions to sustainability initiatives, as well as the potential impact of such measures on club dynamics and member relationships. This research has significantly helped non-profit sports clubs develop effective funding strategies for implementing environmental initiatives (Thormann & Wicker, 2021).

The study found that members' environmental attitudes significantly influenced their willingness to pay extra. Individuals who identified as environmentally conscious or had previously participated in sustainability programs showed a higher willingness to pay extra. In addition, social norms played a role, as members who associated with a supportive peer group regarding environmental actions were more likely to express their willingness to contribute financially.

**2.2 WTP for Environmental Sustainability Initiatives in Long-distance Running Events**

Over the last 20 years, there has been a particularly increased interest in the WTP, with an additional amount when registering for an amateur mass participation race, with the aim of enhancing the undertaking of initiatives and actions to enhance environmental sustainability. In these studies, the approach of voluntary enhancement of environmental sustainability actions was investigated with different independent variables each time.

An increasingly interesting area of research addresses the intersection of environmental sustainability and athletic participation, focusing specifically on marathon races. A relatively recent study addresses a critical gap in the existing literature on pro-ecological intentions in the context of sporting events and the extent to which marathon runners are willing to support economically sustainable practices (Könecke *et al.*, 2021).

The results of the study revealed several notable findings. First, there was a significant awareness gap, as a significant proportion of respondents reported limited knowledge about the environmental impacts associated with sporting events. However, despite this awareness gap, many participants expressed a strong willingness to pay for

sustainable practices such as waste management and carbon offset initiatives of the event. This suggests that while awareness may still be developing, there is a significant willingness among marathon runners to embrace and support environmentally friendly initiatives when integrated into events (Könecke *et al.*, 2021).

Concretizing the research interest in environmental sustainability in road racing, Ribet and Brander (2020) investigated the environmental awareness of road racers and their willingness to contribute financially to the sustainability of urban parks in Hong Kong. With the growing popularity of road racing and growing concern about environmental degradation, this research provides valuable insights into potential funding mechanisms for the conservation of natural spaces used by runners.

The primary objective of this research was to examine the extent to which trail runners in Hong Kong are willing to pay for sustainable practices in urban park management. Given Hong Kong's unique ecological context and high population density, the study highlights the importance of balancing recreational use of natural areas with environmental conservation. It seeks to determine not only how much trail runners are willing to pay, but also the motivations behind their willingness, contributing to the broader dialogue on sustainable tourism and the management of recreational running physical activity (Ribet & Brander, 2020).

The results showed a significant willingness among trail runners to pay extra for sustainable practices in Hong Kong's urban parks. Approximately 75% of participants expressed a positive WTP, with significant variation based on income levels and environmental attitudes. The study found that those with higher incomes were generally more willing to pay for improved facilities and conservation efforts, highlighting the correlation between socioeconomic factors and environmental concerns. More specific findings revealed that the majority of trail runners prioritized biodiversity protection and trail maintenance as key areas for investment. Most participants recognized the critical link between enjoyment of the activity and the health of the natural environment. The study concluded that implementing a user fee system designed to maintain and improve the quality of urban parks could provide a sustainable source of funding for conservation efforts (Ribet & Brander, 2020).

In a similar study, Hugaerts and Könecke (2024) investigated the factors influencing participants' willingness to support sustainability initiatives during sporting events financially. This study is particularly relevant in the context of growing environmental concerns in the sports industry and provides valuable insights into consumer behavior related to participatory events such as marathons and road races. The primary objective of this research is to identify the key determinants that influence the WTP for environmental sustainability initiatives during participatory sporting events. The study seeks to understand how demographic variables, environmental attitudes, and perceived benefits of environmentally friendly measures contribute to participants' WTP. By examining these determinants, the article offers important implications for event organizers seeking to align sustainability practices with participant preferences (Hugaerts & Könecke, 2024).

The results of the study revealed several important insights regarding runners' willingness to pay for environmental initiatives. Such variables include the General Willingness to Pay, where approximately 65% of participants expressed a WTP for an additional amount for sustainability initiatives, as an average monetary value. This finding demonstrates a significant level of support among runners for pro-environmental measures. In terms of influencing factors, the analysis showed that intrinsic motivational factors, such as personal environmental values and previous experiences with sustainable practices, played a critical role in influencing the WTP. Participants with a more substantial commitment to sustainability were more likely to indicate a higher level of WTP.

Similarly, demographic variables showed significant differences in willingness to pay extra based on demographic characteristics. Younger participants and those with higher income levels showed a greater willingness to contribute financially to sustainability initiatives. Conversely, participants who reported lower levels of education expressed a lower willingness to pay extra, highlighting the need for targeted education and communication strategies to raise awareness.

Finally, regarding perceived benefits, the results showed that participants who perceived tangible benefits - such as improved racing experiences and positive community impact - were more willing to pay for sustainability initiatives. This suggests a direct relationship between participants' perceptions of value and their willingness to invest financially in environmental actions (Hugaerts & Könecke, 2024). The findings highlight that to increase the willingness to pay extra, event organizers should strengthen their communication about the benefits of sustainability initiatives and engage with participants on environmental issues. Future research could also extend these findings by exploring longitudinal trends in willingness to pay extra as sustainability initiatives evolve within the sports landscape.

In Greece, research activity has begun to address this issue in recent years. Triantafyllidis and Kaplanidou (2018) delve into the relationship between marathon participants' environmental awareness and their WTP for carbon offsets related to the event. This study is important as it examines how pro-environmental attitudes can influence financial support for sustainability initiatives, particularly in the context of outdoor sporting events that are often associated with natural landscapes. The primary objective of the research is to assess the extent to which marathon participants are willing to contribute financially to offset the $CO_2$ emissions generated by the event. The authors explore the mediating role of environmental consciousness in this relationship, providing insight into how personal values and beliefs about environmental sustainability can drive financial decisions. This research is particularly relevant in light of the increasing emphasis on sustainability in the sports sector, as it aims to inform event organizers about potential ways to raise funds through participants' contributions to environmentally friendly practices.

The results of this study demonstrated the factors that influence the WTP for $CO_2$ offset. Specifically, in terms of General WTP, approximately 60% of participants

expressed a willingness to pay an amount for a $CO_2$ offset, with an average WTP amounting to specific monetary values. This suggests a significant market potential for financing sustainability initiatives through participant contributions. An important result was the role of Pro-Environmental Consciousness. The findings confirmed that pro-environmental consciousness significantly affects the relationship between participants' attitude towards sustainability and the WTP for $CO_2$ offset. Those with higher levels of environmental concern and awareness were notably more willing to pay additional fees to support sustainability measures. Regarding demographic variations, the analysis showed that younger participants and those with higher income levels were more likely to show a higher level of willingness to pay extra for $CO_2$ offset measures. Furthermore, participants with previous experience in participating in environmentally focused events expressed a greater tendency to contribute financially (Triantafyllidis & Kaplanidou, 2018).

Similar research was conducted in South Africa, where researchers investigated participants' willingness to pay extra for initiatives aimed at offsetting the environmental impacts associated with marathon events. This research contributes to understanding how sporting events can adopt more sustainable practices by assessing the financial viability of such measures based on participant contributions (Krugel & Saayman, 2013). The main objective of this research is to assess the willingness to pay extra for various environmental initiatives by participants in the Old Mutual Two Oceans Marathon, one of the largest and most popular marathons in Africa. Given the growing awareness of sustainability issues in the sports sector, this study seeks to quantify the financial contributions runners are willing to make to support environmental measures, such as carbon offsetting and sustainable management protocols.

The study yielded several notable findings. First, the General Willingness to Pay, where approximately 65% of participants indicated a willingness to pay an additional amount for environmental initiatives. This demonstrates a significant potential for athletes to contribute to sustainability efforts within the marathon.

In terms of influencing factors, the analysis revealed that participants' levels of environmental awareness significantly influenced their willingness to pay extra. Those who expressed strong environmental beliefs, such as the need to preserve natural landscapes, were more willing to support economically sustainable initiatives. This suggests that promoting environmental awareness may increase commitment to carbon offsetting among marathon participants. Demographic variables showed significant differences in the willingness to pay extra, as observed across levels of demographic variables, particularly in relation to income levels and previous marathon experience. Participants with higher incomes generally demonstrated greater willingness to pay extra for environmental initiatives. At the same time, experienced runners were more willing to contribute, likely due to their familiarity with sustainability issues in Sport. Finally, the effect of perceived benefits showed that the association between perceived benefits and willingness to pay was also significant. Participants who recognized the positive environmental impact of the offset measures were more likely to express their willingness

to pay, suggesting that effectively communicating these benefits can enhance participants' engagement in sustainability practices.

## 3. Material and Methods

The participants of this study were amateur runners, regardless of other demographic, social, and psychological characteristics. Initially, 327 people responded with complete answers. The research tool used consisted of three different parts. The first part was a cover letter that presented the researcher's personal details, the purpose of the research, information about the voluntary nature of participation, the anonymity and confidentiality of the responses, as well as the use of the response data only for research purposes. The second part consisted of a questionnaire on the demographic, social, and economic characteristics of the participants. Such characteristics were gender, age, marital status, income, employment, and level of education. It also contained questions about their running habits, such as frequency, volume in kilometers, and hours of training per week, as well as the years of systematic involvement in running activity. At the same time, a question was also incorporated regarding whether they are marathon runners or not. Finally, two questions were also incorporated, which were based on the hypothetical scenario of participating in a race. The questions concerned the general intention to pay, in case of participating in the same race in the future, an additional amount or percentage of the participation value. The purpose of the questions was to quantify the intention to pay. These specific questions were based on the research of Hugaert and Könecke (2023).

The third part of the questionnaire consisted of five (5) questions and was structured based on the standard questionnaire of the research by Könecke and his colleagues (Könecke *et al.*, 2021). The questionnaire consisted of the initial question of the General Intention to Pay, which concerned the WTP for an additional amount when participating in a race in the future in which they have already participated, and four (4) additional questions. The first question, "*How strongly have you personally been concerned with the issue of sustainability in sports?*", aimed to investigate whether and to what extent the environmental sustainability of an event is an interesting point for the participants. This specific question was answered on a 5-point Likert scale, where 1 = not at all and 5 = very strongly. The second question, "*How strongly do the following factors influence the positive evaluation of your participation in a race event?*" was aimed at investigating the factors perceived as important for their participation by the participants. The question regarding ecological actions was added to the responses in order to investigate the ecological behavior of the participants in relation to the other questions asked. The following two questions, "*If you are thinking of buying an environmentally friendly product, which statement describes you better?"* and "*Initiatives for which you would be willing/not to pay an additional amount when registering for the event"*, aimed at investigating attitudes towards sustainability and the specific WTP an additional amount for environmental sustainability actions and when participating in a competitive running event. This

specific question allowed for eleven responses according to the questionnaire of Könecke and his colleagues (Könecke *et al*., 2021), while four additional questions were added according to the example of Hugaert and Könecke (2023) ("*use of green energy*", "*more sustainable advertising material*", "*reduction of $CO_2$ emissions of the event*" and "*less water consumption*"). Finally, a question was included to assess the importance of official control of environmental measures, which concerned the certification of supplier companies in terms of compliance with environmental standards, and an additional question concerning social measures in terms of the certification of supplier companies in terms of compliance with social standards.

The questionnaire was initially converted into an electronic questionnaire. Using social media (Facebook), it was sent to the websites of organized groups of amateur runners throughout Greece. The answers were returned in a coded format with numbers corresponding to each answer. Data was exported in Excel, evaluated, and processed appropriately. The initial waiting time from the first mailing of the questionnaire was four (4) weeks. A reminder and re-sending were then carried out, and the waiting time was another two (2) weeks. The process began in early May and was completed in mid-June 2025.

For the statistical analysis of the data and the extraction of the results, descriptive statistical analysis was performed with relative and absolute frequencies, means, and standard deviations. To investigate possible relationships between the independent and dependent variables, inferential statistical analyses were performed with parametric and non-parametric criteria (test of independence with the chi-square statistical criterion, test of differences in means with the t-test statistical criterion for independent samples, and analysis of variance).

## 4. Results and Discussion

### 4.1 Descriptive Statistics Results

Regarding the sample, 327 participants answered all the questions, which shows a high motivation to contribute by providing their opinion and contributes significantly to the quality of the research. The majority of participants were men, lived in a household with a partner and children, had a high educational level, with the majority holding a university degree, a master's degree, or a doctoral degree, had a medium to high income, and were professionally active mainly in the private sector. The detailed demographic data are presented in Table 1.

**Table 1:** Absolute and Relative Frequencies of Social, Economic and Demographic Characteristics of Participants

| | N | % |
|---|---|---|
| **Gender** | | |
| Male | 226 | 69,1% |
| Female | 101 | 30,9% |
| **Household Structure** | | |
| I live alone | 60 | 18,3% |
| Married/Cohabiting without children | 59 | 18,0% |
| Married/Cohabiting with children | 163 | 49,8% |
| Single-Parent Family | 21 | 6,4% |
| I live with my parents | 24 | 7,3% |
| **Education Level** | | |
| Compulsory | 1 | 0,3% |
| Secondary | 32 | 9,8% |
| Post-secondary | 46 | 14,1% |
| Tertiary | 132 | 40,4% |
| MSc/PhD | 116 | 35,5% |
| **Net Household Income** | | |
| I have no income | 7 | 2,1% |
| Up to 12,000 | 34 | 10,4% |
| 12.001 - 20.000 | 92 | 28,1% |
| 20.001 - 30.000 | 84 | 25,7% |
| 30.001 - 40.000 | 48 | 14,7% |
| 40.001 - 50.000 | 30 | 9,2% |
| 50,000 and above | 32 | 9,8% |
| **Professional Employment** | | |
| Unemployed | 16 | 4,9% |
| Private Employee | 144 | 44,0% |
| Civil servant | 87 | 26,6% |
| Freelancer | 67 | 20,5% |
| Retired | 13 | 4,0% |

Regarding the age of the participants, the average was M. = 46.46 (SD = 9.77), and the distribution was normal (Table 2).

**Table 2:** Mean and Standard Deviation of the Independent Variable of Age

| N | Mean | SD. |
|---|---|---|
| 326 | 46.46 | 9,772 |

Regarding the running habits of the sample, the average training frequency in times trained per week is M. = 4.05 (SD = 1.65), the average hours trained per week is M. = 5.6 (SD = 3.66), the average training volume in kilometers per week is M. = 42.43 (SD = 27.58), while the average years of systematic training is M.. = 10.88 (SD = 9) (Table 3).

**Table 3:** Means & Standard Deviations of the Participants' Running Habits

| | N | Mean | SD. |
|---|---|---|---|
| Training Frequency Times/Week | 327 | 4.05 | 1.65 |
| Training Hours/Week | 325 | 5.60 | 3.66 |
| Training Volume Kilometers/Week | 325 | 42.43 | 27.58 |
| Years of Systematic Engagement with Running | 326 | 10.88 | 9.00 |

Regarding the WTP, an additional amount, as an absolute amount and as a percentage of the registration and participation fee in a race, the average amount amounted to M. = 7.32 (SD = 13.99). In contrast, the average percentage amounted to M. = 1.19 (SD = 16.48) (Table 4).

**Table 4:** Means & Standard Deviations and Normality Test of Distribution of Amount and Percentage of Intention to Pay

| | N | Mean | SD. |
|---|---|---|---|
| Payment Amount | 327 | 7.32 | 13.99 |
| Payment Rate | 327 | 1.19 | 16.48 |

Finally, the most significant percentage of the sample stated that they have finished a marathon and are therefore marathon runners, compared to those who are not (Table 5).

**Table 5:** Absolute and Relative Frequencies of the Independent Variable of Marathoner Trait

| | N | % |
|---|---|---|
| Yes | 229 | 70.0% |
| No | 98 | 30.0% |

### 4.2 Inductive Statistics Results

As for the results of inductive statistics, they are presented in terms of the four questions that were posed from the beginning. The presentation of the results is done in terms of these questions.

- **Question 1:** If you were to participate in the event again next year, would you be willing to pay an additional amount, beyond the participation fee, to support the enhancement of the event's environmental sustainability?

Regarding the General WTP, an additional amount for the implementation of environmentally sustainable actions when participating in a race, statistical tests were performed between the independent variables (gender, age, marital status, income, level of education, profession, marathon runners) and the General Willingness to Pay (Yes – No).

The results of the descriptive statistics showed that the majority of the sample (N = 238, 72.8%) is positive about paying an additional amount for environmental actions (Table 6).

**Table 6:** Absolute & Relative Frequencies of General Willingness to Pay

| | **N** | **%** |
|---|---|---|
| Yes | 238 | 72.8% |
| No | 89 | 27.2% |

Regarding the results of inductive statistics, the $\chi$ 2 criterion was used. Regarding gender, it was shown that there is a statistically significant relationship between the independent (gender) and the dependent variable ($\chi^2_{(1,327)}$ = 11,280, $p$ < .001). On the contrary, no statistically significant relationships were observed for the variables of marital status ($\chi^2_{(4,327)}$ = 5,419, $p$ = .247), education level ($\chi^2_{(4,327)}$ = 3,050, $p$ = .549), income ($\chi^2_{(6,327)}$ = 11,485, $p$ = .074), occupation ($\chi^2_{(4,327)}$ = 1,608, $p$ = .807) and marathon runner status ($\chi^2_{(1,327)}$ = .389, $p$ = .528). Finally, when testing the probability of predicting the dependent variable of WTP by the independent variable of age, no statistically significant relationship emerged ($F_{(1,324)}$ = 2.911, $p$ = .089).

Regarding the testing of the statistical significance of possible differences in means between different levels of the independent variables with respect to the dependent variable, *t*-tests for independent samples and analysis of variance (Analysis of Variance, ANOVA) were performed. The results showed that, in terms of gender, there were statistically significant differences between the mean levels of the independent variable ($t_{(248,531)}$ = 3,778, $p$ < .001) with the mean of men ($M.$ = 1.33, $SD$ = .47) being higher than that of women ($M.$ = 1.15, $SD$ = .357) with the size of the difference in means ($M.D.$ = .179, 95%$CI$: .086 - .272) being significant, while no statistically significant differences were observed between the mean levels for the variables, marital status ($F_{(4,322)}$ = 1,356, $p$ = .249), education level ($F_{(4,322)}$ = .758, $p$ = .553), income ($F_{(6,320)}$ = 1.941, $p$ = .074), profession ($F_{(4,322)}$ = .398, $p$ = .810) and the average of being a marathon runner ($M.$ = 1.26, $SD$ = .441) or not ($M.$ = 1.30, $SD$ = .459) ($t_{(325)}$ = -.63, $p$ = .529) ($M.D.$ = -.034, 95%$CI$: -.14 - .072) on the dependent variable of General WTP.

- **Question 2:** How Intensively Have You Personally Dealt with the Issue of Sustainability In sport?

In this question, participants were asked to respond to the intensity with which they address the issue of environmental sustainability in sports, using a 5-point Likert scale (1 = No Impact, 5 = Quite Large Impact). This specific question was asked with the aim of investigating only the factor of environmental sustainability and not social or economic sustainability.

To investigate the intensity with which runners deal with the issue of environmental sustainability, a frequency analysis was initially carried out, showing that the majority of runners saw an average impact (N = 90, 27.5%), enormous impact (N = 83, 25.4%) and relatively significant impact (N = 54, 16.5%), creating a positive attitude of interest in environmental sustainability with a high overall percentage (N = 227, 69.4%). As for the overall performance of the sample in relation to the intensity of interest in

environmental sustainability, it appeared that it was above the arithmetic mean (*M.* = 3.15, *SD* = 1.24) (Table 7).

**Table 7:** Absolute and Relative Frequencies of Intensity of Interest in Environmental Sustainability in Sport

| | **N** | **%** |
|---|---|---|
| **No Impact** | 43 | 13.1% |
| | 57 | 17.4% |
| | 90 | 27.5% |
| | 83 | 25.4% |
| **Quite Large Impact** | 54 | 16.5% |
| **Mean (M.)** | 3.1468 | |
| **Standard Deviation (SD)** | 1,264 | |

- **Question 3:** How strongly do the following factors influence the positive evaluation of your participation in a running race?

The third question assessed how strongly ecological actions positively influence participants' perceptions of participating in a running event. Participants were also asked to respond to this question on a 5-point Likert scale (1 = Not at all strongly, 5 = Very strongly).

From the descriptive statistics with absolute and relative values (percentages of responses), it was observed that most participants do not show particular interest in the participation of distinguished runners in the event, with a total of 72.5% showing no or little interest, for the image of the sponsors with 58.3% no or little interest. They show moderate interest in social commitment, with 48% very and very interested, and in the size of the event, with 45.9% very and very interested. The elements considered most important for the positive evaluation of an amateur running event by the participants are the good organization of the race with the highest percentage of 85.3% very and exciting, the good atmosphere 84.7%, the route with 79.5% very and very interesting, the attractive city with 69.4% very and very interesting and the proximity of the place of residence in relation to the event with 65.5% very and very interesting. Finally, ecological activities are slightly above the average in the preference of the participants, with 52.9% very and very interesting (Table 8).

**Table 8:** Absolute and Relative Frequencies of Factors Affecting Positive Evaluation for Participation in Running Events

| | **No at all** | | | | | | | | **Very Strongly** | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % | N | % |
| Elite Runners | 152 | 46.5 | 85 | 26 | 58 | 17.7 | 22 | 6.7 | 10 | 3.1 |
| Sponsor Image | 109 | 33.3 | 85 | 26 | 92 | 28.1 | 34 | 10.4 | 7 | 2.1 |
| Voluntary Social Commitment | 28 | 8.6 | 52 | 15.9 | 90 | 27.5 | 114 | 34.9 | 43 | 13.1 |
| Participation Fee | 15 | 4.6 | 36 | 11 | 70 | 21.4 | 129 | 39.4 | 77 | 23.5 |
| Social Program | 28 | 8.6 | 40 | 12.2 | 92 | 28.1 | 121 | 37 | 46 | 14.1 |
| Ecological Activities | 27 | 8.3 | 46 | 14.1 | 81 | 24.8 | 119 | 36.4 | 54 | 16.5 |
| Event Size | 31 | 9.5 | 57 | 17.4 | 89 | 27.2 | 117 | 35.8 | 33 | 10.1 |
| Proximity to Residence | 20 | 6.1 | 32 | 9.8 | 59 | 18 | 100 | 30.6 | 116 | 35.5 |
| Attractive City | 21 | 6.4 | 24 | 7.3 | 60 | 18.3 | 139 | 42.5 | 83 | 25.4 |
| Route | 10 | 3.1 | 8 | 2.4 | 49 | 15 | 101 | 30.9 | 159 | 48.6 |
| Good Atmosphere | 8 | 2.4 | 7 | 2.1 | 35 | 10.7 | 125 | 38.2 | 152 | 46.5 |
| Good Organization | 8 | 2.4 | 7 | 2.1 | 33 | 10.1 | 101 | 30.9 | 178 | 54.4 |

Correspondingly, in terms of averages, the results of this research showed that the most important factors for a positive evaluation of an event concern Good Organization (*M.* = 4.33), Good Atmosphere (*M.* = 4.24), and Route (*M.* = 4.20). The question of including Ecological Activities during the event is slightly below the average of preferences (*M.* = 3.39) (Figure 1).

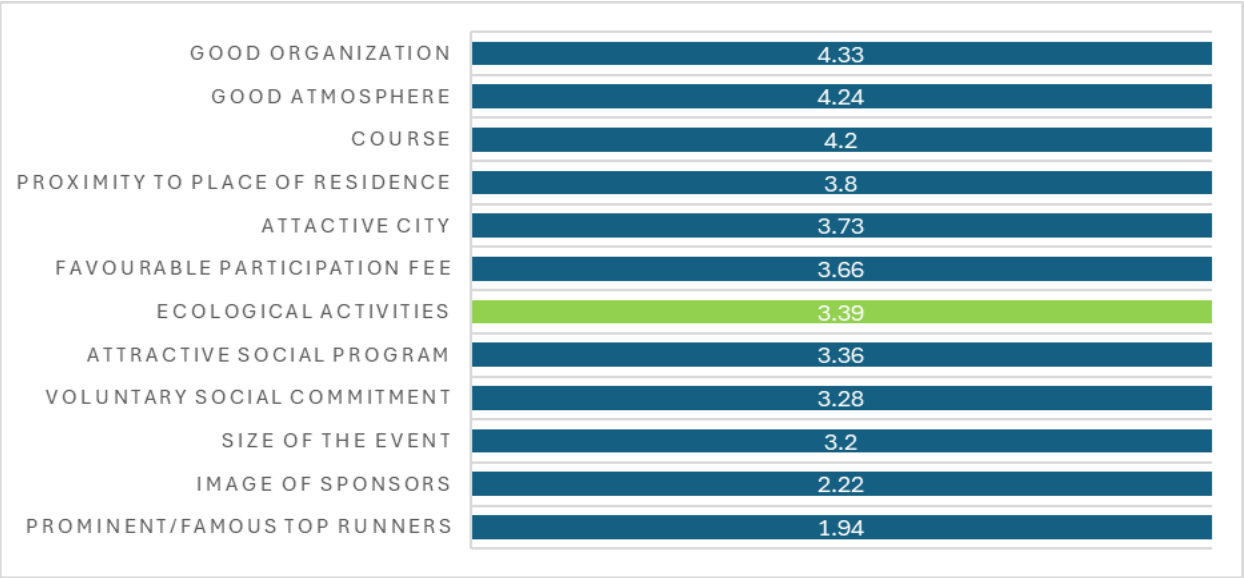


**Figure 1:** WTP for Factors' Influence on Positive Assessment of a Race Event

- **Question 4:** If you are considering purchasing an environmentally friendly product, which statement describes you better?

The fourth question was formulated to investigate in depth the willingness to pay a financial price for the purchase of an environmentally friendly product by the participants, as an expression of their environmental awareness and preference,

integrated into the overall purchasing decision-making process. This focus concerns the assessment of the value that consumers attribute to the environmental friendliness of the products and services they choose to purchase, taking into account the increased costs that may be involved in adopting environmentally friendly practices and choices. This approach is based on theoretical foundations from the theory of consumer behavior and environmental economics, with the aim of better understanding the factors that influence purchasing preferences in relation to sustainability.

The descriptive results of the question showed that the majority of participants buy environmentally friendly products if they are not more expensive (N = 216, 66.1%), or regardless of price (N = 38, 11.6), giving a positive overall intention to purchase environmentally friendly products overall (N = 254, 77.7%) (Table 9).

**Table 9:** Absolute and Relative Frequencies of Environmental Attitudes towards Buying an Environmentally Friendly Product

| | N | % |
|---|---|---|
| I don't buy environmentally friendly products. | 8 | 2.4% |
| I always buy the cheapest option. | 13 | 4.0% |
| I prefer environmentally friendly products, but they are too expensive for me. | 38 | 11.6% |
| I buy environmentally friendly products, if they are not more expensive | 216 | 66.1% |
| I buy environmentally friendly products, even if they are more expensive. | 38 | 11.6% |
| I don't know/no answer | 14 | 4.3% |

Regarding the independent variable of gender, no relationship was observed with the dependent variable of product market ($\chi^2_{(5,327)} = 4.591$, $p = .468$), similarly regarding the level of education ($\chi^2_{(20,327)} = 29.683$, $p = .075$) and regarding the independent variable of marathon runner status ($\chi^2_{(5,327)} = 6.946$, $p = .225$). On the contrary, a statistically significant relationship was observed with respect to marital status ($\chi^2_{(20,327)} = 33{,}097$, $p = .033$), income ($\chi^2_{(30,327)} = 44{,}780$, $p = .040$), and occupation ($\chi^2_{(20,327)} = 44{,}968$, $p < .001$).

When testing for possible differences between the means of the different levels of the independent variables with respect to the mean of the dependent variable, the following results were observed: Regarding gender, no statistically significant difference was observed between the means of the groups ($t_{(325)} = -.649$, $p = .256$) and the status of marathon runners ($t_{(147.829)} = 1.655$, $p = .100$), using the statistical criterion *t*-test for independent samples. Also, no statistically significant differences were observed between the means of the individual groups in terms of family status ($F_{(4,322)} = 1.033$, $p = .390$), education level ($F_{(4,322)} = 1.445$, $p = .115$), and income ($F_{(6,320)} = 1.400$, $p = .214$). In contrast, statistically significant differences were observed in terms of occupation ($F_{(4,322)} = 2.995$, $p = .019$). In contrast, in the pairwise test with the Bonferroni correction, statistically significant differences were observed between the group without professional employment and the group of private employees ($p = .48$) and between the group without professional employment and the group of freelancers ($p = .034$).

- **Question 5:** Which of the following initiatives would you be willing or unwilling to pay an additional amount for upon registering for the event?

The fourth question aimed to explore the specific factors related exclusively to the organization of road races, for which participants would be willing to pay an increased financial participation fee. During the process of formulating the multiple-choice list, three factors were selected that are considered critical for promoting environmental sustainability in road sports events. These include the use of organic products, rational waste sorting and management, as well as a significant reduction in the use of single-use plastic materials. These factors were selected based on scientific literature and best practices for reducing the environmental footprint of mass sports events.

The average of the responses regarding the initiatives for which a runner would be willing to pay an additional amount for sustainable environmental actions was *M.* = 3.48 (*SD* = .83). When investigating the averages of the individual initiatives, as they were posed as a question, it was observed that five out of the total 15, which concerned environmental sustainability factors, presented higher averages than the overall average. Specifically, Waste Management Optimization (*M.* = 4.02) ranks first among all questions with the highest average, Plastic Use Reduction (*M.* = 3.83) ranks second, $CO_2$ Emissions Reduction (*M.* = 33.7) ranks third, Green Energy Use (*M.* = 3.68) ranks fifth, and the Most Sustainable Promotional Product (*M.* = 3.58) ranks eighth and above average. More Organic Products (*M.* = 3.44) ranks tenth, while Water Consumption Reduction ranks twelfth (*M.* = 3.27).

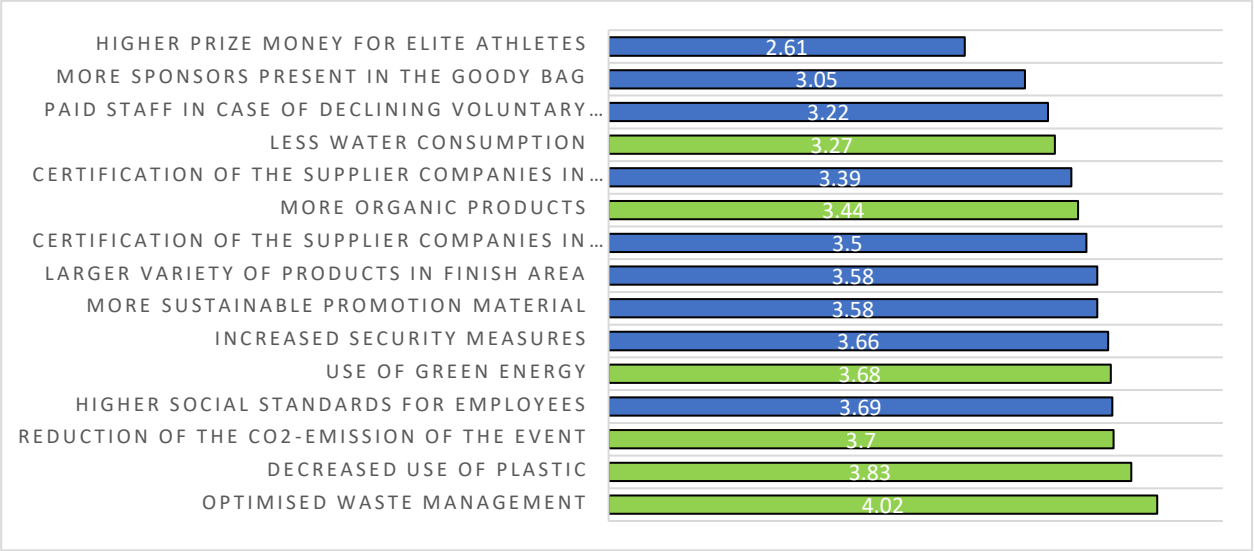


**Figure 2:** Mean WTP for Environmental Initiatives when participating in Running Events

Specifically, about the independent variables, the following results were observed. Statistically significant differences were observed in terms of gender and the reduction of plastic use ($\chi^2_{(4,327)} = 23{,}844$, $p < .001$), the optimization of waste management ($\chi^2_{(4,327)} = 20{,}994$, $p < .001$), the use of green energy ($\chi^2_{(4,327)} = 27{,}484$, $p < .001$), the sustainable promotional product ($\chi^2_{(4,327)} = 19{,}414$, $p < .001$), the reduction of $CO_2$ ($\chi^2_{(4,327)} = 19{,}101$, $p <$

.001), the certification of environmental standards ($\chi^2_{(4,327)}$ = 11,746, $p$ = .019), the reduction of water consumption ($\chi^2_{(4,327)}$ = 15,586, $p$ = .004) and for ensuring social standards for employees ($\chi^2_{(4,327)}$ = 13,692, $p$ = .008), while no statistically significant gender differences were shown in terms of increasing safety measures ($\chi^2_{(4,327)}$ = 3,206, $p$ = .524), certification of social standards ($\chi^2_{(4,327)}$ = 7,412, $p$ = .116), the existence of hired personnel ($\chi^2_{(4,327)}$ = 9,349, $p$ = .053), most organic products ($\chi^2_{(4,327)}$ = 8,763, $p$ = .067), the variety of products at the termination ($\chi^2_{(4,327)}$ = 6,575, $p$ = .160), the existence more sponsors in the race bag of the race ($\chi^2_{(4,327)}$ = 7.385, $p$ = .117) and the highest prize money for elite athletes ($\chi^2_{(4,327)}$ = 5.741, $p$ = .219). Regarding income, a statistically significant difference was observed only in terms of the reduction in plastic use ($\chi^2_{(24,327)}$ = 46.025, $p$ = .004). Regarding the status of marathon runner, a statistically significant difference was observed only in terms of the variety of products at the finish ($\chi^2_{(4,327)}$ = 10.366, $p$ = .035). Regarding the independent variables of family status, level of education, and professional employment, no statistically significant difference was observed in terms of the dependent variables.

## 5. Recommendations

This study's main finding is that amateur runners in Greece show a positive but modest WTP for environmental initiatives at running events. The mean additional payment (€7.32) and mean percentage (1.19%) indicate that participants are willing to shoulder a small extra cost for sustainability. These magnitudes align with evidence from other contexts where WTP is positive but bounded (Könecke *et al.*, 2021; Ribet & Brander, 2020). For event organizers considering adding a sustainability surcharge or reallocating part of registration fees to green measures, the results suggest feasibility: modest per-entrant contributions could generate funds for waste management, reusable cup systems, improved transport coordination, and other cost-effective measures. However, transparent communication about how funds are used and visible impacts are essential to maintain participants' support (Harrison *et al.*, 2022; Gionfriddo *et al.*, 2023).

Governing bodies such as the IOC and World Athletics are advancing event sustainability standards; integrating participant-funded components could complement broader policy tools (IOC, 2021; World Athletics, 2024). Future research should use representative sampling and experimental choice methods to estimate marginal WTP for specific attributes and to explore causal drivers such as motivational factors, perceived service quality, and trust in event organizers.

## 6. Conclusion

The present study provides the first quantitative estimate of Greek amateur runners' WTP for environmentally sustainable initiatives in running events. Participants exhibited a generally positive disposition to contribute modest amounts, with important practical implications for event financing and sustainability planning. While promising, findings

derive from a convenience snowball sample and should be confirmed with larger, probability-based samples and experimental designs.



**Conflict of Interest Statement**
The authors declare no conflicts of interest.

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