

Research Article

# Metal Meets Green: A Multifaceted Exploration of Sustainability Perceptions at Heavy Metal Music Festivals

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## Abstract

The enduring presence of heavy metal music spanning multiple decades has generated a large global audience of devoted fans. Within Europe, renowned metal music festivals such as Wacken Open Air and Rock am Ring in Germany have solidified the genre's influence. Although scholarly research has explored metal music festivals and their attendees, there has been a noticeable gap in the examination of sustainability aspects within this domain. Consequently, this work undertakes a quantitative investigation into the social, environmental, and economic impacts within the context of metal music festivals, focusing on four key stakeholder groups: festival organizers, attendees, musicians, and volunteer workers (n = 742). To gain insights, an online survey was conducted to respondents, presenting them with questions pertaining to various aspects of environmental, social, and economic sustainability. These stakeholders were asked to assess these issues based on their individual perspectives. Subsequently, the collected data underwent explorative factor analysis utilizing maximum likelihood estimation, leading to the identification of eight distinct factors: perceptions of social behavior at metal music festivals, environmental responsibility, financial responsibility, environmental and social responsibility, sense of community, environmental and economic impacts, perceptions of volunteer work, and economic impacts. This study's findings revealed noteworthy disparities across all sectors, offering a comprehensive perspective on current sustainability practices and challenges within metal music festivals. By highlighting inconsistencies, this research underscores the need for festival organizers to critically evaluate their events and consider avenues for improvement in sustainability practices.

## Keywords

Sustainability, Festivals, Events, Metal

## 1. Introduction

The popularity of heavy metal music and its scene has grown significantly over the past years, gaining the respect and credit it deserves. Streaming numbers indicate a global

increase in heavy metal music streaming, reflecting its growing fanbase worldwide [1]. As heavy metal music festivals have embraced sustainable practices, it is essential to

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understand how different stakeholder groups perceive sustainability in this context. This study aims to explore the perception of social, environmental, and economic sustainability practices at metal music festivals among festival organizers, attendees, musicians, and volunteers.

This study addresses a research gap in academic literature that connects metal music festivals with sustainability practices. While research on sustainability at music festivals exists, studies specific to metal music festivals are limited [2-4]. Moreover, existing studies primarily focus on attendee behavior, excluding other stakeholder groups. This research aims to provide insights into stakeholder perceptions and contribute to the understanding of sustainability practices within the heavy metal scene.

This quantitative work collects data from four stakeholder groups: festival organizers, attendees, musicians, and volunteers. Two sets of questionnaires were developed, tailored to the specific roles and perspectives of each group. The surveys gathered data on the stakeholders' perception of social, environmental, and economic sustainability practices at their last attended metal music festival in German-speaking areas. The collected responses were analyzed using the statistical software SPSS, and the findings were discussed in detail.

The primary aim of this study is to explore the perception of sustainability practices at metal music festivals among different stakeholder groups with the following research question:

RQ: How does the perception of social, environmental, and economic sustainability practices at metal music festivals differ among selected stakeholder groups?

The research question was investigated by employing the following sub questions in order to examine the RQ in greater depth:

SQ1: What are the significant differences in the stakeholder's perceptions regarding the environmental impact at metal music festivals, more precisely waste management?

SQ2: What are the stakeholder's perceptions regarding social interactions and the inclusion of all participants at metal music festivals?

SQ3: How do the stakeholder groups perceive economic aspects typically associated with music festivals, such as (local) community support, pay gaps among musicians and bands, and the use of generated profits?

The study seeks to fill the research gap by analyzing the data and providing insights into stakeholder perceptions of sustainability practices at metal music festivals, contributing to the scientific discourse in this field.

A further aim of the study is to address the research gap in academic literature by exploring the perception of sustainability practices at metal music festivals among festival organizers, attendees, musicians, and volunteers. By gathering data through quantitative surveys, the research aims to provide valuable insights into stakeholder perceptions regarding social, environmental, and economic sustainability practices. The findings of this study will help festival organizers better

understand their target audiences, critically evaluate their sustainability practices, and make necessary adjustments. Ultimately, this research contributes to a deeper understanding of sustainability in the heavy metal music festival context.

## 2. Literature Review & Theoretical Base

### 2.1. Perception

Human perception has been extensively researched in fields like psychology, philosophy, and metaphysics [5]. It is an interpretative process influenced by personal experiences, values, and beliefs [6]. The senses, including vision, sound, smell, and taste, play a vital role in shaping perception and exploring the environment [5].

Perception and music are intertwined, with studies focusing on music's emotional stimulation and impact on the brain [7, 8]. Music festival perception extends beyond audio-visual experiences, encompassing actions and social aspects [9]. Perception of sustainability at music festivals is also crucial, with a disconnect observed between participant desires and actual implementation by organizers [10].

Sustainability perception has been extensively researched, with studied subjects recognizing its relevance and expressing concerns about the future due to climate change [11]. Despite awareness, cognitive dissonance may lead to a misalignment between perception and behavior [12].

### 2.2. Event & Festival Management

Music festivals are a type of event that differs from concerts in that they feature multiple artists and musicians within a selected theme or genre [13, 14]. They provide a unique experience for attendees and often include various activities beyond music [15]. Music festivals are defined as events consisting of multiple live music performances that are presented as a whole and valued by audiences [14].

Sustainability and sustainable event management have gained recognition in the field of events and festivals. The concept of sustainability involves considering the social, environmental, and economic implications of events [16]. However, many events and festivals tend to focus on only one aspect of sustainability, often neglecting the holistic view [17].

The Economy for the Common Good (ECG) offers an alternative economic model that emphasizes the common good as its primary goal [18, 19]. The ECG provides a matrix for organizations to assess their contributions to the common good based on values such as human dignity, solidarity, environmental sustainability, transparency, and stakeholder groups. This matrix can be used to evaluate and measure the sustainability practices of organizations, including events and festivals.

### 2.3. The Impact of Music Festivals

Examined next is an overview of the environmental, social, and economic impacts of music festivals, specifically focusing on metal music festivals. Sustainability encompasses social, environmental, and economic aspects, and the Economy for the Common Good (ECG) offers an alternative economic model that prioritizes the common good [18, 19]. The ECG's Common Good Matrix assesses organizations' contributions to the common good based on values like human dignity, environmental sustainability, and transparency.

Environmental impacts of festivals include waste management, resource use, energy supply, and greenhouse gas emissions. While waste disposal is a visible aspect, resource use, energy supply, and greenhouse gas emissions may be less noticeable [20, 21]. Sustainable food options, food waste reduction, and circular economy concepts are important considerations in the context of festival food and beverages [16].

Social impacts of festivals encompass both negative and positive effects on local communities, including noise, overcrowding, higher prices, job opportunities, and community development [22]. Metal music festivals foster a strong sense of community among attendees [23, 3]. Inclusion, equality, fair treatment of participants, volunteers, and musicians are essential aspects of social sustainability [24-26].

Economic impacts of festivals involve employment, tourism, and revenue generation. Festivals contribute to the local economy through job creation and income generation [22]. Sound Diplomacy's study highlights the economic impact of live music events and venues in various German cities. However, the distribution of revenues within the music industry and the income of musicians are complex issues [27]. Gender inequality and the gender pay gap are significant concerns in the music industry.

### 2.4. Stakeholders at Metal Music Festivals

Stakeholders are defined as groups or individuals who can affect or are affected by the achievement of a corporation's purpose [28]. Two frameworks are used to categorize stakeholders: one by Van Niekerk and Getz (2015) [29], focusing on a holistic approach, and another by the Economy for the Common Good (ECG) [18], which identifies five crucial stakeholder groups.

The four selected stakeholder groups for this study are festival attendees, festival organizers, musicians, and volunteers. For festival attendees, the perception of social sustainability is influenced by factors such as a sense of belonging, bonding, and community [30]. Waste management and social interaction with other participants are key factors for their sustainability perception [20].

Festival organizers face challenges in social sustainability,

including gender inequality, the gender pay gap, and accessibility. Some organizers have implemented strategies to address these issues [31]. Limited research exists on organizers' perception of environmental and economic sustainability [32].

Musicians, as suppliers, have diverse perspectives on sustainability, but their focus may be more on economic sustainability due to the profitability of touring and playing festivals [33, 34]. While literature on musicians' perception of sustainability is limited, some bands address environmental issues in their songs [35].

Volunteers play a crucial role in festivals, and their motivation stems from connections with other volunteers and a sense of community [36]. Perceived organizational support contributes to their commitment and sense of value [37].

In all, research on stakeholders' perceptions of sustainability at metal music festivals is limited, particularly regarding musicians and volunteers. Existing studies highlight the importance of social factors for festival attendees and the need for festival organizers to address social sustainability challenges. The empirical part of this study aims to explore the research gaps identified.

### 2.5. Theoretical Base

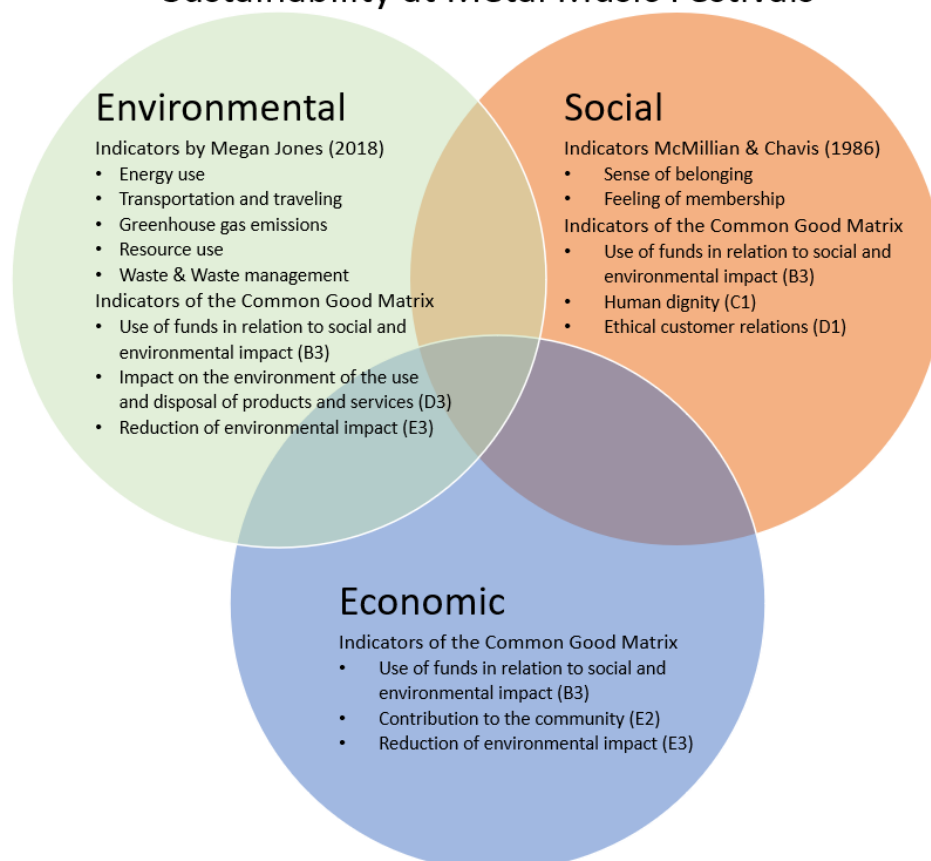
The theoretical framework for the empirical research focuses on the sustainability perception of stakeholders. The Economy for the Common Good's Common Good Matrix [18] and selected indicators include:

1. Indicator B3 (use of funds in relation to social and environmental impacts)
2. Indicator C1 (human dignity in the workplace and working environment)
3. Indicator D1 (ethical customer relations)
4. Indicator D3 (impact on the environment of product and service use and disposal)
5. Indicator E2 (contribution to the community)
6. Indicator E3 (reduction of environmental impact)

The Sense of Community model is also used to assess social sustainability, with a focus on the sense of membership and belonging at metal music festivals [16]. The empirical research will evaluate sustainability commitment, energy usage, transportation, greenhouse gas emissions, resource use, waste management, and attendee engagement.

The three frameworks—Common Good Matrix, Sense of Community, and sustainability indicators by Meegan Jones—are interconnected to provide a comprehensive understanding of social, environmental, and economic sustainability at music festivals. These frameworks complement each other and form the foundation for answering the research questions of the thesis. The illustration in the text depicts the interconnected pillars and indicator.

## Sustainability at Metal Music Festivals



*Figure 1. Spheres of Sustainability at Metal Music Festivals.*

### 3. Method

This study utilizes a survey questionnaire and incorporates deductive and inductive designs, as some items in the questionnaire have not been explored in the context of music festivals but were considered important based on prior observations by the researcher.

The survey design incorporated various scales to measure the perception, awareness, and consciousness of the target group. The Likert scale, a commonly used scale, was employed to assess perceptions and attitudes towards different aspects. Semantic differential scales, using bipolar statements, were also utilized to gain insights into stakeholder group perceptions. Filter questions were included at the beginning of the questionnaire to determine respondents' eligibility and ensure appropriate insight into the subject.

The questionnaire was divided into three sections: environmental, social, and economic sustainability. These sections aligned with the theoretical framework and drew from a questionnaire developed by Gericke et al. in 2018 [38]. The survey items were tailored to each stakeholder group, including attendees, volunteers, organizers, and musicians associated with metal music festivals in the German-speaking areas.

A non-probability sampling technique was chosen due to the difficulty in determining the exact population size and sample size. The target group consisted of metal music festival stakeholders from Germany, Austria, and Switzerland. Purposive sampling was used to select platforms for sharing the questionnaires, primarily relying on social media networking sites such as Facebook and Instagram. The snowball sampling technique was employed within relevant metal music groups to reach potential respondents.

The research employed a cross-sectional time horizon, collecting data from individuals who had participated in at least one multi-day metal music festival in the German-speaking area within the past five years.

Data analysis was conducted using IBM SPSS Statistics. Descriptive statistics were generated for socio-demographic data, and frequency distributions were created to assess respondents' perceptions of sustainability. The main analysis involved a Factor Analysis using Maximum Likelihood Estimation and Kruskal-Wallis tests to identify differences in perceptions among stakeholder groups. Reliability tests were performed using Cronbach's alpha method to assess the internal consistency of the scales.

To ensure the quality of the measurement tool, objectivity, reliability, and validity criteria were considered. Objectivity was achieved through standardized survey questions and clear

instructions for response coding. Reliability was assessed using Cronbach's alpha, with acceptable values ranging from 0.70 to 0.95. Validity was addressed through content validity, criterion validity, and construct validity, ensuring the survey items accurately measured the intended constructs.

## 4. Results

The results presented in this section stem from a statistical analysis of the accumulated data. This began with an exploration of the preliminary analysis, followed by a review of the statistics most relevant to the key stakeholders involved. Subsequently, the primary outcomes of the survey are outlined, complemented by tables where appropriate.

As highlighted earlier, a slightly modified questionnaire was administered to the festival organizers compared to the other three stakeholder groups, tailoring it to align more closely with the specificities of their festival scenario. Nevertheless, it was ensured that the central content of the questionnaire remained uniform across all variants, a strategy devised to preserve the standardization of the items and to facilitate the derivation of reliable results.

### 4.1. Stakeholder Demographics

Out of 742 respondents, the majority were men, comprising 63.88%. The predominant age group was 30–45 years, accounting for 56.20%. German nationals formed the largest group with 73.05%, and a significant portion held college degrees, tallying at 46.36%. The primary employment status was being an employee or worker, represented by 75.34%.

**Table 1.** Sociodemographic Characteristics of Respondents (based on survey results).

n = 742		
Gender	Male	63.88%
	Female	35.44%
	Diverse	0.67%
Age Groups	< 18 years	0.13%
	18 to 29 years	19.41%
	30 to 45 years	56.20%
	46 to 65 years	23.58%
	> 65 years	0.67%
Citizenship	Austrian	20.09%
	German	73.04%
	Swiss	2.06%
	Other	4.31%

n = 742

Highest Education Qualification	Mandatory School	1.62%
	Apprenticeship	14.69%
	Vocational Middle School	6.60%
	General Secondary School	12.26%
	Vocational High School	15.90%
	College	46.36%
	Other	2.56%
	Musician	4.04%
Current Occupation /Education	Pupil	0.67%
	Apprentice	0.81%
	Student	5.12%
	Employee; Worker	75.34%
	Self-employed	8.49%
	Unemployed / job seeker	1.48%

Concerning festival organizers (N=77), the majority (77.92%) reported an average attendance of fewer than 5,000 people at their events. The survey included detailed demographic data, including gender, age, nationality, educational attainment, and employment status, offering a comprehensive view of the participant profile, as further outlined in the accompanying table.

**Table 2.** Average Number of Attendees at Festival (based on survey results).

n = 77	
Less than 5,000	77.92%
5,000 – 10,000	9.09%
10,000 – 25,000	5.19%
>25,000	7.79%

In the most recent metal music festival they attended in a German-speaking region, different stakeholder groups reported varying attendance sizes. Nearly half of the general attendees had been to a festival hosting over 25,000 people. Contrastingly, most musicians, comprising 58.68%, last showcased their talent at events with fewer than 5,000 attendees. Volunteers' experiences were fairly evenly distributed, with a slight majority having worked at events with less than 5,000 attendees, followed closely by those who volunteered at venues with more than 25,000 attendees.



## 4.2. Perception of Sustainability in General

In the survey's first segment (n=742), participants rated their views on everyday environmental sustainability using a five-point Likert scale. The internal reliability, assessed through Cronbach's Alpha, exhibited scores of 0.852, 0.869, and 0.597 for environmental, social, and economic sustainability perceptions respectively.

Responses demonstrated considerable consensus, notably in environmental sustainability, with many affirming the integral role of waste management in sustainability.

Additionally, the survey introduced lesser-acknowledged sustainability elements such as education, peace work, and biodiversity. While about 40% remained neutral towards education and peace work, potentially indicating unfamiliarity with their relevance in sustainability, biodiversity found greater acceptance, highlighting its established place in discussions on sustainability.

## 4.3. Perception of Sustainability at Metal Music Festivals

The survey asked respondents to rate daily sustainability aspects within the setting of metal music festivals using a 1 to 5-point Likert scale. Cronbach's Alpha calculated scores of 0.877, 0.644, and 0.714 for environmental, social, and economic sustainability, respectively, displaying noticeable parallelisms with everyday context responses.

nominal sustainability, respectively, displaying noticeable parallelisms with everyday context responses.

The primary segment of the survey presented 42 paired statements on a Likert-type scale, exploring participants' sustainability perspectives. The pivotal part of the study involved a factor analysis executed through maximum likelihood estimation (MLE) integrated with Kruskal-Wallis tests to discern perceptual variations among stakeholders. This employed Varimax Rotation and Kaiser Normalization, crystallizing into eight distinct, primarily self-derived categories that echoed the tenets of the Common Good Matrix, emphasizing varied perceptions like environmental awareness at festivals.

The MLE outlined in the accompanying table elucidated 44.76% of the total variance, assigning items to categories based on a dominant factor scoring at least 0.3. This analysis, backed by a substantial sample size, incorporated items with scores between 0.3 and 0.4, aligning with guidance from Field (2013) [39].

This approach led to the elimination of two items and the retention of 42 queries probing diverse sustainability aspects. Ensuring robustness, the study adapted based on Cronbach's Alpha feedback, improving the "Sense of Community" factor's reliability by omitting one item, and disregarding the economic impact dimension due to inadequate reliability, adhering to standards referenced in Field (2013) [39].

**Table 3.** Results of Factor Analysis with Maximum Likelihood Estimation based on results).

	Mean	Mean per Stakeholder Group SH 1   SH 2   SH 3   SH 4	Loading Factor	Variance Explained %	Cronbach's Alpha
1. Perception of Social Behavior at Metal Music Festivals <i>n</i> = 540	4.08			9.27	0.826
Male – female treatment		4.02   3.67   3.75   4.03	0.42		
Inclusion – gender	3.74	n.a.   4.28   4.23   4.32	0.76		
Inclusion - harassment	4.27	n.a.   3.55   3.8   3.56	0.55		
Inclusion – age	3.59	n.a.   4.34   4.16   4.59	0.86		
Inclusion – disabilities	4.33	n.a.   4.46   4.45   4.47	0.81		
Work distribution	4.46	n.a.   3.70   3.79   4.39	0.5		
	3.76				
2. Perception of Environmental Responsibility <i>n</i> = 638	2.96			17.28	0.767
Abundance of resources		n.a.   3.07   3.11   3.14	0.39		
Garbage disposal	3.08	n.a.   4.19   3.75   4.26	0.37		
Waste separation	4.12	n.a.   2.53   2.24   2.67	0.86		
Waste avoidance	2.49	n.a.   2.57   2.44   2.92	0.78		

	Mean	Mean per Stakeholder Group SH 1   SH 2   SH 3   SH 4	Loading Factor	Variance Explained %	Cronbach's Alpha
Packaging waste	2.57	n.a.   3.07   2.93   3.08	0.6		
Recycling	3.05	n.a.   3.19   3.04   3.28	0.44		
Type of power source	3.17	n.a.   2.29   2.11   2.03	0.36		
	2.24				
3. Perception of Financial Responsibility <i>n</i> = 706	4.06			23.1	0.734
Creation of temporary jobs					
Support of local economy	3.95	3.76   4.03   3.76   3.70	0.67		
Support of local infrastructure	4.21	4.40   4.20   4.10   4.30	0.82		
Financial engagement in cultural sector	4	4.15   3.99   3.93   4.09	0.72		
	4.05	4.23   4.05   3.86   4.29	0.33		
4. Environmental & Social Responsibility of Metal Music Festivals <i>n</i> = 705	3.01			28	0.707
Many male musicians in line-up					
Engagement in ecological field					
Use of profits to support sustainable projects	3.17	n.a.   3.26   2.84   3.10	0.34		
	2.97	2.90   3.05   2.73   2.71	0.77		
	3.16	3.32   3.20   2.95   3.00	0.75		
5. Sense of Community <i>n</i> = 539	4.38			32.53	0.709
		n.a.   4.47   4.21   4.66	0.78		
Connection through shared exp.	4.44	n.a.   4.46   4.10   4.52	0.87		
Belonging to a social group	4.4				
6. Environmental & Economic Impacts of Metal Music Festivals <i>n</i> = 707	3.36			36.94	0.623
Power source impact		n.a.   3.55   3.25   3.34	0.81		
Produced emissions at festival	3.52	3.44   3.54   3.33   3.68	0.57		
	3.5	3.53   3.68   3.52   3.54	0.4		
Pay-Gap amongst musicians					
Male musicians earn more than females	3.63	2.72   3.11   2.51   2.89	0.38		
	2.97				
7. Perception of Volunteer Work <i>n</i> = 715	3.44			41.21	0.681
		n.a. 3.32   3.24   3.54	0.34		
Locally sourced food	3.32	n.a.   3.27   3.63   3.65	0.44		
Private vehicles musicians	3.36	4.35   4.01   3.92   4.38	0.48		

	Mean	Mean per Stakeholder Group				Loading Factor	Variance Explained %	Cronbach's Alpha
		SH 1	SH 2	SH 3	SH 4			
Volunteer work problem	4.05	3.81	3.47	3.33	3.79	0.42		
Volunteer value	3.5	3.00	2.99	2.77	3.39	0.43		
Compensation volunteers	2.98							
8. Economic Impacts of Metal Music Festivals	3.67						44.76	0.445
<i>n</i> = 622								
Pay gap bands		3.33	3.07	3.21	3.29	0.38		
Impact on income sit. of bands	3.13	3.92	3.79	3.97	3.68	0.62		
Many small bands live in difficult income situations	3.83	3.98	4.06	4.19	3.82	0.56		
	4.06							

SH 1 = Festival Organizers | SH 2 = Attendees | SH 3 = Musicians | SH 4 = Volunteers

FA 7 incorporated elements related to both environmental sustainability and the financial and social dimensions of volunteer work. To maintain focus, it was decided to exclude two items pertaining to environmental sustainability from further scrutiny. The variation in items shown to organizers - albeit conveying the same essence - necessitated excluding certain items from the factor analysis due to a small sample size of 77 responses, retaining only those that were unchanged.

Kruskal-Wallis tests applied to discern the perceptual differences across four stakeholder groups unveiled significant disparities in six out of the eight dimensions analyzed. This method delineated distinct subsets, spotlighting variations in stakeholders' perceptions, with some groups showing no notable differences but markedly differing from others in alternate subsets. For instance, while the festival organizers' perceptions diverged substantially from the musicians, they largely aligned with the views of attendees and volunteers.

Furthermore, to facilitate a comparative analysis of the organizers' responses with other groups, additional variables aligned with identified factors were created based on the frequency distributions of the missing MLE items, named consistently for comprehension ease.

Significantly, a higher mean in FA 1, associated with the "Perception of Social Behavior at Metal Music Festivals," hinted at a differential perception by the organizers compared to other stakeholders. This suggestive trend warrants a deeper exploration to highlight the nuanced viewpoints held by different groups regarding the festival's social dynamics. Future analyses will explore this phenomenon alongside other notable findings from the factor analysis and homogenous subsets, guiding a detailed interpretation rooted in the research questions at hand.

## 5. Discussion

This study explores the divergent perceptions of sustainability practices at metal music festivals across four stakeholder groups. Leveraging insights from the Common Good Matrix, Meegan Jones' guidelines for sustainable events, and McMillan and Chavis' Sense of Community theory, it delves deep into specific sustainability pillars explained in the literature review. By narrowing down to specific aspects through sub-research questions, the study aims to provide more exact results and effectively address the primary research question.

### 5.1. Interpretation of Results

This section delineates the varied perceptions stakeholders hold regarding sustainability practices, linking them with academic literature and established theoretical frameworks. It aims to spotlight significant similarities or differences in stakeholder views, guided by the central research questions outlined earlier. Given the intertwined nature of environmental, social, and economic dimensions of sustainability, the discourse recognizes the possibility of overlapping insights in response to the research inquiries, a complexity echoed in the factor analysis results.

SQ1: What are the significant differences in the stakeholder's perceptions regarding the environmental impact at metal music festivals, more precisely waste management?

The MLE pinpointed specific factors - FA2, FA4, and FA6 - relating to perceptions of environmental responsibility and impacts. The Kruskal-Wallis test revealed that attendees, musicians, and volunteers shared similar perspectives on FA2, displaying a moderate consensus on environmental responsibility levels, with a slightly higher acknowledgment from



organizers.

The disparities were most noticeable in areas of waste management, where responses diverged significantly on topics like garbage disposal and waste separation. A detailed look reveals a higher satisfaction level from the general stakeholders concerning waste disposal facilities, aligning with the discussions emphasized in Hazel and Mason's 2020 [24] study on the necessity of efficient waste management in maintaining a clean festival environment. However, organizers viewed it as a pressing issue, resonating with Julie's Bicycle's 2008 [44] study highlighting substantial waste generation at UK music festivals.

The low scores in waste separation and avoidance from both organizers and other stakeholders indicate a recognized gap in active waste reduction initiatives at these events. Interestingly, organizers feel a significant responsibility is on staff to encourage waste separation, a perspective not shared as strongly by other groups.

Analyzing recycling approaches through the lens of the Common Good Matrix and Jones' 2018 guidelines suggests a favorable tendency among organizers towards recyclable products and reduced packaging waste, a sentiment not reflected by other stakeholders who observed a prevalence of single-use packaging. These findings underscore the crucial role of sustainable practices in product use and disposal to minimize environmental impact, urging a shift towards recyclable solutions and reduced waste generation. The data gathered calls for a harmonized approach to elevating environmental stewardship at metal music festivals, inviting an inclusive dialogue among all stakeholder groups.

SQ2: What are the stakeholder's perceptions regarding social interactions and the inclusion of all participants at metal music festivals?

The discussion on the perceptions of social sustainability at metal music festivals reveals significant variations in stakeholder viewpoints. Male respondents dominate the survey, mirroring the metal scene's male prevalence noted in existing literature.

The MLE spotlighted two critical aspects: Social Behavior at Metal Music Festivals and Sense of Community, both receiving high mean scores, echoing McMillan & Chavis's (1986) [40] community sense model. However, while attendees, volunteers, and musicians largely agreed on the first aspect, divergences appeared regarding the Sense of Community, with musicians resonating less with the sense of belonging, possibly due to their limited festival participation.

A pronounced disparity surfaced in FA1, examining inclusion and fairness in various dimensions such as gender and disability. Despite the general positive outlook from three stakeholder groups, organizers perceived these aspects less favorably, pointing out a conflict in perceived inclusivity and flagging a potential research avenue. This discrepancy also indicates a shortfall in meeting the Common Good Matrix's inclusive aspirations, underscoring a significant gap in festival organizers' approach to ensuring inclusivity and openness

for all attendees, against a backdrop of generally positive participant experiences.

This study emphasizes the divergence in perception, especially between organizers and other groups, opening a path for more nuanced exploration into the actual versus perceived social sustainability at metal festivals, while also hinting at the deeper work needed to align the organizers' efforts with broader expectations and norms for inclusivity.

SQ3: How do the stakeholder groups perceive economic aspects typically associated with music festivals, such as (local) community support, pay gaps among musicians and bands, and the use of generated profits?

The MLE analysis highlighted four factors central to economic sustainability at metal music festivals, underscoring the intricate relationship between economic, social, and environmental sustainability pillars. These factors were revealed despite the topic having the fewest questionnaire items, underlining its significant role in the sector.

Key focus areas from the MLE included FA3, emphasizing economic responsibility, FA4, and FA6, detailing environmental and social responsibilities, and the impacts of festivals, respectively. These areas showcased stakeholder perspectives on festivals' economic duties towards local communities, a concept upheld by initiatives at Wacken Open Air and Greenfield Festival. Interestingly, despite different backgrounds, the perception of economic responsibility remained somewhat constant among attendees, musicians, and volunteers, diverging significantly only in organizers' and musicians' viewpoints on supporting local economies and cultural engagements.

Exploring equal pay, a facet of both economic and social sustainability, revealed contradictory stakeholder opinions. Despite a prevalent gender pay gap in the industry, stakeholders displayed a medium consensus on its justification, hinting at perceived income inequalities. Meanwhile, addressing environmental items noted in FA6 would exceed this study's scope but paves the way for future research.

Further, an examination of profit usage, covered in both FA3 and FA4, unveiled moderate stakeholder agreement on festivals supporting sustainable initiatives, albeit with reservations, likely arising from the sporadic implementation of such practices.

The study, while limited by the exclusion of FA8 due to reliability concerns, paints a rich picture of the sustainability landscape in metal music festivals, opening avenues for more targeted research in the future. It shows a growing consciousness about economic sustainability, albeit with areas, such as the use of profits for broader societal causes, still lacking unanimous support. It signifies an emergent awareness and presents a nuanced understanding of the complex dynamics at play in the context of sustainability in metal music festivals, a vital insight for shaping future strategies in the industry.

RQ: How does the perception of social, environmental, and economic sustainability practices at metal music festivals

differ among selected stakeholder groups?

The previous sub-questions delved deep into the sustainability elements in metal music festivals, illustrating the perceptions of four stakeholder groups. These elements were spotlighted due to their association with sustainability in events, particularly given their far-reaching impact on various stakeholders and the environment, as the literature review outlined. These sub-questions have also contributed to answering the main research question of the thesis.

A factor yet to be addressed is FA7 (Perception of Volunteer Work), which wasn't encompassed within the sub-research questions. Delving into this factor, it registers a medium-high mean score ( $M = 3.435$ ), revealing that stakeholders generally view it as neutral. However, stakeholder-group-specific differences emerge. The emphasis, for now, is on the perception of volunteer work. The most notable score revolved around whether volunteers enhance or hamper the work of employees in the music industry ( $M = 4.05$ ). Such a score validates the indispensable role volunteers play, echoing sentiments from literature such as Barron & Rihova, 2011 [36], Toraldo et al, 2018 [41], and McBey et al., 2017 [37].

The Kruskal-Wallis test, evaluating homogenous subsets, discerned clear perception variances among stakeholders. Internal stakeholders (organizers and volunteers) displayed a more valued perspective towards volunteer work than their external counterparts (musicians and attendees). Concerning volunteers' fair compensation, a consensus amongst stakeholder groups was elusive. Referring back to the Economy for the Common Good, it emphasizes a dignified, respectful, appreciative, and trust-based work environment. The stakeholders' feedback largely resonates with the ECG's ideals.

Factor analysis revealed the interdependencies of most dimensions, akin to the inherent interconnectedness of the three sustainability pillars [42]. Factors span across the three sustainability spheres, with some integrating several of them. Interestingly, the social sustainability dimensions recorded the lowest stakeholder response, indicating that the association between social sustainability elements and metal music festivals isn't strong.

Environmental responsibility (FA2) saw more stakeholder engagement. This emphasis on environmental concerns aligns with Kahneman's cognitive theories [43], which imply immediate, observable issues like festival waste have a lasting impression. Another pivotal environmental element is the type of power source utilized. Organizer perceptions starkly differed from other stakeholders in this context, suggesting a communication gap that needs addressing to ensure transparency on potential environmental impacts from energy consumption.

On the economic front, factors concerning economic responsibility saw substantial stakeholder engagement. This coincides with the ECG's E2 indicator, emphasizing the community's financial well-being.

Notably, the highest mean scores centered on social (FA1, FA5) and economic (FA3) sustainability. Contrastingly, the

lowest scores related to environmental and socio-environmental facets (FA2 and FA4), indicating stakeholders value social and economic sustainability but find fault in environmental practices. These sentiments echo the views of environmental researchers like Julie's Bicycle and Meegan Jones [44, 16]. Further practical implications will be elaborated upon in subsequent chapters.

Tying back to the concepts of perception, awareness, and consciousness explored earlier, this research offers rich insights. Active environmental awareness [45] combined with informed understanding is critical for valid survey responses [40]. Previous studies [10] suggest people have environmental sustainability awareness at music festivals, yet there's a notable gap in actionable measures, not necessarily a failure of organizers but aligning more with the theory of dissonance, which indicates a propensity to accept inconsistencies rather than challenge them [12, 46].

While some demarcation between internal and external stakeholder perceptions exists, a clear boundary is missing. What's evident is the divergent, sometimes conflicting, stakeholder views on environmental responsibility and inclusivity within metal music festival settings.

## 5.2. Managerial Implications

This study reveals that stakeholders in metal music festivals generally regard social and economic sustainability higher than environmental efforts, with a pronounced sense of community being a very visible feature. The findings highlight a road map for organizers to amplify sustainability actions, notably in perceivable domains like waste management and resource allocation, where significant differences in perception were noted.

A critical area for attention is environmental sustainability, with resource abundance, waste management strategies, and the choice of power source pinpointed as areas necessitating improvement. Jones (2018) [16] advocates for a forward-thinking approach, urging organizers to foresee the necessary resources to prevent surplus and favor recyclable or reusable items to avoid a linear product lifecycle. A substantial emphasis on effective waste management involves a circular approach to product usage, alongside fostering open lines of communication about waste disposal avenues, with a strong on-ground staff presence to facilitate accurate waste disposal.

Waste management intricately ties with the emission of greenhouse gases, an issue brought to the forefront by resource over-utilization and improper waste handling strategies. Identifying potential sources of emissions, such as diesel generators and transportation activities, and crafting strategies to mitigate them are vital steps in reducing a festival's carbon footprint.

In summation, the study underscores a vital avenue for growth in the metal music festival sphere, emphasizing the pressing need for bolstered environmental sustainability ini-

tiatives guided by careful planning and inclusive stakeholder engagement. It serves as an inspiration for action to usher in an era of heightened sustainable awareness and activity, encouraging a collaborative endeavor towards eco-friendliness while nurturing the intrinsic community spirit that characterizes metal music festivals.

## 6. Conclusions

This study explored the perceptions of different stakeholder groups regarding the socio-economic and environmental sustainability practices at metal music festivals. Leveraging an analytical approach grounded in the Common Good Matrix [18], the Sense of Community theory, and guidelines established by Meegan Jones (2018) [16], the research sought to unravel the underlying dimensions of sustainability perception through explorative factor analysis utilizing MLE.

Distributing surveys exclusively to festival organizers, attendees, musicians, and volunteers facilitated a deeper understanding of the eight identified factors influencing the stakeholder's perspectives on various sustainability facets, including volunteer work and social behavior at events. One critical finding was the significant disparity in the festival organizers' perception, notably in terms of social inclusion and environmental responsibility, compared to the other groups. Organizers viewed waste management as a pressing issue, assigning it as a volunteer's duty to foster waste segregation, a standpoint not fully shared by other stakeholders.

Furthermore, a contradiction emerged in the stakeholder's perception of the gender pay gap among musicians. While stakeholders generally didn't perceive a significant pay discrepancy between male and female artists, a deeper dive into the data revealed an acceptance of the existing gap, hinting at a latent acknowledgment of the disparity.

Looking forward, there is substantial ground for further research in this area. Future studies could extend to include other genres and encompass the perspectives of additional stakeholder groups such as community leaders and industry employees. Moreover, looking deeper into often overlooked issues like substance abuse at festivals, and examining correlations identified in untypical factors (FA7 & FA6) could offer more nuanced insights.

The study successfully bridges a critical research gap in the German-speaking regions, setting a solid foundation for subsequent studies. While a low reliability score hindered a comprehensive discussion on economic impacts, an examination in future research could illustrate the economic intricacies more effectively, further enriching the understanding of sustainability practices in the festival landscape and paving the way for a more inclusive and environmentally conscious festival environment.

## Abbreviations

ECG	Economy for the Common Good
MLE	Maximum Likelihood Estimation

## Conflicts of Interest

The authors declare no conflicts of interest.

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