

**EXPLORING THE AWARENESS
OF NET CARBON ZERO AMONG
PEOPLE IN THE ARBAEEN PILGRIMAGE**

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Abstract:

The Arbaeen Pilgrimage, one of the largest religious gatherings in the world, attracts millions of people to Iraq annually. As global awareness about climate change and environmental sustainability increases, it becomes essential to examine the environmental footprint of such large-scale events. This paper explores the awareness of the concept of “Net Carbon Zero” among participants in the Arbaeen Pilgrimage, focusing by analysing data from interviews, as well as examining environmental initiatives, this paper aims to provide insights into how sustainable practices can be integrated into the pilgrimage, ensuring that religious devotion and environmental responsibility go hand in hand.

The Arbaeen Pilgrimage, held annually to commemorate the martyrdom of Imam Hussein, is a significant event for millions of Muslims worldwide. It involves a mass gathering of pilgrims who travel to the holy city of Karbala, Iraq, covering vast distances by foot, vehicle, and other means of transportation. While this event holds immense religious and cultural importance, its environmental impact specifically its carbon footprint has raised concerns in recent years.

In response to global environmental challenges, the concept of “Net Carbon Zero” has gained prominence to reduce or offset carbon emissions to point where the net result is zero. The objective of this paper is to assess the level of awareness of Net Carbon Zero among the people participating in the Arbaeen Pilgrimage, understand their attitudes toward environmental sustainability, and identify potential strategies for reducing the pilgrimage’s carbon footprint.

Keywords:Arbaeen Pilgrimage-Net Carbon Zero-Environmental Sustainability-Carbon Footprint-Green Initiatives

OVERVIEW: NET CARBON ZERO AWARENESS

In the context of religious events like Arbaeen, environmental responsibility is not often discussed, yet it represents an area of significant potential for positive change. Pilgrims typically travel vast distances by foot, bus, and other means, resulting in high energy consumption and greenhouse gas emissions. However, efforts are emerging from various sectors to encourage green practices during these events, such as eco-friendly transportation, waste reduction, and recycling initiatives.

The Arbaeen Pilgrimage, which attracts millions of people to Karbala, Iraq, is one of the largest religious gatherings in the world. It commemorates the martyrdom of Imam Hussein, drawing pilgrims from around the globe. With such a vast number of attendees, the event carries a significant environmental impact, especially in terms of carbon emissions, waste generation, and energy consumption. As global awareness of climate change and sustainability grows, the concept of “Net Carbon Zero” achieving a balance between the amount of carbon emitted and the amount removed from the atmosphere has gained attention as an important goal for reducing the environmental footprint of large-scale events like Arbaeen.

Current Awareness Levels

Awareness of Net Carbon Zero among pilgrims in Karbala is generally limited. While many attendees understand the basic environmental impact of large gatherings, detailed knowledge of carbon emissions, reduction strategies, and the concept of achieving a Net Carbon Zero status is still relatively low. This is partly due to a lack of targeted education and outreach about the environmental consequences of the pilgrimage. However, some pilgrims and local community members exhibit a growing interest in sustainable practices.

Barriers to Achieving Net Carbon Zero

Achieving Net Carbon Zero during the Arbaeen Pilgrimage faces several significant obstacles:

1. Lack of Infrastructure:

The infrastructure needed for large-scale waste management, renewable energy sources, and eco-friendly transportation is still underdeveloped in Karbala. As a result, implementing sustainable practices on a large scale is challenging.

2. Cultural and Religious Norms:

The emphasis during the pilgrimage is primarily on religious observances and traditions. Changing behaviours and practices to align with environmental sustainability often requires overcoming cultural barriers and convincing pilgrims that these actions are also an important part of their religious devotion.

3. Financial Constraints:

Funding sustainable initiatives in a region with limited resources is a persistent challenge. Investments in infrastructure and green technologies are costly, and while some initiatives have gained traction, they are still relatively small in scale compared to the magnitude of the event.

While awareness of Net Carbon Zero during the Arbaeen Pilgrimage in Karbala is still in its early stages, there is a growing recognition of the need to address the environmental impact of the event. Efforts to promote sustainability, such as eco-friendly transportation, waste reduction, and sustainable food practices, are gaining momentum. However, significant barriers such as infrastructure limitations, cultural resistance, and financial constraints still hinder the full realization of a Net Carbon Zero pilgrimage. Moving forward, increased education, collaboration, and investment in sustainable technologies are essential to make the pilgrimage more environmentally friendly and help reduce its carbon footprint.

RESEARCH QUESTIONS

This paper is related to understanding the awareness of net carbon zero can vary depending on the context and the goals of the research. Based on the research problem, specific research questions are:

1. What is the current level of awareness regarding the concept of “ Net Carbon Zero”?
2. How do people in who involved in large scale event Arbaeen perceive the importance of achieving net-zero carbon emissions?
3. What is the potential strategies for enhancing public engagement with climate change and carbon neutrality during Arbaeen Pilgrimage?
4. How attendees and organizers are responding to the challenges of reducing carbon emissions?.
5. How sustainable practices can be integrated into the pilgrimage, ensuring that religious devotion and environmental responsibility go hand in hand.

These questions aim to provide a structured approach to understanding net-zero carbon awareness in Karbala, Iraq.

QUALITATIVE RESEARCH METHODOLOGY: FOCUS GROUP DISCUSSION

Focus groups are typically used to gain a deeper understanding of a topic or to explore various aspects of a study, such as attitudes, treatments, strategies, and perspectives of a group (Liamputtong, 2014). This method is deemed appropriate and applicable for this study. Focus group discussions are commonly used as a qualitative tool to gain in-depth insights into social issues. The primary objective is to gather data from a specifically chosen group, rather than a statistically representative sample of the wider population.

For this research, the researcher opted for a focus group approach. The focus groups were conducted in person, as offline discussions were selected informants engaged in interactive dialogue to provide qualitative insights.

The selection of informants was based on several criteria, with six participants in each group. In total, 12 focus groups were held, with informants chosen according to these parameters. As outlined in Table 1.1 below, the people who attending Arbaeen were organized into these groups. The purpose of selecting these groups was to explore their awareness of net carbon zero, with direct participation in offline discussions in Karbala, Iraq.

(Table 1.1) Sampling of Informants

Title	Description	Fraction	Total
People	Youth	72 peoples	72 peoples
Age	Youth	15 to 30 years old	
Gender	Man	34 peoples	
	Woman	38 peoples	
Area	Karbala, Iraq	6 peoples in 1 group	12 groups

Several parameters have been identified especially in the selection of informants. As much as 72 peoples who have an attending Arbaeen and also have experience in the field of net carbon zero were recruited as informants in this study. Based on Table above, informants in this study comprised from youth. The purpose for the selection of these groups is to observe if there is any differentiation and hence to get a better understanding of consciousness towards awareness among peoples.

DATA COLLECTION

The data collection process is essential for gathering information from informants in the studies conducted. In this study, focus groups were conducted with youths in Karbala, Iraq. Through these focus groups, the study aimed to explore the experiences and awareness of people. The sessions typically lasted between 1 to 1 ½ hours. Details of the focus group implementation are provided in Table 1.2 below. A total of 72 informants participated in the focus groups, with each group consisting of 6 informants. Table 1.2 presents information on the focus group participants.

Table (1.2) Focus Group Implementation Informant

Informant Category	Method	Month	Informant Number
Youth	Focus Group 1-12	August 2024	72 peoples

The implementation of this focus group process involves five steps. The first step is group formation. In this study, each focus group consisted of six participants from various races and backgrounds around Karbala, Iraq. A total of 12 closed offline sessions were conducted. The second step is appointing a moderator. In this study, the researcher himself served as the moderator. Ahmad Sunawari Long (2011) suggests that it is prefera-

ble for moderators to be unfamiliar to the informants to avoid shyness or lack of engagement. The moderator’s main role in this study was to lead the discussion, take notes, and ensure the discussion proceeded smoothly. The third step is holding a brief familiarization session. This session takes place before the discussion begins to help informants, who come from diverse backgrounds and do not know each other, become comfortable. The informants are asked to introduce themselves, share where they live, and other personal details and this session lasts about 10 minutes. The fourth step is the discussion session on the study. This is a crucial part of the process as it provides the data needed for the study. The moderator asks a series of questions to the informants, encouraging their responses. However, this is done only after obtaining permission from the informants. The final step involves the researcher thanking the informants for their participation and for dedicating their time to the research.

DATA ANALYSIS

Data analysis follows once the informants have provided their responses. The information collected and was transcribed into text for the focus group and interview procedures. After completing the informant interviews, data analysis was conducted, allowing for comparisons between different groups and making observations about them. To ensure accurate results, the data were further analysed using NVIVO 12 software. Additionally, each informant in the focus group was assigned a label to facilitate the organization and identification of themes in the study, while also maintaining the confidentiality of the participants. This labelling process simplified the presentation of the study’s findings. The labelling of focus group informants is shown in Table 1.3 below:

Table (1.3) Focus Group Informant Labelling (KF)

Focus Group	Informant Number	Informant Labelling
1-12	72	FG1-FG72

To facilitate the data analysis process, each of the objectives of this study has been divided into specific categories. In summary, good research methodologies make it easier for researchers to obtain findings quality while reducing information inaccuracies.

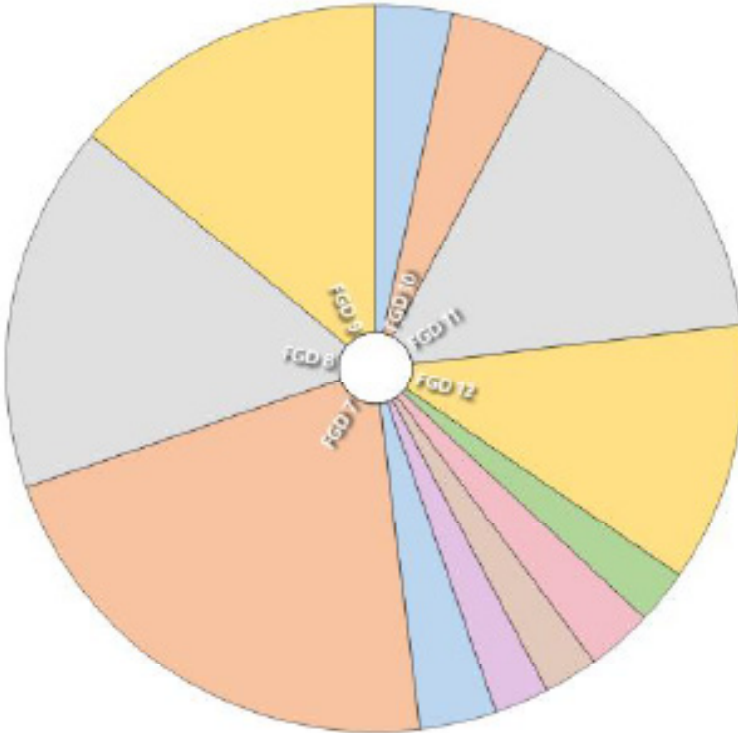


Figure 1.1: Hierarchy Chart Focus Group Discussion

Figure 1.1 shows Hierarchy Chart by Focus Group Discussion. 12 group involves in this research. FGD 11 is the highest codes and FGD 7 is the highest reference which involves and give much information related with this research. Meanwhile FGD 2,4 and 5 is the lowest which contribute the information in this research.

Table (1.4) Compared by number of coding references

Files	Number of coding references	Number of nodes coding
Files\\INTERVIEWS\\FGD 1	7	4
Files\\INTERVIEWS\\FGD 2	5	3
Files\\INTERVIEWS\\FGD 3	6	3
Files\\INTERVIEWS\\FGD 4	5	3
Files\\INTERVIEWS\\FGD 5	5	3
Files\\INTERVIEWS\\FGD 6	7	4
Files\\INTERVIEWS\\FGD 7	45	21
Files\\INTERVIEWS\\FGD 8	34	12
Files\\INTERVIEWS\\FGD 9	29	10
Files\\INTERVIEWS\\FGD 10	9	4
Files\\INTERVIEWS\\FGD 11	32	22
Files\\INTERVIEWS\\FGD 12	24	17

RESULTS AND DISCUSSION

The exploration of awareness regarding net carbon zero among informants in the Arbaeen Pilgrimage revealed diverse perspectives on environmental sustainability and the role of individuals in reducing carbon emissions. The findings indicate varying levels of understanding and engagement with the concept of net carbon zero, depending on factors such as education, cultural background, and exposure to environmental initiatives.

Through focus group discussions, several key themes emerged:

1. Awareness of Carbon Emissions:

Many informants were familiar with the term “carbon emissions,” but the concept of “net carbon zero” was less widely understood. While some informants recognized the importance of reducing emissions to combat climate change, they struggled to grasp the full implications of achieving net carbon zero, particularly in the context of large-scale events like the Arbaeen pilgrimage.



Figure 1.2: Hierarchy Chart by Coding Reference

Figure 1.2 shows that Understanding Local Awareness is a Theme and has three (3) categories including importance perception, general knowledge and awareness channels. Understanding Local Awareness has 3 direct coding references and 6 aggregated coding references, and 3 direct items coded, and 3 aggregated items coded.

2. Sustainable Practices During Pilgrimage:

Informants shared varying experiences and practices during the pilgrimage related to sustainability. Some reported efforts to minimize waste, such as using reusable water bottles and reducing plastic usage, while others highlighted challenges due to the scale of the event and lack of infrastructure to support sustainable practices.

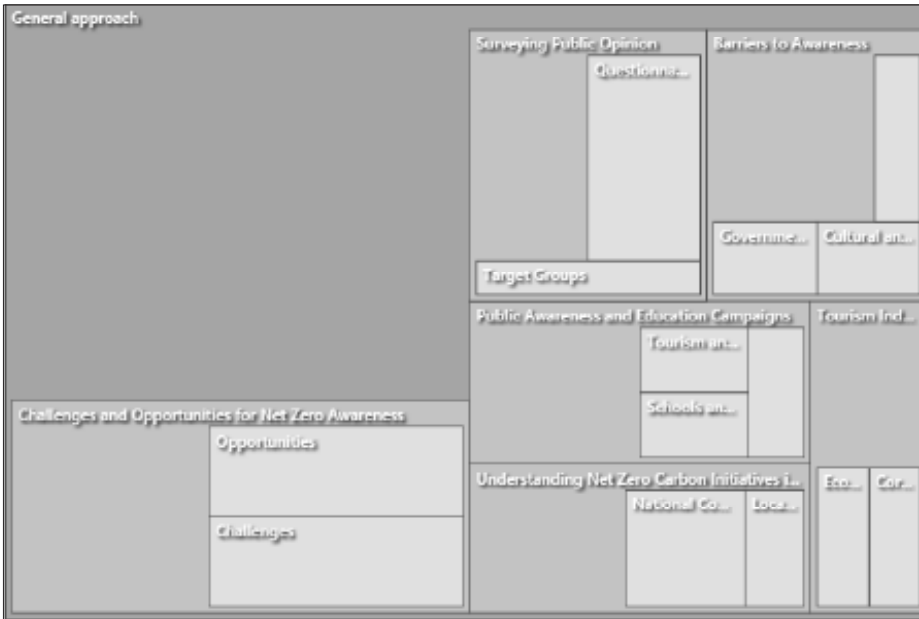


Figure 1.3: Hierarchy Chart by Coding Reference

Figure 1.3 shows that General Approach is a Theme and have six (6) categories includes Understanding Net Zero Carbon Initiatives, Public Awareness and Education Campaigns, Barriers to Awareness, Surveying Public Opinion, Tourism Industry's Role and Challenges and Opportunities for Net Carbon Zero Awareness. General Approach has 37 direct coding references and 116 aggregated coding references and 20 direct items coded and 20 aggregated items coded.

Local government:

<Files\FGD 7> - § 1 reference coded [3.39% Coverage].

Reference 1 - 3.39% Coverage.

Local government authorities align with these national goals includes local environmental projects, regulations, and tourism management policies can be key drivers of awareness.

Corporate Social Responsibility:

<Files\FGD 7> - § 1 reference coded [2.82% Coverage]

Reference 1 - 2.82% Coverage

Larger businesses in Karbala, especially those in the tourism and hospitality sector, may have CSR programs focused on reducing carbon emissions.

Community Workshops:

<Files\FGD 7> - § 1 reference coded [3.00% Coverage]

Reference 1 - 3.00% Coverage

Local NGOs and international organizations often conduct workshops on climate change, renewable energy, and sustainable practices in regions in Karbala.

3. Perception of Responsibility:

A common theme in the discussions was the shared responsibility between individuals, organizations, and governments in achieving net carbon zero. While many informants acknowledged that individual actions matter, there was a consensus that greater responsibility lies with organizations and policymakers to provide the necessary resources, infrastructure, and guidance to enable large-scale sustainable practices.



Figure 1.4: Hierarchy Chart by Coding Reference

Figure 1.4 shows that Suggestions and Recommendations for Enhancing Net Zero Carbon Awareness among People is a Theme and have ten (10) categories includes Collaboration with International and Local NGOs, Community-Based Environmental Education Programs, Cultural Sensitivity in Communication, Encourage Citizen Participation in Decision-Making, Government and Policy Interventions, Integration of Net Zero Concepts into Tourism Packages, Leveraging Sustainable Tourism as a Model, Mon-

itoring and Evaluation of Progress, Public-Private Partnerships (PPP) for Sustainable Infrastructure and Utilize Digital Platforms for Outreach. Suggestions and Recommendations for Enhancing Net Zero Carbon Awareness among People have 3 direct coding references and 33 aggregated coding references and 1 direct item coded and 10 aggregated items coded.

4. Educational and Awareness:

Despite some level of awareness, there was a notable lack of in-depth knowledge about the practical steps necessary to achieve net carbon zero, both at the individual and collective level. Several informants expressed interest in learning more about how they could contribute to carbon reduction efforts, particularly in relation to religious and cultural events like the Arbaeen pilgrimage.



Figure 1.5: Hierarchy Chart by Coding Reference

Figure 1.5 shows that Public Awareness and Educational Campaign is a Theme and has three (3) categories includes Tourism and Environmental Sustainability, School and Universities and Community Workshops. Public Awareness and Educational Campaign have 3 direct coding references and 6 aggregated coding references and 1 direct item coded and 1 aggregated items coded.

5. Challenges and Opportunities:

One of the significant challenges identified was the logistical difficulty of implementing sustainable practices during such a large-scale religious gathering. However, informants also identified opportunities for collaboration between religious organizations, local governments, and environmental groups to promote sustainability and integrate net carbon zero initiatives into future pilgrimages.



Figure 1.6: Hierarchy Chart by Coding Reference

Figure 1.6 shows that Challenges and Barriers is a Theme and have two (2) categories includes Educational Gaps and Economic Constraints. Challenges and Barriers have 5 direct coding references and 9 aggregated coding references, and 3 direct items coded and 3 aggregated items coded.

Opportunities and Recommendations

1.Incentives for Green Practices:

<Files\\FGD 6> - § 1 reference coded [7.84% Coverage]

Reference 1 - 7.84% Coverage

Advocate for incentives for locals and businesses adopting sustainable practices, such as tax reductions, subsidies, or recognition programs.

2.Education and Outreach Programs:

<Files\\FGD 6> - § 1 reference coded [8.61% Coverage]

Reference 1 - 8.61% Coverage

They suggest implementing more public awareness programs, possibly in collaboration with tourism operators, to integrate net-zero concepts into daily life.

3.Eco-Friendly Tourism Models:

Encourage the promotion of eco-friendly tourism, like carbon-neutral accommodations or guided tours that focus on environmental conservation.

OVERALL DISCUSSIONS

The results suggest that while there is a basic awareness of environmental issues among the informants in the Arbaeen pilgrimage, there is a need for more targeted education on the concept of net carbon zero. Providing information on how individuals and organizations can contribute to reducing carbon footprints, particularly in large-scale events, would help foster greater engagement with sustainability efforts.

Moreover, the findings highlight the importance of collaborative efforts between various stakeholders to create infrastructure and policies that support sustainability during such events. Future initiatives could focus on raising awareness, implementing sustainable practices at pilgrimages, and working towards integrating carbon offsetting measures in religious and cultural events.

Efforts to Promote Sustainability

Despite the challenges, initiatives to reduce the pilgrimage's environmental impact that can be gradually implemented. These includes:

1. Eco-Friendly Transportation:

With millions of people traveling to Karbala, transportation is a major source of emissions. Efforts can be made to introduce more eco-friendly transportation options such as electric buses and organized carpooling systems to reduce the number of vehicles on the roads.

2. Waste Management Programs:

Given the massive waste generated by pilgrims, particularly in the form of plastic, there have been steps toward better waste management, including recycling campaigns and the distribution of reusable items like water bottles.

3. Sustainable Food Practices:

Large-scale kitchens serving food to pilgrims often use disposable plastic plates and cutlery. There have been efforts to reduce this by encouraging the use of biodegradable or reusable alternatives.

4. Green Awareness Campaigns:

Some local organizations and environmental groups have begun to engage with pilgrims directly, distributing literature and offering workshops on sustainable practices such as minimizing waste, conserving water, and reducing energy consumption during the pilgrimage.

Ultimately, fostering a deeper understanding of net carbon zero among participants in the Arbaeen pilgrimage could play a crucial role in promoting environmental sustainability on a larger scale.

CONCLUSIONS

In conclusions, this paper provides a comprehensive overview of the awareness and practices regarding Net Carbon Zero among Arbaeen pilgrims, offering insights into how large-scale religious events can contribute to environmental sustainability. This paper also aimed to explore the awareness of net carbon zero among people involved in the Arbaeen pilgrimage and to identify strategies for integrating sustainability into large-scale events. Based on the research questions, the following conclusions can be drawn:

1. Current Level of Awareness Regarding “Net Carbon Zero”:

The study revealed that while many participants were familiar with the concept of carbon emissions, the full understanding of “net carbon zero” was limited. There is a need for further education to bridge this gap and provide a clearer understanding of the concept, particularly in relation to large-scale events like the Arbaeen pilgrimage.

2.Perception of the Importance of Achieving Net-Zero Carbon Emissions:

Attendees expressed varying levels of awareness about the importance of achieving net-zero carbon emissions. While some participants recognized the significance of carbon neutrality in addressing climate change, others were less aware of its direct relevance to events such as the Arbaeen pilgrimage.

3.Potential Strategies for Enhancing Public Engagement with Climate Change and Carbon Neutrality:

This study identified several potential strategies to enhance public engagement, including increasing awareness through educational campaigns, providing information on sustainable practices, and promoting collaboration between religious organizations, local governments, and environmental groups. These strategies could encourage individuals to adopt sustainable practices during the pilgrimage and beyond.

4.Response of Attendees and Organizers to Reducing Carbon Emissions:

Both attendees and organizers acknowledged the challenges of reducing carbon emissions during large-scale events like the Arbaeen pilgrimage. While some individuals made efforts to adopt sustainable practices, there was recognition that more needs to be done at the organizational and governmental level to implement effective solutions, such as waste reduction programs and alternative energy sources.

5. Integration of Sustainable Practices into the Pilgrimage:

The study highlighted the potential for integrating sustainable practices into the pilgrimage. By aligning religious devotion with environmental responsibility, it is possible to create an event that is both spiritually meaningful and environmentally conscious. Strategies such as waste management,

energy efficiency, and promoting the use of eco-friendly materials could be incorporated into future pilgrimages to reduce their environmental impact.

While awareness of the environmental impact of the Arbaeen Pilgrimage is increasing, the level of understanding regarding Net Carbon Zero remains limited among most pilgrims. However, the growing momentum for sustainability, both from the pilgrims and the event organizers, demonstrates that there is potential to reduce the pilgrimage's carbon footprint. By improving infrastructure, raising awareness, and integrating more sustainable practices, the Arbaeen Pilgrimage can become an example of how large-scale religious events can contribute to global efforts to combat climate change. Moving forward, the focus should be on continued education, collaboration with environmental organizations, and investment in green technologies to ensure a sustainable future for the pilgrimage.

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