# "Pray For Green, Play For Green": Integrating Religion into Climate Change Serious Games

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**Figure 1: Various deities, and characters associated with climate identified from the Ethnographic study and their representation and role in the game Shloka.**

## Abstract

Effective climate change games must recognize the unique relations various communities have with nature. Further, these serious games must factor how climate change diversely impacts different communities. This paper explores the use of religious narratives and rituals in serious games to communicate the impact of climate change within faith-based communities. The study examines whether integrating religion into serious games can help individuals within these faith-based communities reflect on their connection to the environment and increase their interest in climate change. We present Shloka, a serious game that incorporates Hindu rituals and narratives, to demonstrate how integrating religious elements


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can amplify situational interest, deepen engagement, and provoke thoughtful reflection on climate change within these communities.

## CCS Concepts

• **Human-centered computing → Interaction paradigms**.

## Keywords

Game Mechanics, Serious Games, Religion, Input Modalities, Climate Change

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## 1 Introduction

**Verse 1**

> *The waters rose and covered the mountains to a depth of more than fifteen cubits [...] Every living thing on the face of the earth was wiped out; people and animals and the creatures that move along the ground and the birds were wiped from the earth.*
> - Genesis 7:19-23 [1]

**Verse 2**

> *The fish warned Manu of a coming flood and told him to build a ship. When the flood rose, the fish came, and Manu tied the craft to its horn. [...] Manu, alone of all creatures, survived.*
> - Matsya Puranam (An ancient Hindu text) [2]

Narratives of great floods and natural disasters are found across most religious texts as illustrated in Verse 1 and Verse 2. Such verses underscore humanity's longstanding recognition of nature's formidable power and the balance between human existence and the environment. These stories from the Bible and Hindu scriptures not only highlight catastrophic events but also serve as tales for moral responsibility, stewardship, and the consequences of human actions on the natural world. In the contemporary era, the parallels between these timeless narratives and the escalating reality of climate change are striking.

Religion has historically been a catalyst for social change, mobilizing communities through shared beliefs, values, and collective action [3]. Religious teachings across cultures have long emphasized the sacredness of nature and humanity's responsibility to protect the environment. Many faith traditions advocate for environmental stewardship as a moral imperative. For example, Christianity promotes the concept of "creation care," highlighting the duty to preserve God's creation [4]. In Islam, the Qur'an refers to humans as stewards (*khalifah*) of the Earth, entrusted to maintain its balance and resources [5]. Hinduism venerates the natural world, considering rivers, mountains, and forests as divine manifestations, and encourages living in harmony with all beings [6]. These religious perspectives not only foster a deep spiritual connection with nature but also provide ethical frameworks that inspire proactive engagement in environmental conservation.

Digital games, particularly serious games, have become powerful tools for communicating complex social and environmental issues, including climate change [7, 8]. By simulating the consequences of players' choices, serious games provide an avenue to reflect on an individuals relation with climate, making them an effective medium for climate education. There is strong evidence in serious game literature showing that elements like metaphors [9], narrative familiarity [10], and immersive storytelling [11] are effective in communicating messages. Religious traditions offer rich sources of immersive narratives, metaphors, and culturally familiar frameworks that could enhance player engagement and learning. However, the potential to leverage religion in serious games—particularly in relation to climate change education—has yet to be fully realized. This disconnect limits the potential of games to foster a deeper, more holistic understanding of climate responsibility through the lens of religion.

Previous researchers from a theological lens have examined how religious scriptures interpret climate and how rituals and festivals hinge on environmental conditions [12–15], yet these insights have seldom been deployed in interactive media that encourages users to reflect on their relation with climate. Meanwhile, existing religious artifacts in interaction design—such as worship or meditation aids—focus only on personal devotion rather than environmental concerns [16–18].

Additionally, many serious games that do address climate change struggle to maintain engagement because they rarely tap into players' cultural or spiritual backgrounds [19–21]. As a result, the connections between players' lived traditions, their sense of moral responsibility, and the global challenge of climate change remain underexplored. As the focus of serious games shifts towards more localized approaches to climate change solutions, there is growing recognition that effective engagement with environmental issues requires an understanding of local contexts and cultural perspectives. Religion, with its deep roots in local traditions, offers a powerful framework for bridging this gap in serious games.

In this paper, we introduce *Shloka*, a serious game that integrates Hindu rituals and narratives related to environmental stewardship into its core gameplay. By embedding religious themes directly into gameplay, we aim to harness both faith and the interactive affordances of serious games, thereby fostering deeper reflection on how individuals of the Hindu faith relate to climate change. Although our work focuses only on the Hindu community, it responds to the growing recognition that 'one-size-fits-all' climate interventions often struggle to address the distinct cultural, social, or geographical factors that shape people's climate perceptions [22–24]. As part of our game development process, we co-designed with stakeholders, and visited religious spaces to bring nuance elements of the Hindu community into the designed serious game.

Scholars working towards climate change from both a religious lens and serious game lens agree reflection on individuals relation with climate is an important precursor to meaningful, sustained behavior change [25–29]. In the game Shloka, we hypothesize that when players pause to reflect on how faith-based teachings relate to environmental decisions, it can inspire deeper motivation and help communicate the issue of climate change. For serious games to effectively promote pro-environmental reflection, communication and decision making, they must not only inform players but also sustain their interest and emotional involvement.

To examine these issues, we conducted a research-through-design (RtD) process in creating *Shloka* and carried out a mixed-methods study comparing it to climate-focused serious games lacking religious elements. Based on the above, our study focues on two questions:

- **RQ1:** How does the integration of religious rituals and narratives in a serious game enhance players' *reflection* and *interest* in climate change?
  - *Rationale:* Reflection and interest serve as vital precursors to intentional climate choices [25–29]. By examining how faith-based storytelling and ritual elements encourage thoughtful engagement, we can discern whether these design strategies lead to more profound insight and emotional investment in environmental issues.
- **RQ2:** How does the integration of religious rituals and narratives in a serious game influence *engagement* and *player experience*?
  - *Rationale:* Engagement and a positive user experience are critical to any serious game's efficacy. If religious frameworks within the game resonate with players' cultural or spiritual identities, they might feel more immersed and motivated to continue exploring pro-environmental themes.

On that pre-text, we make the following contributions:

- **Designing Interactive Systems based on Religious Narratives, and Rituals:** We present the design and development of *Shloka*, a novel serious game that integrates Hindu religious narratives to address climate change. To the best of our knowledge, this is one of the first serious games that aims to teach scientific concepts using religious metaphors.
- **A Replicable Research-through-Design Methodology:** We detail our process of collaborating with cultural stakeholders, conducting ethnographic fieldwork, and engaging in iterative design and playtesting to create *Shloka*. This approach can serve as a framework for future endeavors that seek to develop religion-based or culturally relevant climate games in other contexts.
- **Enhanced Player Engagement and Reflection through Religious Elements:** We provide evidence on the effectiveness of religion in enhancing player engagement and promoting reflection in the context of climate change. We highlight how rituals and narratives associated with religion might foster greater engagement with climate change compared to other popularly used serious game mechanics for climate change.

In the following sections, we review related literature on religion and environmental stewardship, serious games for climate change (Section 2). We then detail the methodology to develop and evaluate Shloka (Section 4), and present our findings (Section 8). Finally, we discuss the implications of our work and outline directions for future research (Section 9). Given this work deals with the intricacies of religion, we strongly encourage readers to review the positionality of the authors to understand how our background might have influenced this work.

## 2 Previous Work

### 2.1 Religion For Climate Change

Although each religion offers insights into humanity's relationship with nature, this paper focuses on how Hinduism intersects with climate change. For an overview of how other religions (e.g., Islam, Christianity, Buddhism) engage with climate and nature, see Appendix A.

Hinduism intrinsically links the divine to every aspect of nature, framing environmental stewardship as a sacred duty rather than a mere ethical concern. As Williams [30] notes, "A Hindu is prepared to worship every object in heaven and earth—the sun, moon, stars, rocks, trees, shrubs, pools, seas, rivers, animals, and even noxious reptiles." This perspective embeds a deep respect for the natural world within religious practice.

Scholars have examined how Hindu texts and traditions emphasize the sacredness of nature. Prime [31] introduces the concept of Vedic ecology, explaining that Hindu narratives personify rivers, mountains, and trees, encouraging their worship and preservation. This ethos is evident in the popular reverence for Neem, Banyan, and Tulsi. Haberman [32] highlights the spiritual significance of personifying rivers and mountains. Principles like *Vasudhaiva Kutumbakam* ("The whole world is a family") further foster a holistic view of the environment, advocating a lifestyle that benefits all creation [33]. This worldview closely aligns with sustainable practices and offers valuable insights for addressing climate change.

Despite these profound teachings, there exists a paradox between Hindu environmental ideals and contemporary practices. Lal [12] and Alley [34] highlight how revered natural sites like the Ganges River suffer from severe pollution, conflicting with the religious imperative to protect and honor these sacred entities. Rituals such as idol immersion [35, 36] and the use of firecrackers during Diwali have environmental repercussions [37–39], raising questions about the practical application of ecological principles in modern Hindu society. This disconnect impacts not only the environment but also the cultural and religious practices dependent on it. Rana [40] describes how climate change threatens traditional Hindu rituals. For instance, Whitmore [41] details how climate change impacts the annual Amarnath pilgrimage in the Himalays, reducing both the idol size and making access to the shrine more difficult. Similarly, Banerjee [42] identifies how holy pilgrim sites along the coast of the Indian ocean are susceptible to rising ocean levels. Similarly, Sharma [43] identifies how the holy ritual of taking a dip in the Holy Ganges is harmful due to the increasing pollution. Pandey [44] identifies how religious festivals like Sankranthi are tied with rainfall, are being disrupted due to unpredictable rainfall cycles. With the religious community and religious population being prone to impact from climate change, it is essential for these communities to be aware of climate change consequences and actions to positively contribute to climate change.

Hindu communities and organizations are working to align religious practices with environmental conservation. Initiatives like the Isha Foundation's Cauvery Calling [45] and Ganga River restoration projects highlight efforts rooted in Hindu values. Government policies, such as firecracker regulations during Diwali [46], also reflect growing environmental awareness. However, these initiatives often lack broad engagement and underutilize interactive technologies to educate and inspire the Hindu community effectively.

Despite the rich ecological ethos of Hinduism and some localized initiatives, there remains a significant gap in active interventions that educate and encourage climate action from a Hindu perspective.

Existing studies have primarily focused on analyzing the relationship between Hinduism and the environment [12, 47], but few (to none) have translated these insights into practical tools or interactive technologies that engage individuals on a personal level. There is a need for innovative approaches that harness the cultural familiarity and spiritual significance of Hindu narratives to foster environmental awareness and action. This work explores how integrating Hindu narratives and rituals into serious games can enhance engagement and reflection on climate change for Hindu stakeholders.

## 2.2 Serious Games For Climate Change

Flanagan [48] defines serious games as those designed with intentional educational goals, using entertainment and game mechanics to facilitate learning. Various researchers, have demonstrated how serious games are effective in communicating the complex problem of climate change [49–51].

Climate change encompasses various human actions that impact different aspects of the environment. This raises the question of which specific aspect of climate change a game should focus on and what mechanics are effective in creating climate interventions. Madani et al. [52], in their analysis of 25 serious games on climate change, identified recurring themes such as water management, irrigation, ecosystem ecology, and waste management. Similarly, Barnes [53], through participatory design and grounded theory, found that student-designed climate change games often addressed (1) carbon emissions, (2) transportation, and (3) deforestation. On a similar context, our paper focuses on climate change challenges that religious populations currently face or will encounter in the near future if proactive climate actions are not undertaken.

Card and Board games are popular style of games that are used in the development of climate change serious games. Eisenack [54] introduces a board game called "Keep Cool" to teach sustainable energy practices to students. In a review of board games for climate change, Fjaellingsdal [20] mentions that board games offer simplified scientific communication about the environment, allowing individuals to mentally map the impacts of climate change to their actions. Callahan [55] takes inspiration from Pokemon cards, and creates a card game illustrating the importance of biodiversity for climate change. Callahan [55] argues that card games allow users to process and learn information resulting in increased knowledge among the players regarding biodiversity and its correlation to climate change.

Abraham [56] discusses the increasing use of digital mini-games to educate players about climate change, while Wu [57] highlights the growing trend of online climate change games that integrate interactions between the digital and physical worlds. These interactions often take the form of simulations, using diverse input modalities to raise awareness and educate players about climate change consequences [58]. Although popular mechanics like board and card games, digital mini-games, and AR/VR/ARG simulations address climate change, there remains a gap in understanding how familiar mechanics might better inspire reflection and action. This paper explores how rituals, rooted in the sense of familiarity and relatedness offered by religion, can enhance reflection and prompt action, particularly for hyper-local climate challenges where religious communities have strong regional and environmental ties.

Reckien [22] also distinguishes between local and global climate change games, wherein the impact of climate change and mitigation strategies is communicated to players using either local or global references. For instance, Bontchev [24] develops a game titled "Let us Save Venice" which focuses on developing resilience and teaching climate strategies for the citizens of Venice. Similarly, Salvini [23] develops and tests a role-playing game to comprehend the impact of smart agriculture on the local climate in a village in Brazil. On the other hand, Sterman [59] develops and tests a role-playing game specifically designed for climate negotiations between countries at the United Nations.

Research suggests that adapting climate action narratives to hyper-local contexts enhances effectiveness, as people are more likely to engage with issues affecting their immediate environment [60]. However, climate change games rarely incorporate hyper-local contexts or the cultural and spiritual dimensions of religion. This omission limits their potential to deeply connect with players and inspire meaningful reflection and behavior change. Our work addresses this gap by integrating Hindu narratives and rituals into serious games to foster engagement, encourage environmental stewardship, and motivate climate action for Hindu stakeholders.

# 3 Positionality

In the study of religion, culture, and associated artifacts, the worldview of researchers inevitably influences data collection and analysis. To provide transparency, we share the backgrounds and belief systems of the authors, which may have shaped the outcomes of this work.

The first, second, and third authors are practicing Hindus. They have access to all the temples and places of worship mentioned in this work, and each has visited at least one of these temples. Their roles included recruiting stakeholders, visiting temples, and analyzing the data.

The fourth and fifth authors are not practicing Hindus. The fourth author identifies as agnostic, with a focus on understanding and respecting diverse belief systems without subscribing to any particular religious framework. The fifth author has prior publications in the field of religion (specifically involving Hinduism) and videogames and is majorly familiar with Islam. The fourth and fifth authors played a critical role in mitigating potential biases by overseeing meetings, contributing to analysis, and guiding the framing of this work. Finally, the first, second, fourth, and fifth authors are trained game designers, developers, and researchers.

# 4 Methodology

We take a research through design approach in developing and evaluating our game Shloka. As illustrated in Figures 2, 6, and 8. Our methodology adopts the following steps:

- **Game Ideation Step:** This step involved generating insights through an ethnographic study at Holy Hindu temples (Figure 2). We aimed to understand various rituals, metaphors, narratives, and the efforts by the Hindu community towards climate action (Section 5). The outcomes include a design space of metaphors

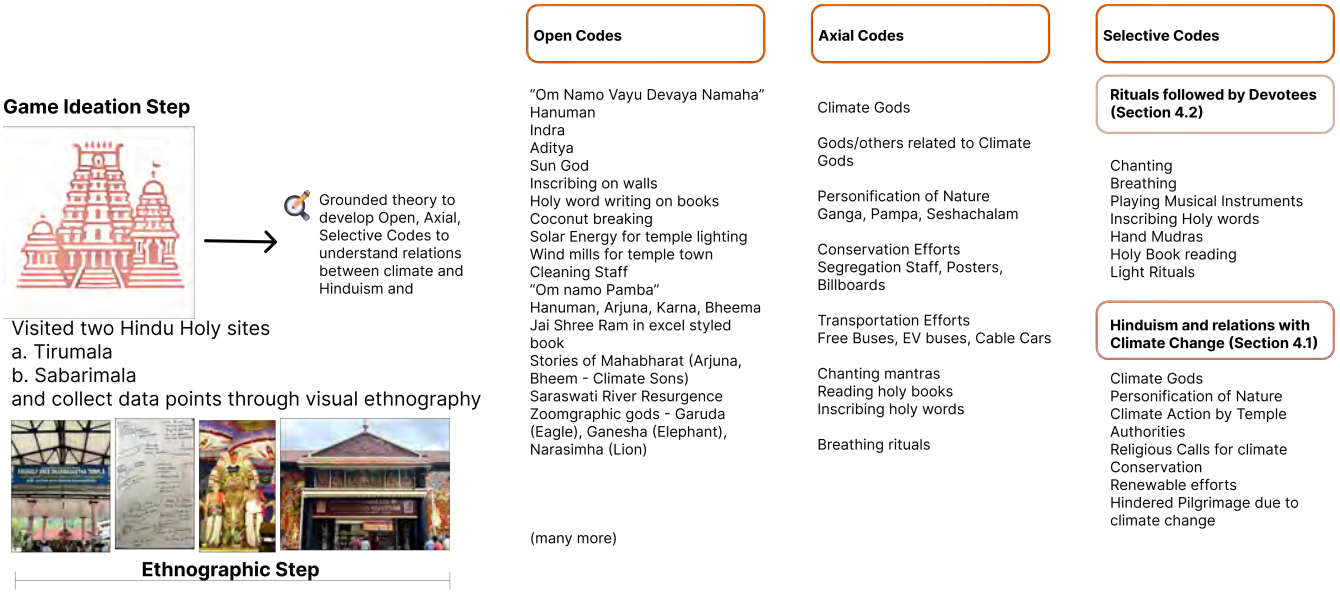



**Figure 2: As part of the ideation step, we conducted an ethnographic study at two temples, from collected data points, we identify game mechanics and narrative to support the design of our game.**

connecting Hinduism to climate change and a set of rituals that can be used as part of gameplay.

- **Game Design Step:** In this step, we iteratively developed game prototypes and gathered feedback on cultural sensitivity (Figure 6). The outcome includes the game Shloka.
- **Game Evaluation Step:** Our final step involved an evaluative phase, where we conducted playtests comparing our game with other existing climate change games (Figure 8). In the subsequent sections, we explain each of the above steps, and finally discuss the results of our evaluative step.

## 5 Game Ideation Step: Ethnographic Studies of Cultural Spaces

To explore the intersection of Hinduism and climate elements within religious spaces, we drew on methodologies employed by researchers conducting ethnographic studies in cultural settings. Specifically, we referenced Maram's work [61], which combined visual ethnography with a constructivist grounded theory approach to analyze data and develop new videogame characters in the context of religion. Building on this approach, we conducted a visual ethnographic study at two prominent Hindu temples in India: Tirumala and Sabarimala, to investigate the connections between Hindu rituals and climate-related themes.

The first author, a practicing Hindu, actively participated in local practices, rituals, and customs. We collected 412 photographs and 43 videos. In places where photography was restricted, we documented the sites through sketches and notes (Figure 2). Our data capture focused on rituals performed by devotees, deities worshiped, climate change initiatives led by temple communities, and factors contributing to local pollution.

### 5.1 Analysis of Ethnographic Data

Although only one researcher visited the temples for this study, the second author, a practicing Hindu, has personal experience visiting at least one of these temples as part of their upbringing. This familiarity with the rituals, narratives, and practices associated with both temples provided valuable positionality in analyzing the data. From constructivist grounded theory lens (i.e. researcher co-creates meaning within the domain they are studying [62–64] - here climate change and serious games) we aimed to to identify insights that relate to Hinduism and Climate change, and identify rituals that can be used as interaction mechanics in videogames. As illustrated in Figure 2, we developed open codes, axial codes, and selective codes that explore the relationship between Hinduism and climate change, and identify Hindu rituals that could be translated into game mechanics. Section 5.2 and Section 5.3 discuss findings from the ethnographic study and grounded theory exercise.

### 5.2 Identified Relations between Hinduism and Climate Change

We identified six major instances on how Hindu stakeholders and institutions interact with climate change. We aim to use these interactions as part of our narrative design for the proposed game.

*5.2.1* ***Personification of Nature:*** Across the hike, numerous elements associated with nature were personified and worshiped. For instance, in Figure 5 (h), we highlight how trees were worshiped in Tirupati. Similarly, as shown in Figure 5 (i) near Sabarimala we noticed how rivers were worshiped in the form of deities. Further, as illustrated in Figure 5 (i), we noticed devotees taking dips, throwing coins, and lighting candles, immersing idols. However, we saw signs and posters by the temple authorities encouraging people to not leave behind coins and idols as they disturb the flow off the river.

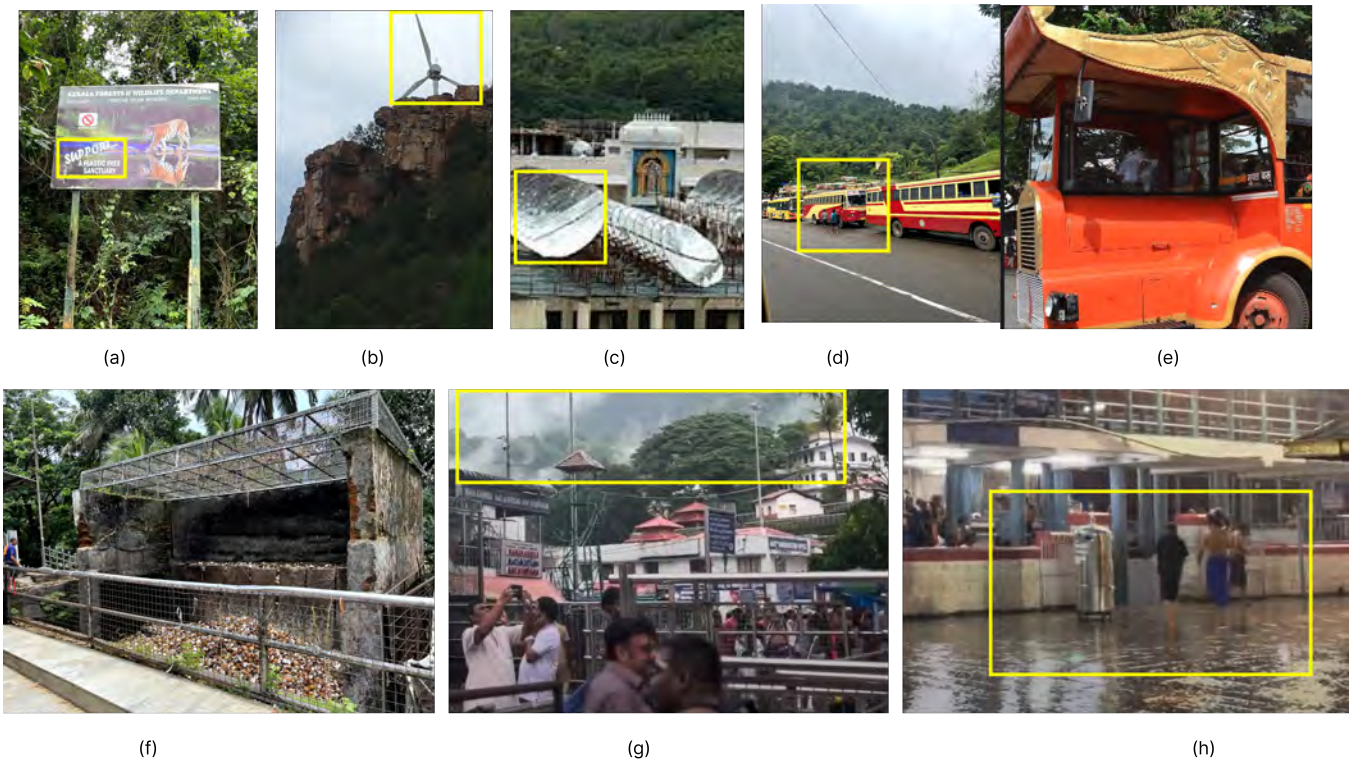



**Figure 3: (a) Authorities calling for a plastic free hill, (b) Windmills around the hiking areas to the temple, (c) Solar panels being used for holy food preparation, (d,e) Buses and free EV buses to support transportation of devotees to minimize car usage, (f) Dedicate organic segregation and collection centerm (g,h) Fog, low visibility and rain caused devotees to rush back from the queues to cover.**

Figure 4 (f) also illustrates how priests near a temple near the ocean, worship the ocean (the ocean god is termed as Varuna in Hinduism).

*5.2.2* ***Gods for Climate Elements:*** In the temple towns of Tirupati and Sabarimala, we noticed multiple mini-temples for gods associated with climate, as illustrated in Figure 1. For instance, we noticed the Sun god being worshiped repeatedly under the name "Aditya" and "Surya". Similarly, the deity of wind (Vayu), the deity of rain (Indra) were also seen to be worshiped. Further, the forests in which these temples resided were also considered holy and had dedicated forest gods (Figure 4 (b), where devotees hiked the forest path without footwear and, in cases of extreme devotion, on knees, as illustrated in Figure 5 (d). Further, as illustrated in Figure 4 (d) we found gods who were children of climate gods. For instance, we noticed several temples of Hanuman, who is considered the son of the wind god.

*5.2.3* ***Hindered Pilgrimage due to Climate Hazards:*** Both Tirupati and Sabarimala are located on hilltops, requiring devotees to hike through dense forests. However, the weather conditions in these areas often determine how devotees can reach the temple. For instance, the researcher encountered heavy rain before starting the hike to the temple, resulting in the closure of hiking paths and preventing devotees from reaching the temple. Areas where road was available, the rains and fog made the drive dangerous, given the numerous hairpin curves in the hilly terrains, thus preventing devotees from accessing the hill top as illustrated in Figure 3 (g). Furthermore, the temple space, as shown in Figure 3 (h), was open without a roof, meaning devotees had difficulty standing in line during the rain. Similarly, during periods of heavy rainfall, the river's flow increased, making it challenging for devotees to take holy dips.

While the researcher did not face any climate-related challenges while hiking Tirumala, they observed warning signs put up by the temple authorities regarding potential landslides [1]. Additionally, due to the extensive development in the temple areas, deforestation was prevalent, and signs warned visitors to be cautious of wildlife, especially leopards.

*5.2.4* ***Renewable Efforts:*** Additionally, as illustrated in Figure 3 (d) and (e), the authorities encouraged the use of public transport by providing free electric buses (EV buses) for devotees to travel around the hill and visit other temples. We also noticed that temple authorities promoted the use of renewable energy sources. For example, Figure 3 (c) illustrates how the holy food preparation facilities were powered by solar panels, and similarly Figure 3 (b)

[1]https://www.deccanchronicle.com/news/landslides-hit-tirumala-ghat-road-amid-heavy-rain-1830576

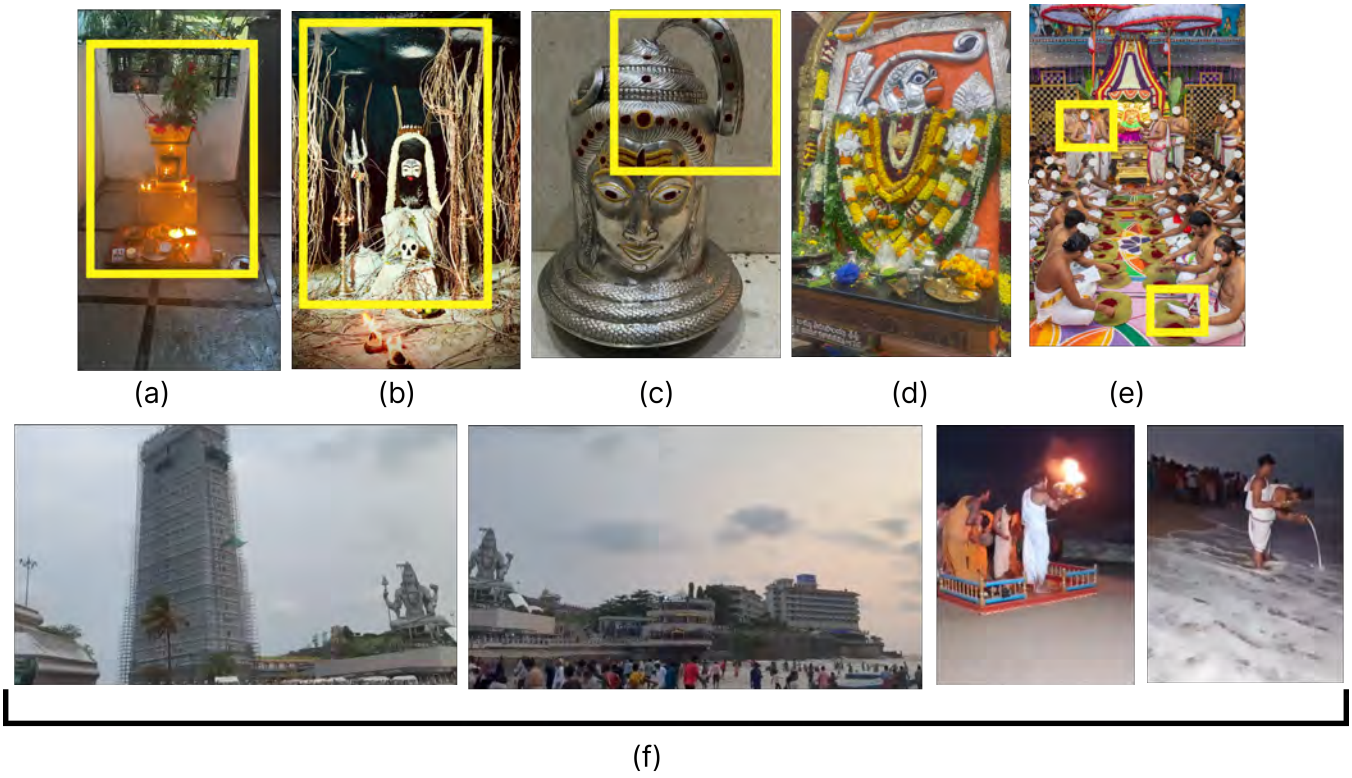



**Figure 4: (a) The worship of a sacred plant, (b) The worship of a forest in the form of a diety, (c) The River Ganges originating from the Head of Lord Shiva, (d) Hanuman the son of Wind God, (e) Chanting ritual and Holy Book reading ritual, (f) Temple beside the ocean, and priests praying to the ocean.**

illustrates how throughout the hiking areas, we saw windmills generating power to support the temple town.

*5.2.5* ***Structured Waste Disposal:*** The influx of millions of devotees resulted in the generation of various types of waste, including water pollutants, solid waste, and prayer materials. We also observed post-prayer offerings, such as flowers, oil, and charcoal, being dumped in open areas. However, temple authorities have dedicated staff to manage waste disposal, and we also noticed segregation facilities encouraging devotees to recycle their waste, as illustrated in Figure 3 (f).

*5.2.6* ***Religious Calls for Climate Action:*** An interesting aspect we observed was how temples and their authorities support climate action efforts. Both Sabarimala and Tirumala requested devotees to refrain from using plastic in the forest areas, as illustrated in Figure 3 (a). The posters often stated that the forest is the abode of the deity, emphasizing that it is the devotees' duty to protect it. This message conveyed that it is not only an environmental responsibility but also a religious duty to treat the forests and rivers with care and respect.

## 5.3 Identifying and Digitizing Rituals

In addition to understanding how Hindu stakeholders connect with climate change, our second goal was to identify rituals that Hindu devotees perform as acts of prayer and transform them into game mechanics. We identified seven rituals in total and converted each into a digital mechanic, as detailed below.

- **Chanting:** Along the hike and while waiting in queues, devotees often chant mantras in praise of the deity. Temple authorities play these mantras on loudspeakers throughout the hiking path, encouraging collective chanting, known as 'Bhajans'. Figure 4 (e) illustrates group of scholars chanting. To digitize this ritual, we used Whisper (a text-to-speech AI model developed by OpenAI [65]), allowing players to record their chanting of mantras as part of the game.
- **Breathing:** Controlled breathing and meditation were commonly observed along the hike and in the temple areas, as shown in Figure 5 (a). After completing their "Darshan" (worship of the temple deity), many devotees meditate with deep, controlled breathing within the temple premises. In the evenings, large groups of devotees, often with families, gather to meditate together. To create a digital version of this ritual, we used a microphone to detect breathing sounds. The associated code is available in our supplementary files.
- **Mudras:** While meditating or praying, devotees often make various hand gestures, known as mudras, each associated with specific deities (illustrated in Figure 5 (c),(d)). These gestures are performed in a sequence, often accompanied by soft chanting. We digitize this ritual using Google Teachable Machine [66] to

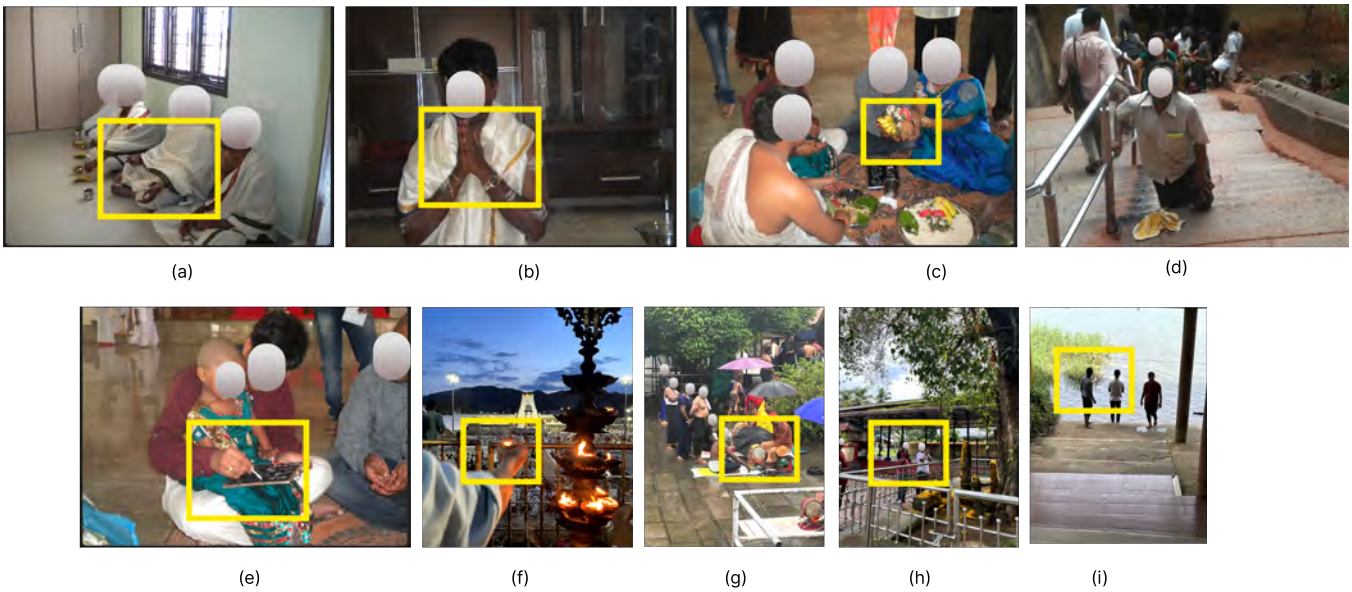



**Figure 5: (a) Devotees executing breathing rituals, (b,c) Devotee praying with a hand gestures, (d) Devotees participating in inscribing rituals, (e) Devotees engaging in fire/light rituals, (f) Devotees playing musical instruments, (g,h) Devotees praying to personified nature elements (trees, rivers)**

create computer vision models trained to recognize these mudras. These models are included in the supplementary files.

- **Holy Book Reading:** Reading holy books, such as verses from scriptures or the Gita, was a common sight (Figure 4 (e)). At Tirumala, where waiting times can exceed 8 hours, devotees read these texts to remain engaged in prayer while in line. To digitize this ritual, we used Whisper [65] to let players read aloud scriptures connected to different climate gods and natural elements.
- **Inscribe:** As shown in Figure 5 (e), devotees of all ages inscribed holy words on boards, rice, and books. Some wrote a single holy word, while others repeated it multiple times. We observed dedicated stations where devotees could leave books filled with these writings as offerings. This ritual was digitized as a mechanic for players to inscribe sacred words within the game.
- **Musical Instruments:** Devotees and temple authorities often play instruments in honor of the gods within the temple grounds. The instruments, including trumpets, drums, and other local varieties (illustrated in Figure 5 (g)), are played periodically, such as in the morning as a wake-up call for the gods or in the evening as a night song. To digitize this ritual, we recorded various instrument sounds, which are available in the supplementary file.
- **Arati/Fire/Light Worship:** One of the most common rituals observed was "Arati," where devotees offer fire or light as a form of worship (illustrated in Figure 5 (f)). During Arati, devotees move ignited camphor around the temple or the idol, ending the ritual by offering prayers to the fire as a manifestation of the deity. We digitized this ritual using computer vision algorithms to detect light, shared in detail in the supplementary file.

## 6 Game Design Step: Iterative Design of Shloka

With various rituals digitized and connections between Hindu stakeholders and climate change observed, our next step involved iteratively developing and testing different game narratives and input methods to create a game that links climate change to Hinduism.

For this we used a co-design based approach, where we worked with religious scholars, players and as researchers took on the role of designers and developers (refer author Positioality in Section 3). In our first iteration, we adopted a role-playing approach inspired by Rickien's [22] climate RPGs. As shown in Figure 6(a), players assumed the roles of Hindu deities (e.g., Indra, god of rain, or Vayu, god of wind), using digitized rituals—such as chants and mudras—to cleanse forests, oceans, and rivers, and to combat pollution-causing demons, thereby replenishing their powers.

However, consultations with religious scholars (Figure 6 (b)) and relevant literature [67, 68] revealed two key concerns. First, depicting gods as defeatable or needing to replenish powers was considered controversial, given their omnipotence. Second, allowing players to control these deities was seen as disrespectful, conflicting with beliefs about their supreme nature. Consequently, we revised the narrative to respect religious sensitivities.

In response religious scholars' insights, we introduced a new protagonist named "Shloka," a chosen child with a mission to remove elements harmful to the climate. Shloka's journey educates players about climate preservation without portraying Hindu deities in vulnerable or controllable roles. This shift emphasizes a combat-focused experience, where Shloka eliminates pollutants and other threats to the environment. By embodying Shloka, players engage with digitalized ritual mechanics – such as chants and mudras – while confronting environmental degradation.

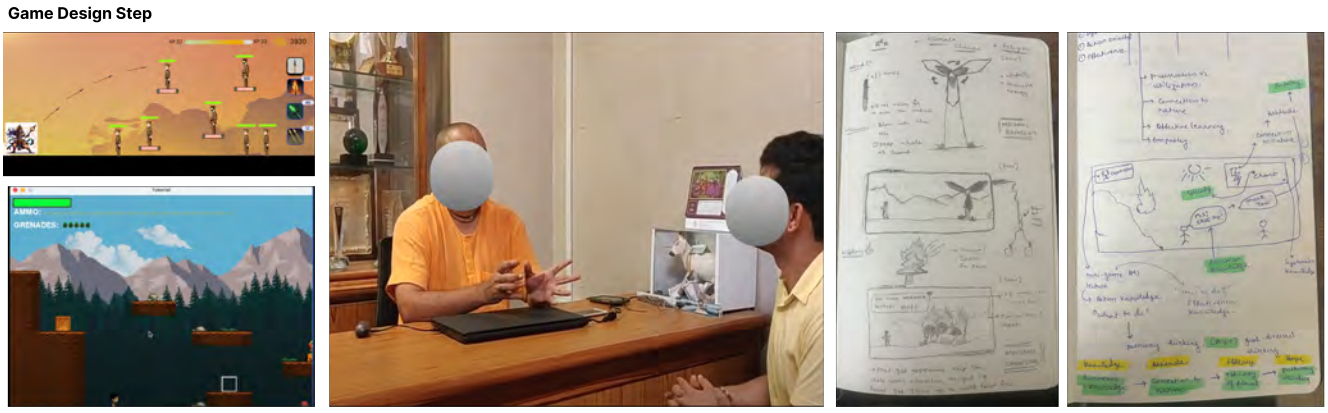



**Figure 6: (left) First prototype with Ammo and weapons, where climate enemies were being taken down, we discussed with cultural stakeholders to understand and iterate (middle) A prototype version where players take the role of climate gods (right) The final prototype document with the character Shloka and integration of IGDA framework.**

**Table 1: Stages Across Levels (in Shloka) in Relation to Religion, Climate and Rituals**

| | Knowledge Stage | Attitude Stage | Efficacy Stage | Hope Stage |
|---|---|---|---|---|
| 1 | The use of fossil fuels pollutes the environment. | Invokes Hanuman with the help of **chanting rituals**. | Grows in size to fix large windmills **supporting renewable energy**. | Hanuman provides **pathways for alternate fuels** in temple towns to reduce carbon footprints. |
| 2 | Trash and garbage left behind by devotees in temples. | Invokes Goddess Kali with the help of **music instrument rituals**. | Gains multiple hands to **segregate waste efficiently**. | Goddess Kali advises devotees on **proper disposal practices** in temple towns. |
| 3 | Oil pollution in the Holy Ganges from floating diyas. | Invokes Lord Varuna by **inscribing his Holy name**. | Gains a magical trident to **absorb oil and clean the river**. | Lord Varuna suggests eco-friendly materials for rituals. |
| 4 | Smog and fog in holy sites on hilltops. | Invokes the Sun God through **light/fire rituals**. | Gains a sunlight generator to identify **and filter vehicle pollution**. | Lord Surya **encourages EVs** to reduce forest petrol/diesel usage. |
| 5 | Garbage piles on holy beaches and islands. | Invokes Matsya (fish god) **through hand mudras**. | Gains the ability to swim into ocean depths to **collect garbage**. | Matsya advocates for clay idols and natural dyes. |
| 6 | Toxic fumes and polluted water in Yamuna. | Invokes Vayu (the wind god) **through meditative breathing**. | Gains the ability to **blow away toxic fumes over the river**. | Vayu **calls for reduced deforestation** and seasonal balance. |
| 7 | Forest fires across holy hills and temples. | Invokes Indra (the rain god) **by reading holy books**. | Gains the ability to **generate soothing rains**. | Indra promotes **forest fire prevention and management** in holy towns. |

Further discussions with scholars revealed that the game's combat elements conflicted with Hinduism's peaceful and spiritual values, which emphasize harmony and respect for all beings, including nature. This contradiction led us to question whether combat, even

when metaphorical, was appropriate to convey environmental responsibility within a Hindu framework. Consequently, we refined the mechanics to align more closely with the Hindu philosophy's non-violent principles while retaining a focus on climate action. During the playtests, participants noted that combat overshadowed the climate change emphasis, and the ritual required to gain ammo disrupted the platformer-style gameplay flow.

To address these concerns, scholars recommended re-imagining the Hindu gods as mentors to Shloka, who would invoke their wisdom through rituals to gain insights into climate action. This approach respects religious sentiments by avoiding any portrayal of the gods in controllable or vulnerable roles. Building on this feedback, we adopted the IGDA Climate Special Interest Group's four-step framework for creating climate-focused games [69]. This framework, which emphasizes **knowledge**, **attitude**, **efficacy**, and **hope**, is designed to inspire pro-environmental action among players by fostering a deeper understanding of climate issues and promoting positive attitudes and effective responses. Each level of our game is structured around these pillars, aligning with game-based environmental education (GBEEs) [69, 70] to foster deeper climate understanding and pro-environmental action among players.

In the **Knowledge Stage**, IGDA recommends imparting knowledge about the current climate situation. In the game Shloka, a god-mentor (see Figure 1) imparts essential knowledge about various climate disasters and the repercussions of poor climate management to holy sites and world. This stage aims to raise awareness and provide foundational knowledge about climate issues. Moving to the **Attitude Stage**, IGDA highlights the importance of players feeling a 'connection to nature' as critical for developing a climate-positive mindset. By performing rituals that invoke climate gods, players develop a sense of unity with nature, aligning with IGDA's emphasis on fostering a connection to the environment. This reflective stage encourages players to perceive their actions as interconnected with the natural world. Further, using the six connections between Hinduism and climate change (Section 5.2) we hope to emphasize the connectedness between Hinduism and Climate action.

The IGDA terms the **Efficay Stage** as a stage that enables players to feel suited to fix the climate in the gaming context. In the game, players invoke a climate god, gaining special abilities that empower them to address environmental hurdles within the game. This stage reinforces a sense of capability, helping players feel more effective in responding to climate issues. Finally, the **Hope Stage** aims to inspire optimism by providing pathways for positive climate action. After overcoming a climate disaster, the invoked climate god suggests actionable steps for reducing one's climate footprint (pathway thinking) and shares examples of contributions by the religious community towards climate action (social trust). This stage aims to instill hope by showing that both individual and community efforts can have a meaningful impact.

## 6.1 Shloka - The Game

With the narrative framework finalized, we developed a game consisting of seven levels, each following the structure depicted in Figure 7. Inspired by Section 5.2.1, the second level in the game, emphasizes the impact of pollution in forests which are deemed holy and are often personified. During the knowledge stage of this level, Shloka (the player) is guided by the Hindu deity of education, who explains the consequences of polluting forests and harming ecosystems (Section 5.2.5).

In the attitude stage, the game encourages a sense of connectedness to religion and its connection to climate deities (Section 5.2.2). Here, the player performs a digital ritual to summon a climate god. Specifically, in level 2, the player must complete the ritual of "playing musical instruments", as outlined in Section 5.3. This ritual calls upon a deity (Figure 7) who grants the player powers to address climate challenges within the game.

In the efficacy stage, the player, now equipped with new powers, must complete a task to combat the climate issue presented. This task positions the player to actively restore the environment in the game context. As shown in Figure 7, after invoking the climate god, the player gains the ability of "multiple arms" to help the player segregate waste and reduce the trash pile blocking the temple path as illustrated in Figure 7,

Finally, in the hope stage, the invoked god provides the player and their community with guidance on positive actions. Figure 7 illustrates how the climate god advises devotees on managing pollutants near temples, thus educating the player and inspiring them to advocate for similar practices within their own community (Section 5.2.6). Although a brief overview of each level is provided in Table 1, to play each level, we recommend visiting https://siddu1998.github.io/Shloka/, or watching the video in the supplementary files or reading our game demo paper [71].

# 7 Game Evaluation Step: Playtesting and Comparing with Game Corpus

## 7.1 Establishing a Baseline Game corpus

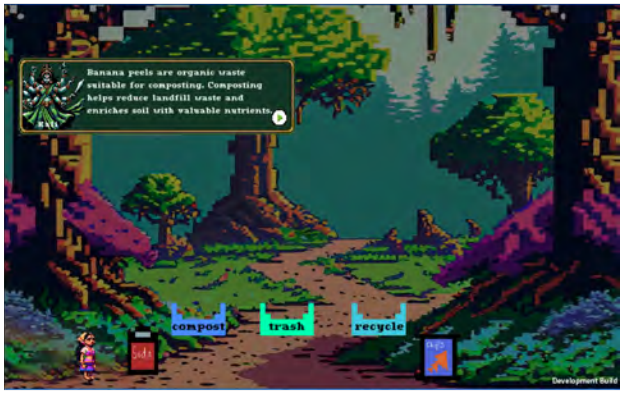
To evaluate the effectiveness of our religiously themed gameplay we compared it against other climate change games. First, we established a baseline of climate change serious games, each with distinct mechanics, to compare against our game. The term "mechanics" is vaguely defined in serious games and often has varying interpretations. We ground our definition of a mechanic to our research goals. Our paper aims to evaluate whether the use of rituals results in greater gameplay experience and cultivating interest around climate change. Here rituals act as an "interaction mechanic". In that context, we define mechanics as the core systems of player interaction i.e. the actions/verb players can take in a game [72].

To include games into our baseline, we set the following inclusion criterion. First, a playable version of the game must be available either on Mobile or PC. Second, the game must be associated with climate change learning and climate action. With these two conditions, two researchers searched for games in the Google Playstore, Apple Store, Google Scholar, Games for Change database and Web Search (Google) with the query terms, "Climate Change Games", "Climate Change Serious games". We identified a total of 41 games as shown in Table 2. The researchers classified the games according to the interaction the game offered. The classification of games was guided by the answer to the phrase "The player in the game ..." i.e. "What is the verb the player does while playing the game?". This approach allowed to constraint the definition of mechanic to how players interact to progress in the game.


**Knowledge Stage (Level 2):**
The IGDA framework recommends, this step to provide players essential knowledge about climate change and its impacts. In this level, Ganesha teaches the player about how increasing devotees are polluting the holy forests, which in turn disturbs wildlife, eco-systems.


**Attitude Stage (Level 2):**
The IGDA framework recommends this step tp provide players a connection with nature. In this level, the path of Shloka is blocked and can not continue in her pilgrimage due to increasing land fills and un-recycled trash. The player develops a connection with to a climate change god by performing a ritual.


**Efficacy Stage (Level 2):**
The IGDA climate change framework recommends this step to provide agency to players to impact climate action. In this level, the ritual invokes the goddess Kali and provides the player with the power "multiple-hands". The player here is tasked to clear the quickly sort the trash pile, using the multiple hands a power gained. (See how the trash pile blocking on the road is gone, as the player has sorted it during gameplay)




**Hope Stage (Level 2):**
The IGDA climate change framework recommends this step to provide future pathway thinking for positive climate action. In this level, the player is educated how trash often found in temple complexes can be categorized effectively and keep the holy forests safe.

**Figure 7: Different scenes from Level 1 in the game Shloka. Other levels adopt a similar structure.**

## 7.2 Understanding the Baseline

As shown in Table 2, we identified nine categories of climate change-related serious games. From each category, we randomly selected one game to include in our baseline corpus.

The first category consists of quiz games, where players must choose the correct answers to progress in the narrative. The second category includes games where players are tasked with ensuring the survival of their character or city by solving climate-related puzzles or optimally allocating resources. The third category comprises platformers, where players collect various items as part of the gameplay.

The fourth category consists of interactive narratives, where players are presented with choices at each scene that influence the direction of the narrative and teach various aspects of climate change based on their choice.

The fifth category includes games where players scan objects, such as augmented reality (AR) and virtual reality (VR) games. The

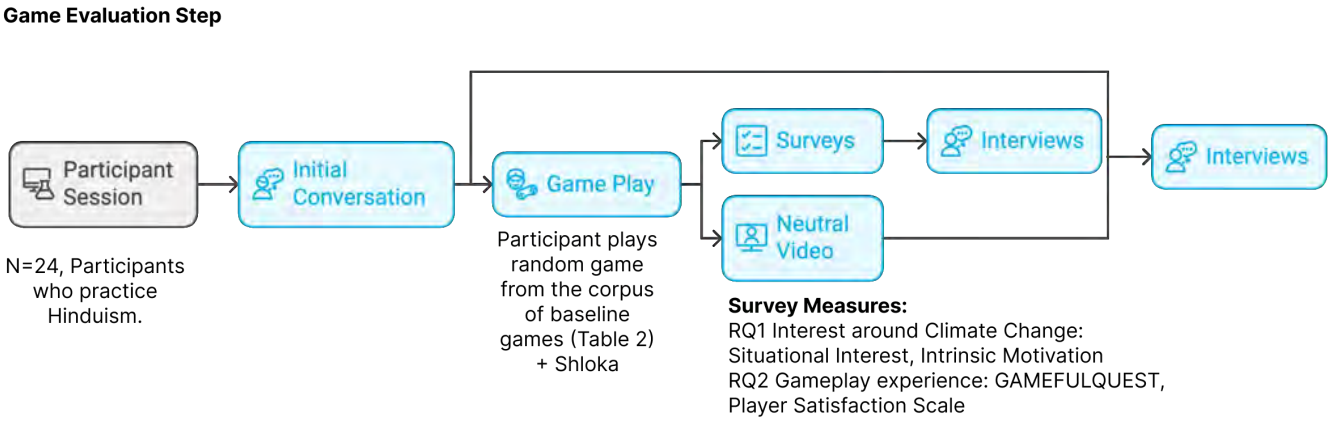



**Figure 8: Various steps involved while evaluating Shloka against the corpus**

**Table 2: List of Climate Change Related Games Categorized by Player Actions. Games marked in bold are games part off our baseline corpus to compare against Shloka**

| The Player in the game ... | Games |
|---|---|
| Chooses the right answer (Quiz Games) | Climate Trivia Game [73], Marco Polo Weather [74], **ClimarisQ** [75] |
| Strategizes for optimal solutions (City Growth/Puzzle/Riddle Games) | Climate Crusade [76], Deal: A Green New Election [77], Beecarbonize [78], Escape Room Climate Change Game [79], **Human** [80], Idle Of Carbon City [81] |
| Runs and Collects Items (Platformer/Runner) | Reset Earth [82] , Life of Pika [83], DOMINO The Little One [84], Climate Wars [85], **Climate Changer** [86] |
| Navigates a Narrative (Interactive Narrative Games) | **Illuminate**[87], Comando Gioseppo [88], Climate Quest [89] |
| Scans Objects (AR/VR Games) | **H2O - An Ocean of Science (AR)**[90], Sea Level Rise Explorer [91], Climate Connected [92], Monstrash [93] |
| Adjusts Climate Parameters (Simulation Games) | Climate Time Machine [94], Terra Nil [95], **Coral Bleaching** [96], Imagine Earth [97], Save The Earth [98], Reef Hero [99] |
| Attacks Climate Enemies (Action) | Life Bubble - My Little Planet [100], **Mother Nature** [101], Fate of the World [102], Clean the Ocean [103] |
| Cleans Items (Hyper-Casual Games) | Carbon Chaos [104], Eco Earth [105], Hazel: Tap Away Climate Change [106], **Crabby Claws** [107], Trash Monster[108], Last Bottle [109] |
| Uses language (Word/Vocabulary Games) | **Word Wall - Climate Change**[110], Climate Change Word Search [111], Esol Climate Change Word Search [112] |

sixth category features simulation games, where players adjust climate parameters to achieve specific objectives.

The seventh category focuses on more aggressive gameplay, where players shoot or eliminate "climate enemies" to protect nature. The eighth category consists of hyper-casual games, where players collect trash or form patterns (e.g., three-in-a-row or four-in-a-row) to remove pollutants. Finally, the last category involves games that require players to use words and vocabulary to progress through the game.

To explore whether incorporating religious themes as interaction mechanics and narrative elements increases engagement, interest, and immersion in climate change games, we employed a mixed-methods approach. We conducted playtests, surveys, and semi-structured interviews to gather insights into player perceptions and the impact of religious themes on their experience. In the subsequent sections, we discuss the various measures used in the evaluation process, the procedure, and the participants.

## 7.3 Measures

Assessing gameplay experience is crucial because the effectiveness of educational or persuasive games largely depends on how engaging and enjoyable they are for players [113, 114]. In the context of climate change games, an engaging gameplay experience can help players better understand complex environmental issues and motivate them to consider their own actions [70, 115]. For this, we adopted the GAMEFULQUEST [116] survey. Hogberg's [116] illustrates how the GAMEFULQUEST survey captures various dimensions w.r.t serious games in the context of climate change. The survey has seven dimensions "Accomplishment", "Challenge", "Playfulness", "Guided", "Competition", "Social Connection", and "Immersion". To compare the "Satisfaction" of gameplay, we used the Player Experience of Needs Satisfaction (PENS) scale [117], which assesses "Competence," "Autonomy," and "Relatedness".

We then evaluated the impact of our game on generating interest and fostering intrinsic motivation around climate change [118]. Situational interest refers to the temporary spark of curiosity or participation elicited by specific stimuli, such as game content, which can lead to increased attention and willingness to learn [119]. Intrinsic motivation involves engaging in an activity for its inherent satisfaction and personal relevance, rather than external rewards [120, 121]. For this, we used the Intrinsic Motivation Survey [122], followed by the Situational Interest Survey. We administered all the measures after participants played each game from the corpus.

## 7.4 Participants

We conducted a statistical power analysis to determine the appropriate sample size for our within-subjects study, where participants play 10 games and complete surveys after each game (as discussed in Section 7.3). As with previous work with immersive media [116, 123, 124], for a repeated measures ANOVA, we assumed a medium effect size ($f = 0.25$), a significance level of $\alpha = 0.05$, and a power of $1 - \beta = 0.95$ [125]. The required sample size for a repeated measures ANOVA was calculated through $G^*$power and was found to be 20 (Refer Figure 12).

We recruited 24 participants (15 male, 9 female) aged between 20 and 55 years (M = 28.3, SD = 9.9). All participants self-identified as practicing Hindus, a criterion verified during the recruitment process. To ensure that the study accounted for diverse perspectives, participants were recruited from varying levels of religiosity. Religiosity was measured using the Santosh-Francis Hinduism Religiosity Scale [126]. While the scale includes multiple questions to assess religiosity, a straightforward indicator was the 16th question: "Are you religious?" Based on their responses, 5 participants reported a score between 1–3, 6 participants a score between 3–5, and 13 participants a score of 6 or 7 (with 7 indicating highly religious), indicating a distribution among the levels of religiosity within our sample. All 24 participants completed the surveys, and 14 participants also took part in extensive follow-up interviews.

We recruited participants from UCSC and Thapar University, Hindu temple groups, and set up a stall at a Hindu religious gathering (Figure 9 illustrates participants playing Shloka). The participants volunteered in the study with an interest in exploring Hindu media artifacts. They were not compensated monetarily but were provided with holy food offerings, Hindu holy books, and other merchandise in exchange for their participation. Given the bilingual nature of the participants, we had some responses from the participants in Hindi, Telugu, Marathi along with English. We did not need to consult external translators, since three researchers have one of the three languages as their first language and have studied in English instruction schools for over 18 years (at minimum).

## 7.5 Procedure

Each participant attended a three-hour session designed to understand how they interacted with rituals, reflect about climate change and asses their interest around climate change. As illustrated in Figure 8, the session began with an open-ended conversation about climate change with the participant.

To ensure randomization and prevent selection bias, games presented in Table 2 were assigned to participants through a Latin squares method [127]. After completing each game, participants filled out two surveys as discussed above: the first capturing player experience, and the second capturing intrinsic motivation and situational interest around climate change.

For participants, taking part in the semi-structured interviews, gameplay sessions were recorded and later shown to the same participants during qualitative semi-structured interviews. These interviews focused on participant reflections about their gameplay, insights gained regarding climate change, and feedback on game mechanics and narrative elements.

To prevent carryover effects between different games, all participants watched a three-minute neutral video after each game. This method aimed to reset their cognitive and emotional state before proceeding to the next task, a technique that has been employed in previous studies to minimize the influence of prior tasks on subsequent ones [128, 129].

## 7.6 Analysis

Our surveys consisted of questions in the form of a likert-scale. Given we take a within-group study design, and Likert data is ordinal in nature, we employed Friedman tests for repeated-measures comparisons across 10 games. Whenever the Friedman test indicated a significant overall difference, we followed up with post-hoc Wilcoxon signed-rank tests to compare Shloka against each of the other nine games. We refer to these values when applicable in Section 8. Further, for interested readers, we have published comparisons per game, with Shloka on different parameters in Appendix B.

For the interview analysis, three researchers adopted a grounded theory approach [130–132]. One researcher initially marked key events in the interview transcripts. Considering the two research questions, The researchers independently developed codes, then met multiple times to discuss and refine them, ultimately establishing a finalized codebook (Figure 10 and 11), discussed in Section 8 under each of the research questions. Using the codebook the researchers coded the events, and reached an accepted Inter-Reliability rate of 0.76 [130]. Throughout our discussion and results, we will refer to both the qualitative quotes along with statistical insights to understand the impact of using religion both in terms of gameplay and cultivating interest around climate change.

Player executing the Holy word writing ritual | Player executing the breathing ritual | Player executing the Hand gesture ritual | Player executing the chanting ritual

**Figure 9: Participants trying out various Rituals, while playing the game Shloka**

## 8 Results

### 8.1 RQ1: How does the integration of religious rituals and narratives in a serious game enhance players' reflection and interest in climate change?

Our first research question aimed to understand how the use of religion in video games shaped participants' interest in and perception of climate change. We identified five themes, as illustrated in Figure 10, which are discussed below.

*8.1.1 Climate Ethics Through a Religious Lens:* A key objective of the knowledge stage in Shloka was to encourage players to critically consider how certain religious actions might unintentionally contribute to climate change. By connecting religious narratives with climate ethics, this stage aimed to highlight that caring for the environment is not merely a scientific responsibility but also a moral and spiritual one. After completing this stage, participants described how Shloka fostered a heightened awareness of ecological sanctity through a cultural and religious lens. Participant P2 illustrated this perspective by drawing parallels between established religious practices and environmental stewardship:

> *"What I can see is a reminder for myself or maybe any player to treat the climate as holy. For example, since I was a kid, if we ever touched a book or paper with our feet, our parents told us to seek forgiveness, because a book represents Goddess Saraswati and is holy. It's something similar here. Ganesha in the game is right, the Ganges is holy and devotees, the government, should treat it that way."*

This reflection shows how Shloka reframes environmental care as a sacred duty, linking familiar religious customs to broader ecological ethics. Participant P11 extended this idea by emphasizing the concept of "Ahimsa"—non-violence or peace—highlighting how Shloka could promote a form of "Climate Ahimsa":

> *"Hinduism stresses ahimsa, and it's explicitly said to treat nature as holy. We literally have a goddess for Earth—Bhudevi—so it's basic to understand that Bhudevi must be treated non-violently, and Shloka is getting at that aspect. This is what makes it different from other games. Other games make it like, 'save yourself by protecting the climate.' But here, Ganga is a person, Vayu is a person, so the game elevates the idea to treating someone ethically, which I am more likely to do."*

By framing rivers, wind, and the Earth as sacred entities, Shloka encouraged players to view climate action as a moral and spiritual relationship with nature rather than mere self-preservation. This novel perspective motivated participants to explore Shloka further. The situational interest survey assessed "NOVELTY" and "EXPLORATION INTENT," where Shloka outperformed other games. As tests of normality (Shapiro–Wilk) and homogeneity of variance (Levene's test) indicated non-parametric data, a Friedman test (on the aggregate scores for each question under each parameter) was conducted. Results showed significant differences in "NOVELTY" across games, $F(9, 210) = 19.45$, $p < 0.001$, with Wilcoxon tests confirming Shloka's superior novelty. Similarly, for "EXPLORATION INTENT," Friedman test results indicated significant differences between the games $F(9, 210) = 23.7$, $p < 0.001$, and Wilcoxon tests confirmed that Shloka elicited greater situational interest, prompting participants to explore the game world and its climate change themes. For detailed, results of the Wilcoxn tests, please refer Appendix B (Table 5).

*8.1.2 Relating to the Consequences of Climate Change:* In the game Shloka, participants engaged with climate change scenarios uniquely tied to temple towns and sacred religious sites. As outlined in Table 1, Level 3 focuses on the deteriorating state of the Ganges, revered as the holiest river in Hinduism, while Levels 4 and 7 address pressing issues such as forest fires and smog in the temple town of Tirupati. This contextualization prompted participants to reflect on the tangible impacts of climate change in locations they have visited and hold in high esteem. Unlike traditional games or media, which often emphasize distant or abstract consequences of climate change—such as melting glaciers, polar bears, or coral bleaching in regions like the Arctic or Australia—Shloka personalizes the narrative by situating these effects within familiar and culturally significant spaces.

Participants expressed how this grounded approach transformed their perception of climate change from a distant, abstract issue to an immediate and tangible reality. Participant P1 remarked:

> *"I watched a few documentaries on climate change; most of them just talk about the Arctic Circle melting, polar bears, glaciers. Which is fine, and I am sad. Even the other games, like one where it shows water level here in Chittorgarh, it's nice to see that, oh, the fort here will be underwater at the end of climate change (refers to H2O AR Game). But still, other games like the coral bleaching one also show a reef, which I don't think I will ever*

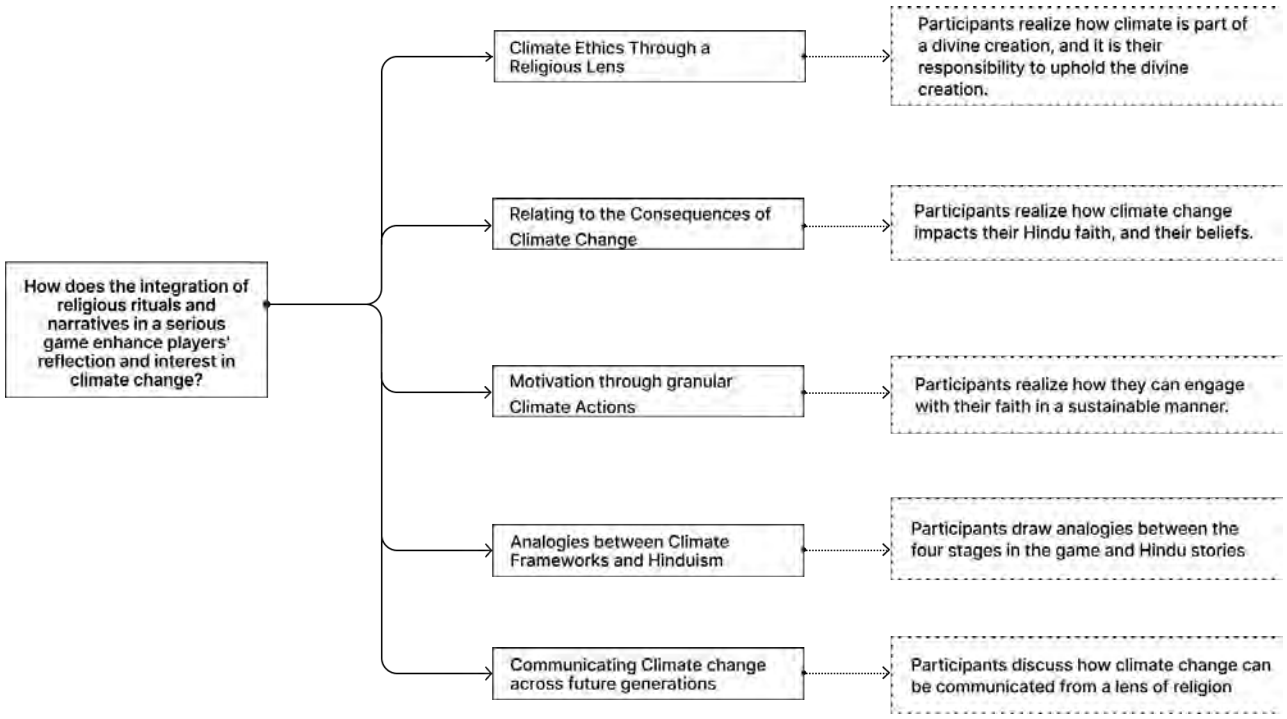



**Figure 10: Various ways Shloka impacts participants with regards to Climate Change.**

*visit. However, Shloka shows places I know, I have visited, and it's sad to know not 100 years but actually now these holy places are being destroyed. Most games show an apocalyptic age, which I feel is unrealistic; however, this (Shloka) is real."*

Participant P4 added:

*"I recently watched a cricket match, which was a charity event for forest fires in Australia; [...], like we hear about them even though we are in India. While the scale of destruction is fractional, forest fires happen even in Tirumala, Srisailam, but it hardly gets covered by news, and no one cares to explore why they happened. However, compared to other games, the level I was reading Bhagwat Gita touched upon the forest fires, which is interesting."*

These insights highlight Shloka's ability to make climate change relatable by leveraging players' cultural and emotional connections to these sacred sites. Our survey, measured "RELATEDNESS" and echoed a similar finding. A Friedman's test indicated significant differences in "RELATEDNESS" across games, $F(9, 210) = 17.080$, $p < 0.001$, with Wilcoxon tests confirming Shloka's superior ability to invoke relatedness as highlighted in Table 6 in Appendix B.

*8.1.3 Motivation through Granular Climate Actions:* Participants noted that Shloka offered actionable, contextually relevant climate solutions by embedding them within culturally resonant narratives and rituals. Unlike conventional climate change games that often present generic guidelines, Shloka communicated god-sent messages and sacred practices to frame environmental actions as devotional acts. This approach reimagined climate care from a mere civic obligation into a spiritually rooted engagement, forging a deeper emotional bond with the issues at hand and providing greater motivation to contribute towards climate action. .

Participant P6 captured this sentiment when discussing how the game's forest fire level encouraged mindful disposal of camphor:

*"We are not a god fearing group, we are a god loving group, and sometimes we need to be told how to love and care—in this case love and care for nature. This game helps in realizing that. For example, in the forest fire level, the message is simple, just be cautious while disposing with camphor in forests. I see this as two rituals, pleasing the god and taking care of the god, and we should definitely put this narrative out to make people realize."*

Participants also acknowledged the practicality of Shloka's suggestions. Rather than providing abstract, one-size-fits-all strategies, the game focused on culturally tailored, feasible actions. Participant P2 contrasted these specific steps with generic advice that rarely applies to everyday life:

*"It is November right now, and see how hot it is, so the whole 'do not use the AC' does not apply to me. [...] And 'do not cut trees' is useless advice, because why would I pick an axe and chop trees? These are just textbook suggestions. But disposing of fireworks carefully after Diwali, or not spilling oil in the river when I put my diya—these are things I can work on. These are workable stuff."*

Our survey indicated that participants reported greater intrinsic motivation [117] after engaging with Shloka compared to other games. The intrinsic motivation survey measured two key aspects: "INTEREST" and "USEFULLNESS". A Friedman test on the summed scores revealed significant differences in the interest generated by

Shloka across games, $F(9, 210) = 10.78$, $p < 0.002$, with Wilcoxon tests confirming Shloka's superior ability to invoke interest with regards to climate change as highlighted in Table 5 in Appendix B. Similarly, the Friedman test revealed significant differences in the perceived usefulness of the games, $F(9, 210) = 13.49$, $p < 0.002$ and a Wilcoxn test confirming how Shloka was perceived to add more value with regards to climate change compared to other games in the corpus, as indicated in Table 6 in Appendix B.

*8.1.4 Analogies with Core Hindu Principles and Climate Framework:* Shloka was designed following the IGDA framework for developing games on climate change, as outlined in Section 6. Participants highlighted the game's strong alignment with this framework, frequently drawing analogies with Hindu narratives and philosophies. This aligns with research indicating that culturally specific content enhances engagement and relevance, as seen in prior studies on serious games [133]. Participant P3 shared an illustrative comparison:

> *"This game is a bit like the Bhagvat Gita. This game follows a similar pattern; for instance, Lord Krishna first explains Arjuna Adharma (the bad state of the world due to sins), then reveals his true Godly form (Lord Vishnu) to instill confidence in Arjuna, and then Arjuna defeats many perpetrators of Adharma (Kauravas), resulting in a brighter future. In this game, Ganesha initially illustrates the bad things happening to climate (Knowledge Stage). A god reveals himself helping the player (Attitude Stage), and then this leads to good things to climate (Efficacy Stage). I know it might be a stretch, but there is some alignment."*

This analogy reflects Shloka's ability to resonate with core Hindu ethos, particularly the role of divine figures in safeguarding nature. Research underscores how integrating cultural narratives fosters emotional investment and ethical reflection in players [134]. Participants also engaged deeply with the'Hope Stage," linking it to their personal experiences and concepts like "pathway thinking," often discussed in behavioral change literature [135]. Participant P5 observed:

> *"It is nice to see Ganesha kind of guide through various causes of climate change. My family recently started using only Mud/Clay based idols during Ganesha Festival, and I saw that in level where we need to clean the river, at least I am doing one of the recommendations from Matsya."*

This reflection highlights how culturally relevant games like Shloka serve as a bridge between abstract environmental concepts and actionable behaviors rooted in players' lived experiences. Beyond reinforcing existing practices, participants discovered actionable insights from a religious lens, Participant P9, provided a specific examples:

> *"While I was inscribing, it reminded me of the Ramayana, and the effective story of Ramayana was to have good take over evil. This game is also similar, we have some evil ways in how we treat climate this is not god, and we need to let good practices take over, honestly most Hindu stories are the same and this game is a nice wrap around that reminding us to do good for climate."*

Participants further emphasized how Shloka differs from other climate change games by offering takeaways that are deeply rooted in cultural and community-specific contexts. Generic game mechanics, by contrast, often fail to resonate. Participant P1 compared Shloka to a simulation game:

> *"In the game Human you are essentially choosing what devices to turn on, what to eat, and simulating the Human's life to make things survive long. As a Hindu Brahmin, I am strictly vegetarian (so global warming because of cows and poultry), these do not even apply to me. However, knowing how to protect Tirupati is something I can take and consider. Like reading the Gita in the last level to cause rains to cool the Tirumala fire almost feels like taking an oath."*

*8.1.5 Communicating Climate Change across generations:* Participants acknowledged that respect and ethical treatment for natural elements—rivers, mountains, and oceans—has not always been effectively communicated to younger generations. Shloka illuminated how religious teachings could encompass the sanctity of nature as well as human relationships. Participants who were parents, reflected how Shloka could provide a valuable opportunity for their kids. Participant P13, reflecting on their role as a parent, noted that traditional morals emphasize respect for people rather than explicitly framing natural elements as sacred:

> *"This country and society are often grounded in the teachings of holy books. 'Maatru devo bhava, Guru devo bhava, Pitru devo bhava' (Treat mother as god, father as god, teacher as god) is essentially why most of our society respects parents, elders, and teachers as gods. I taught it to my son, and of course he treats everyone ethically and respectfully, but I realize now that I never taught him how a river is holy or a mountain is sacred. He would never know. It's a good realization for me as a parent. It's not like it's not in the Vedas; the ocean is born from Vishnu, so somewhere we have a duty."*

Participant P10 reinforced the idea that instilling environmental reverence should begin early, ideally woven into religious and moral education, and games like Shloka would be helpful:

> *"See, it starts at a very foundational level to learn what needs to be valued and what not. Religion plays a huge role in deciding the morality of treating something in a certain way. And those morals to treat climate ethically have to happen early. We never teach it, at least from a parental perspective, I am not a parent yet, but when I am atleast. This game is like hitting two birds with one stone; I want my children to engage with our faith but also learn about climate, so this serves a dual purpose."*

## 8.2 RQ2: How does the integration of religious rituals and narratives in a serious game influence engagement and player experience?

Our second research question aimed to understand how the use of religion in video games shaped player experience. We identified four themes, as illustrated in Figure 11, which are discussed below.

*8.2.1 Religious Rituals and Narratives create an Immersive Experience:* In Shloka, participants were required to physically execute rituals, with their correct execution directly influencing in-game

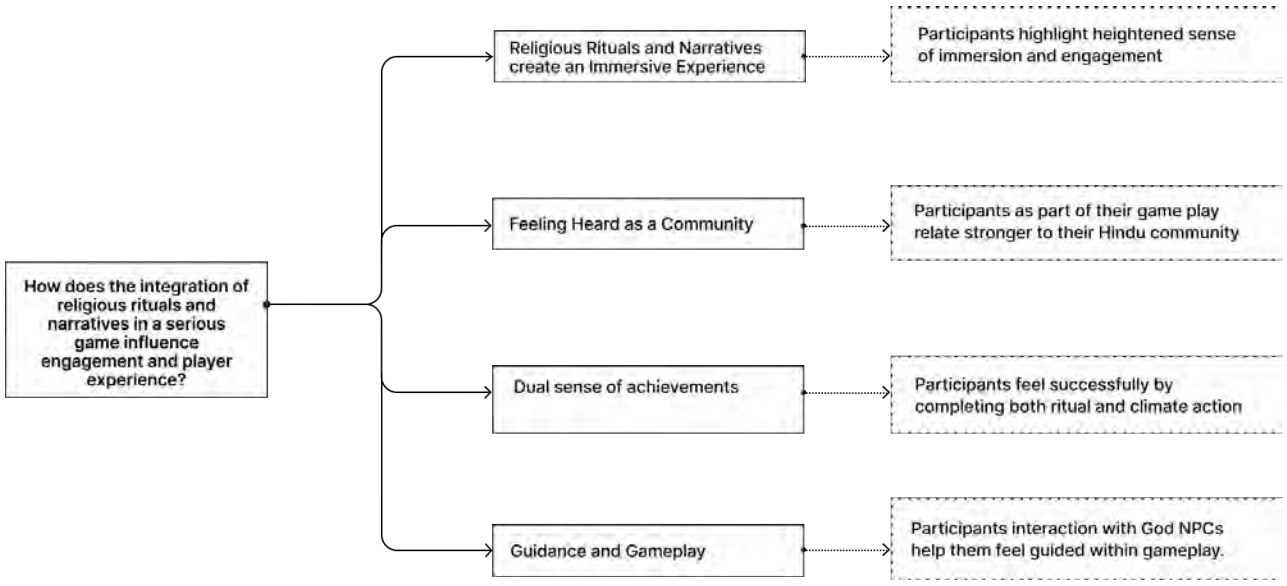



**Figure 11: Various ways the use of Religion impacts Player Experience**

outcomes. This tangible interaction enhanced the sense of immersion, as players felt a deeper connection between their actions and the game's progression. Participants noted that the physicality of performing rituals added a layer of and engagement, making the experience more immersive compared to other games. Participant P14 shared their perspective on how Shloka stood out from other games in terms of keeping their attention and having them immersed in the game:

> *"In other games, the outcome is pretty expected, like I scan and I know how much I am going to drown, or I choose a wrong answer I know it's game over. It's the being on your toes part which these games lack; however, in Shloka my back was straight I know what I am specifically doing, like ritual which makes it more immersive, and engaging."*

Participants also emphasized how the use of religious narratives in the game helped sustain their interest and presented the issue of climate change in a novel way, encouraging them to pay closer attention. The integration of mythology sparked curiosity and offered a fresh perspective on climate-related challenges. Participant P9 explained how the combination of myth and ritual added an element of intrigue:

> *"The myth, around the movie in Kalki is what makes it interesting, the magic you know. It's the same thing (with Shloka), [....] the curiosity of what magic power through which ritual and god, what my doing can effect the climate in the game is interesting."*

Participants found that engaging with the rituals helped them rethink their relationship to both faith and environmental responsibility. Participant P10 observed that while knowledge of a religion may remain theoretical, rituals transform this understanding into active practice. They noted:

> *"Rituals serve as the bridge between just knowing a story in the religion and practicing the religion. They help you establish continuity and responsibility. In this case, climate change needs a continuous effort and responsible effort and adding a ritual to enable this leaves a lasting impression."*

This emphasis on practical engagement resonated with other participants, who highlighted how rituals like writing holy words on stones—practices often associated with oceans—could anchor environmental messages more firmly in their minds. Participant P3 explained that performing a ritual, followed immediately by addressing a climate-related task, left a lasting impression:

> *"The story of floating stones after writing holy words is so famous, but I never saw it from the lens of climate change. This is actually the first time I am doing this ritual, and the moment I did the ritual and was able to solve the spill. Next time I see an ocean or someone performing this ritual, it will remind me of climate change."*

Our surveys measured corroborated the above, by measuring "IMMERSION" and "ATTENTION." A Friedman test revealed significant differences between the groups for "IMMERSION", $F(9, 210) = 19.78$, $p < 0.002$, with post-hoc Wilcoxon tests confirming Shloka's superior ability to evoke immersion, as detailed in Table 4 in Appendix B. Similarly, a Friedman test indicated significant differences in "ATTENTION", $F(9, 210) = 13.51$, $p < 0.002$, with post-hoc Wilcoxon tests showing that Shloka outperformed other games in eliciting attention as indicated in Table 7 in Appendix B.

*8.2.2 Feeling Heard as a Community:* Shloka created a sense of community by integrating cultural narratives and interactive tasks, making players feel represented and connected. Participants noted how the blend of narrative and gameplay elements not only engaged them but also highlighted complex issues like climate change in a way that felt relevant to their cultural identity.

Participant P14 remarked on how Shloka struck the right balance between narrative and action, emphasizing the cultural aspect as a

key element that fostered a sense of being recognized as part of a community:

*"I think compared to other games, it (Shloka) has the right blend of narrative and things to do. The culture aspect to it makes it more connecting, which almost feels like being seen as a community, in an interactive way. But also at the same time, kind of driving a complex problem like climate change home."*

Participant P11 highlighted a broader perspective, comparing their experience with Shloka to their appreciation for mythological films. They reflected on how such representations can give voice to their community, even if they are not deeply engaged with the cultural themes themselves:

*"Even though I am not deeply into religion, or follow it extensively, it is still part of my identity, and to see my communities stories, and narratives being used for a cause is actually empowering, maybe not from a devotional sense that I need to work towards climate action, but just for the sake of my community I need to think about climate change more actively."*

As part of the GAMEFULQUEST survey, we measured "SOCIAL EXPERIENCE". We aimed to understand if Shloka, provide an avenue to connect with the social aspects (religion, community etc) of the participants. A Friedman's test indicated significant differences between the groups, $F(9, 210) = 30.78$, $p < 0.001$, with post-hoc Wilcoxon tests confirming Shloka's superior ability to evoke social connectedness, as detailed in Appendix B Table 4.

*8.2.3 A Dual sense of achievement:* The stages in Shloka require participants to complete ritual-based tasks, which then enable them to tackle climate change-related challenges. Participants highlighted that successfully completing both types of tasks, and observing the connection between them, gave them a heightened sense of achievement i.e. twice as rewarding compared to other games where the sole focus was on solving climate change challenges. Participant P13 remarked:

*"The whole purpose of going to temples or praying to god, is to wish for good will, and happiness in our lives, in this game, this is evident, like you pray and an outcome happens, apart from the fact i am gaining good deed by chanting I can also learn, as well cause an impact atleast in the game. Other games, I have nothing personal, but here the ritual taps into my personal faith, which makes me feel good."*

Participants further expressed that the ability to successfully execute rituals, combined with systems to verify and validate these rituals, significantly contributed to their sense of achievement. They compared Shloka with other games, such as the AR game H2O and the interactive narrative Illuminate, noting that while these games include tasks to teach the consequences of climate change, they often lack activities that directly involve players in learning or contributing to climate-related solutions within the virtual setting. In contrast, Shloka tasks players with specific, actionable challenges—such as recycling trash or generating renewable energy—immediately following the completion of a ritual. This integration not only reinforces the learning process but also provides a deeper sense of satisfaction. Participant P7 remarked:

*"Like in Illuminate, there are a set of choices I need to choose, and the game goes ahead. In that process I win or loose, but I never felt the 'aha' moment. Here once the Rama was written, and the stones started coming up towards the spill, I felt so good, I know this story, I know what is happening and what is being solved."*

Further, analyzing this from a statistically lens, the GAMEFULQUEST measured "ACCOMPLISHMENT". A Friedman's test indicated a significant differences between the games, $F(9, 210) = 23.89$, $p < 0.002$, and a post-hoc Wilcoxn test indicated that Shloka provides a more sense of Accomplishment compared to other games as indicated in the Table 7 in Appendix B.

*8.2.4 Guidance and Gameplay:* In Shloka, players received guidance from a mentor-god who introduced them to climate change issues, explained the rituals they needed to perform, and clarified how each completed action contributed to environmental well-being. Participants noted that this mentorship style made them feel supported, informed their decision-making, and encouraged attention to key details. Comparing this experience with other games, Participant P10 reflected on the impact of divine guidance:

*"Other games have us doing most of the thinking, which is fine, but I never felt helped. Here, you have multiple gods helping me, pointing out mistakes, showing the consequences, and guiding me to solve them—like Ganesha in all the levels or specific gods in specific levels. I am a Hanuman bhakt (devotee), so hearing from him, even in a game, makes me take his words seriously."*

Participants appreciated how these mentor-gods not only provided practical advice for taking positive climate action but also reinforced core spiritual principles—living in harmony with nature and recognizing a deeper connection to the natural world. Participant P12 described this realization as a wake-up call:

*"I see it as a wake-up call. I know so many people named 'Varun', 'Vayu', and at least half a dozen 'Aditya's—all these names are direct references to climate. When Varun, Aditya appear in the game and tell us how to live, it reminds me of the spiritual connection we have with nature and how we tend to forget it."*

The GAMEFULQUEST survey, measures the attribute of "GUIDANCE" a game provides. A Friedman's test indicated that there exist significant differences between the groups, $F(9, 210) = 27.98$, $p < 0.001$, with post-hoc Wilcoxon tests confirming Shloka's superior ability to guide players into the aspects of climate change and how to navigate the game.

## 9 Discussion and Implications

As depicted in Table 3, our research and its outcomes significantly contribute to three key academic communities: the intersection of religion and videogames, the religion and design community, and the climate change serious games community. Our work offers insights and opportunities for further exploration in each of these domains.

The integration of religious artifacts into videogames has been explored by scholars such as Maram [61, 67, 68, 71], de Wildt [136–139], and Zeiler [140, 141], among others. However, prior research has predominantly focused on analyzing existing videogames to identify religious elements or on establishing and evaluating religious design taxonomies. Our work advances this area in three key ways. First, in Sections 5.3 and 5.2, we present a novel design space

**Table 3: Implications and Contributions to different Academic Communities**

| Community | Previous Work | Our Contributions |
|---|---|---|
| **Religion and Videogames** | Maram [61, 67, 68, 71], de Wildt [136–139], Zeiler [140, 141]: Focus on religious elements and design taxonomies. Lack practical evidence of applying the taxonomy, or have playtests capturing opinions of players. | **Advancing Design Space**: Introduces a novel framework connecting religious practices with climate change, expanding beyond character/narrative design to explore cultural rituals as game mechanics. |
| | | **Rituals as Input Mechanics**: Showcases the use of religious rituals (e.g., chanting, mudras, verses) as core input mechanics in videogames, moving beyond narrative elements to integrate ritualistic actions into gameplay. |
| **Climate Change Serious Games** | Barnes [53], Madani [52], Fjaellingsdal [20]: Focus on climate change communication through games, climate change policies, and specialized stakeholders. | **Localized Climate Change Framing**: Demonstrates how personalized, culturally anchored narratives and religious elements create stronger player connections to climate change as a sacred responsibility. |
| | | **Religion as a Learning & Reflection Mechanic**: Introduces religious elements not just as thematic content but as active learning and reflection mechanics, positioning climate change as a sacred responsibility, enhancing player engagement and personal connection. |
| **Religion and Design Research** | Markum [16], Wolf [17], Gonsher [18]: Designing artifacts to support faith practices, limited to personal faith. | **New Path for Design**: Highlights the potential of using religious contexts in broader educational tools, opening pathways for designing culturally relevant, engaging educational artifacts. Further, highlights how Religion can be used beyond developing religious practice, devotion and prayer tools. |

that connects religious practices with climate change themes, moving beyond previous studies that centered on character or narrative development. Second, We aim to prompt discussions on how religion can transcend its traditional role as a "myth"-creating element to serve as a "learning" mechanic, thereby inspiring artists and religious scholars to create games that explore these dimensions. Finally, in Section 8.2, we move beyond theoretical considerations by offering qualitative and quantitative evidence that demonstrates how religion can enhance reflection, immersion, representational depth, community engagement, and player guidance within serious game environments. Further our themes, such as "Religious rituals and narratives creates an immersive experience", "A dual sense of achievement", "Guidance in Gameplay" highlight various ways religion can contribute to gameplay.

The climate change and serious game community has explored various approaches to communicate the message of climate change [20, 52, 53]. However, few studies have examined the cultural dimensions of both narratives and gameplay mechanics. Participants reflection demonstrate how localized narratives and framing climate change as a personal issue can foster a greater sense of connection for players. Additionally, we explore how incorporating religious elements can position climate change as a sacred responsibility, thus instilling a sense of ownership. Beyond these contributions, Shloka also highlights the limitations of traditional climate change games, which often fail to resonate with individuals' lived experiences [142]. In contrast, Shloka anchors environmental actions within participants' cultural and ritualistic contexts, making them not only more relevant but also actionable. This approach aligns with previous research [143–147], which underscores that personalized and context-specific messaging leads to more meaningful and lasting behavioral change. Further, our themes such as "Feeling heard as a community", "Communicating climate change across generations", "Motivation through granular climate actions" highlight how the presence of religion in climate change games can motivate deeper reflection.

To the design research community, we aim to demonstrate how religion can serve as a rich and effective design space. Our work highlights how collaboration with religious stakeholders and cultural contexts can lead to the creation of meaningful and engaging artifacts. While there has been some research on designing artifacts that support users in practicing their own faith [16–18], few studies have contextualized religion for broader educational purposes. We hope that this work opens a new pathway for both the religious design community and the design research community, encouraging the consideration of lived faith experiences as a crucial element in designing educational tools, communicating important messages and artifacts for diverse age groups.

## 10 Limitations and Future Work

First, although our study shows how religious mechanics can foster familiarity, reflection, and situational interest around climate change, it does not measure players' long-term retention of climate knowledge. Future research should adopt a longitudinal approach to assess whether these insights persist over time.

Second, the definition of "mechanic" in climate change games is broad and often debated. Here, we focused on interaction-based gameplay mechanics rather than conceptual mechanics (e.g., climate policy, resilience, or collaboration). In the future, we plan to deploy Shloka at an institutional level to explore its potential for encouraging collaboration among religious groups and strengthening ties between institutions and followers.

Additionally, although Shloka showed significant effects in multiple areas, improvements are possible. For instance, we found no significant differences regarding in parameters like, COMPETENCE, CHALLENGE, COMPETITION, or AUTONOMY. We will refine Shloka's design to enhance agency and provide greater difficulty, aiming to improve the overall gameplay experience.

Finally, the game currently addresses only the Hindu community. While this is significant—given a population of about 1.2 billion—its relevance to other faith traditions remains unexplored. Likewise, we have not examined Shloka's impact on participants outside the Hindu background. Future studies should broaden the scope to include diverse religious contexts and evaluate its effects across various faiths and also longitudinally within Hinduism.

## 11 Conclusion

In this paper, we discuss the design and development of a climate change serious game titled Shloka. The game draws inspiration from religious narratives and rituals. We playtested Shloka against a corpus of climate change serious games and found that, for the Hindu community, the game resonates more deeply, providing enhanced opportunities for reflection and engagement.

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# A Other Religions and Climate Change

*A.0.1 Islam.* **Islamic Scripture and Climate Change:** The OPEC (Oil and Petroleum Exporting Countries) is a coalition of countries, many of which are major oil exporters with economies heavily reliant on the export of fossil fuels. The Arabian peninsula, both vulnerable to rising sea levels and the largest exporter of petroleum, plays a crucial role in the global battle against climate change. Among the 13 countries in OPEC, eight have a Muslim majority. Despite Islam's significant influence in the governance of these countries, there is a lack of empirical studies on the attitudes of the Islamic population towards climate change, as pointed out by Koehrsen [148].

Muslim environmentalists have sought to interpret the Qur'an and Sunna concerning their relevance to climate change [149, 150]. In particular, they often refer to two concepts, Tawhid and Khalifa, to construct arguments in support of action for climate change.

Khalid [151] elucidates the concept of Tawhid and climate change. Tawhid, in Islamic theology, signifies the oneness of God, acknowledging His absolute singularity, sovereignty, and divinity. Haq [152] and Foltz [153] link the concept of Tawhid with *Mizan*. In Islam,

Mizan represents the divine balance, justice, and equilibrium governing the universe and all creation aspects. The term Mizan translates as "balance" or "scale" in Arabic. Haq [152] interprets this as Mizan emphasizing the duty of humans to act as custodians of the Earth and maintain a balance in the natural world, encompassing sustainable resource use, responsible consumption, and environmental preservation.

Hancock [154] and Bagir [155] contend that the Islamic concept of Khalifa advocates actions towards climate change. The term Khalifa, in Arabic, signifies the role of humans as stewards or vicegerents on Earth. This stewardship implies responsibility and the need for action against climate change. Abdelzaher [149] introduces the Shari'ah perspective towards climate change, employing interpretations of the Islamic concept of Maslahah (public interest). He ties it with the concept of Khalifa, arguing that Islam as a religion promotes forethought for future generations and argues that Muslims should feel obligated to combat climate change for the safety of those generations to come.

**A Paradoxical Take on Islam and Climate Change**: Despite the diverse interpretations of Islamic principles in relation to climate change, these interpretations have encountered significant criticism. Hancock [154] and Gade [156] discuss how the traditional concepts discussed in the previous sections have been cherry-picked and associated with environmentalism. They fear that such selective picking and reinterpretation might not appeal to the broader Islamic audience. Moreover, Saniotis points out how Islam is highly decentralized with multiple groups, teachers, and schools of thought, leaving the interpretation of verses and attitudes towards climate change dispersed, thus making it difficult to call for universal action against climate change [157]. Finally, Bagir and Martiam [155] note that major Islamic nations are currently prioritizing issues such as radical Islam, terrorism, and human rights. Consequently, the discourse around Islamic action against climate change is often relegated to the background.

**Mitigation Efforts of Islamic groups:** Heat stress and droughts across the Muslim-populated regions of North Africa, coupled with devastating floods in Indonesia and Pakistan — both home to the largest Islamic populations — have heightened interest in climate change mitigation policies through Islam [158]. Sovereign Islamic states such as Saudi Arabia and the UAE are creating alternative income sources in technology and tourism sectors [159, 160]. Haron [161] introduces the concept of 'Jihad against Climate Change', wherein Islamic scholars and organizations encourage religious believers to take measures against climate change. In a similar vein, Amir [162] discusses how Islamic scholars, serving traditionally as gatekeepers of information at rural grassroots levels, have dissuaded locals from deforestation and river pollution.

Other climate change mitigation strategies adopted by Islamic communities include the Islamic Declaration on Global Climate Change [160], and institutions like the Islamic Foundation for Ecology and Environmental Sciences that advocate for decisive actions by Muslim states against climate change [159]. Apart from organizations and campaigns to spur action against climate change, initiatives like eco-friendly mosques [163], eco-Haj [164], and eco-Iftars are being pursued to promote sustainable practices, reduce carbon emissions, and minimize waste [165].

*A.0.2 Christianity.* **Christian Scripture and Climate Change:** Hulme [166] referring to the biblical concept 'Kingdom of Heaven on Earth' suggests that religion offers people a lens of ethics and morality, compelling them to consider climate change through moral reasoning. He says the biblical concept emphasizes the importance of stewardship and responsibility towards the planet. Similarly, Hayhoe [167], a renowned climate scientist and evangelical Christian, posits that faith can drive action on climate change. She asserts, "The Bible tells us that God loves all people, and we should too. That means caring for the poor and vulnerable is a Christian responsibility, and climate change is a poverty issue."

Jenkins [168] reflects on Genesis 2:15, which establishes the human role as caretakers: "The Lord God took the man and put him in the Garden of Eden to work it and take care of it." This scripture suggests a divine mandate for humans to nurture and protect the natural world, which implicitly includes addressing climate change. Pope Francis, in his publication Laudato Si, advocates that it is the sacred duty of Christians to act as stewards of climate change and protect the planet. Myers [169] analyzed the impact of Pope Francis's publication and showed that it significantly influenced public opinion towards climate change positively. Other Christian leaders have also supported the interpretation of Genesis 1:28, asserting that humans should prioritize caring for nature and the environment over dominating it [170].

**A Paradoxical Take on Christianity and Climate Change:** In 1967, the Lynn White Hypothesis [171] posited that "Western Christianity is a major cause of worldwide ecological crises." White's hypothesis was built on his interpretation of the biblical belief that man was supposed to rule over the world. His hypothesis sparked intriguing debates on its validity and how varying religious commitments or identities contribute to different levels of environmental destruction and climate change [172].

Smith and Jones conducted several surveys and interviews with American Christian populations [173, 174]. Their survey results revealed that white US Evangelicals are likely to acknowledge the reality of climate change. Barker [175] ties these results to "end times beliefs" prevalent among a significant portion of the white US Evangelicals. They quote the religious population believes in the concept of Doom's Day and climate change. Similarly, Schwadel [176] shows a strong correlation between an individual's "biblical knowledge" and their disbelief towards climate change. However, these claims face vigorous debates in academia. Scholars such as Chaudoin [177] and Ecklund [178] attribute Evangelicals' stance on climate change primarily to their distrust in the ethics and authority of scientific claims and the mistrust of governmental institutions.

Discussing Laudato Si, authored by the Pope, Kahan [179] suggests that the intervention of influential figures in contentious debates can often polarize the issue further. In other words, it could solidify the beliefs of individuals on either side of the argument.

Similarly, Li and Landrum [180, 181] illustrate the repercussions of Pope Francis's pronouncement on climate change in their work. They argue that this statement has caused those with conservative views on climate change to fortify their stance further. The stance that religious leaders take on climate change affects not only believers' reactions but also international policies, as highlighted by Murphy [182]. The religious influence on policies extends beyond

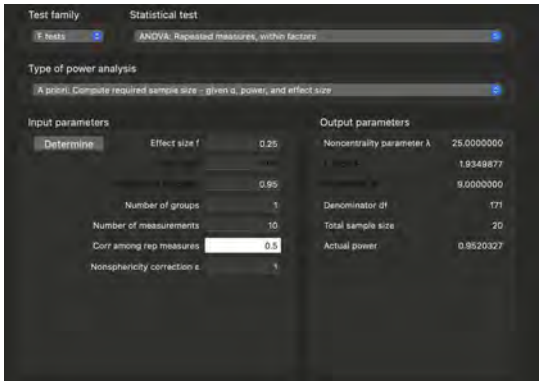


**Figure 12: Screenshot from G*Power highlighting the required Sample Size for the ANOVA.**

religious leaders advocating for climate change. It also includes the significance given to places and animals in religious contexts [183].

**Mitigation Efforts of Christian groups:** Instead of concentrating exclusively on an individual's religious identity and views on climate change, some researchers have shifted their focus to the activities of religious scholars and the engagement of religious politics [184]. One instance of this shift is evident in COP-27 [2], a convention typically reserved for political discussions on effective climate change strategies. The conference hosted a diverse panel of religious elites and leaders, including the Pope, who jointly advocated for the societal implementation of strategies to combat climate change.

Prominent Churches such as the Church of England and the Methodist Church [3] have committed to vocally advocating for the divestment of fossil fuels. Churches in the Pacific Island regions have been encouraging locals to engage in climate advocacy and regularly provide a platform for locals to voice their growing concerns over climate change [185, 186]. Reale highlights in his work [187] that governments in the Pacific island region face budgetary constraints and are often unable to take comprehensive action against climate change. He notes that churches in the region step in to fill these voids and assist in building resilience towards climate change.

*A.0.3 Buddhism.* Javanaud [188] interprets Buddha's Fire Sermon in the context of climate change. She suggests that Buddha's metaphor of suffering through greed, hatred, and delusion can serve as a foundation for a Buddhist perspective on climate change. Buddhist teachings often emphasize renunciation and transcendence of the worldly existence, which leads many scholars to believe that Buddhism is ill-equipped to handle activism [189, 190]. However, Mackenzie [191] critically examines this viewpoint and explains that Buddhists do not interpret renunciation as a complete disconnection from worldly affairs, but as a period of reflection. She mentions that this period of reflection can foster a stronger sense of community and activism.

Referring to Buddhist activists like B.R Ambedkar and Tai Xu, Senuke [192] and Yao [193] discuss the concept of 'Engaged Buddhism.' According to Hanh [194], 'Engaged Buddhism,' in the context of climate change, urges Buddhists to become more aware of their oneness with nature and asserts that protecting it becomes their dharma. This form of Buddhism has been pivotal in responding to deforestation efforts in countries like Sri Lanka and Vietnam [188]. Darlington shares an account of how Buddhist monks in Thailand, Sri Lanka, and Vietnam have introduced ceremonies in which the robes of revered monks are tied around a tree, thereby bestowing a status of respect upon the tree [195].

# B Statistical Calculations

## B.1 Wilcoxn Tests for Various Games

[2] https://www.unep.org/events/conference/faith-based-engagement-cop27
[3] https://www.ft.com/content/56291334-8e98-11e8-b639-7680cedcc421

**Table 4: p-values and effect sizes when comparing Shloka with other games on the parameters of IMMERSION and SOCIAL EXPERIENCE. The column mappings are as follows: G1 = Climate Changer, G2 = Crabby Claws, G3 = Climariqs, G4 = Coral Bleaching, G5 = Mother Nature, G6 = Human, G7 = H20, G8 = Word Wall, G9 = Illuminate.**

| Statement | G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 |
|---|---|---|---|---|---|---|---|---|---|
| IMMERSION | | | | | | | | | |
| When playing the game, I feel transported to another time and place. | P: <0.002, r: 0.80 | P: <0.002, r: 0.87 | P: <0.002, r: 0.85 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.81 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 |
| Exploring the game world feels like taking an actual trip to a new place. | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.83 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.83 |
| When moving through the game world I feel as if I am actually there. | P: <0.002, r: 0.86 | P: <0.002, r: 0.85 | P: <0.002, r: 0.87 | P: <0.002, r: 0.85 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.86 |
| I am impacted emotionally by events in the game. | P: <0.002, r: 0.82 | P: <0.002, r: 0.87 | P: <0.002, r: 0.73 | P: <0.002, r: 0.85 | P: <0.002, r: 0.78 | P: <0.002, r: 0.81 | P: <0.002, r: 0.86 | P: <0.002, r: 0.84 | P: <0.002, r: 0.87 |
| The game was emotionally engaging. | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.85 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 |
| I experience feelings as deeply in the game as I have in real life. | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.83 | P: <0.002, r: 0.78 | P: <0.002, r: 0.84 | P: <0.002, r: 0.83 | P: <0.002, r: 0.83 | P: <0.002, r: 0.86 | P: <0.002, r: 0.82 |
| When playing the game I feel as if I was part of the story. | P: <0.002, r: 0.81 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 |
| When I accomplished something in the game I experienced genuine pride. | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.85 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.83 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 |
| I had reactions to events and characters in the game as if they were real. | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.85 |
| SOCIAL EXPERIENCE | | | | | | | | | |
| Gives me the feeling that I'm not on my own | P: <0.002, r: 0.82 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.82 | P: <0.002, r: 0.86 | P: <0.002, r: 0.83 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 |
| Gives me a sense of social support | P: <0.002, r: 0.87 | P: <0.002, r: 0.85 | P: <0.002, r: 0.85 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.85 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 |
| Makes me feel like I have someone to work with | P: <0.002, r: 0.84 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.84 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.82 | P: <0.002, r: 0.86 | P: <0.002, r: 0.76 |
| Makes me feel like I am socially involved | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 |
| Gives me a feeling of being connected to others | P: <0.002, r: 0.86 | P: <0.002, r: 0.84 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.85 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.83 | P: <0.002, r: 0.86 |
| Feels like a social experience | P: <0.002, r: 0.87 | P: <0.002, r: 0.84 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.80 | P: <0.002, r: 0.86 |
| Gives me a sense of having someone to Share my endeavors with | P: <0.002, r: 0.85 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.83 | P: <0.002, r: 0.86 | P: <0.002, r: 0.85 | P: <0.002, r: 0.73 | P: <0.002, r: 0.87 | P: <0.002, r: 0.84 |
| Influences me through its social aspects | P: <0.002, r: 0.83 | P: <0.002, r: 0.87 | P: <0.002, r: 0.82 | P: <0.002, r: 0.87 | P: <0.002, r: 0.84 | P: <0.002, r: 0.86 | P: <0.002, r: 0.79 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 |
| Gives me a sense of being noticed for what I have achieved | P: <0.002, r: 0.81 | P: <0.002, r: 0.87 | P: <0.002, r: 0.83 | P: <0.002, r: 0.87 | P: <0.002, r: 0.79 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 |

**Table 5: p-values and effect sizes when comparing Shloka with other games on the parameters of NOVELTY, EXPLORATION INTENT and INTRINSIC MOTIVATION. The column mappings are as follows: G1 = Climate Changer, G2 = Crabby Claws, G3 = Climariqs, G4 = Coral Bleaching, G5 = Mother Nature, G6 = Human, G7 = H20, G8 = Word Wall, G9 = Illuminate.**

| Statement | G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 |
|---|---|---|---|---|---|---|---|---|---|
| NOVELTY | | | | | | | | | |
| This activity is new to me. | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 |
| This is a new-fashioned activity for me to do. | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.85 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.78 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 |
| This activity is fresh. | P: <0.002, r: 0.85 | P: <0.002, r: 0.86 | P: <0.002, r: 0.85 | P: <0.002, r: 0.82 | P: <0.002, r: 0.85 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.86 |
| EXPLORATION INTENT | | | | | | | | | |
| I want to discover all the tricks in this activity | P: <0.002, r: 0.81 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.83 | P: <0.002, r: 0.81 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 |
| I like to find out more about how to do it. | P: <0.002, r: 0.83 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.80 |
| I like to inquire into details of how to do it. | P: <0.002, r: 0.87 | P: <0.002, r: 0.85 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.83 | P: <0.002, r: 0.85 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 |
| I want to analyze it to have a grasp on it. | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.85 | P: <0.002, r: 0.87 | P: <0.002, r: 0.83 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 |
| INTRINSIC MOTIVATION | | | | | | | | | |
| I enjoyed doing this activity very much | P: <0.002, r: 0.77 | P: <0.002, r: 0.56 | P: <0.002, r: 0.66 | P: <0.002, r: 0.66 | P: <0.002, r: 0.83 | P: <0.002, r: 0.56 | P: <0.002, r: 0.50 | P: <0.002, r: 0.74 | P: <0.002, r: 0.64 |
| This activity was fun to do. | P: <0.002, r: 0.70 | P: <0.002, r: 0.62 | P: <0.002, r: 0.57 | P: <0.002, r: 0.71 | P: <0.002, r: 0.87 | P: <0.002, r: 0.76 | P: <0.002, r: 0.58 | P: <0.002, r: 0.56 | P: <0.002, r: 0.67 |
| I thought this was not a boring activity. | P: <0.002, r: 0.81 | P: <0.002, r: 0.49 | P: <0.002, r: 0.54 | P: <0.002, r: 0.72 | P: <0.002, r: 0.67 | P: <0.002, r: 0.62 | P: <0.002, r: 0.65 | P: <0.002, r: 0.59 | P: <0.002, r: 0.54 |
| This activity held my attention at all times. | P: <0.002, r: 0.49 | P: <0.002, r: 0.63 | P: <0.002, r: 0.63 | P: <0.002, r: 0.54 | P: <0.002, r: 0.44 | P: <0.002, r: 0.29 | P: <0.002, r: 0.86 | P: <0.002, r: 0.62 | P: <0.002, r: 0.47 |
| I would describe this activity as very interesting. | P: <0.002, r: 0.80 | P: <0.002, r: 0.61 | P: <0.002, r: 0.75 | P: <0.002, r: 0.80 | P: <0.002, r: 0.71 | P: <0.002, r: 0.80 | P: <0.002, r: 0.68 | P: <0.002, r: 0.71 | P: <0.002, r: 0.84 |

**Table 6: p-values and effect sizes when comparing Shloka with other games on the parameters of USEFULNESS, RELATEDNESS. The column mappings are as follows: G1 = Climate Changer, G2 = Crabby Claws, G3 = Climariqs, G4 = Coral Bleaching, G5 = Mother Nature, G6 = Human, G7 = H20, G8 = Word Wall, G9 = Illuminate.**

| Statement | G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 |
|---|---|---|---|---|---|---|---|---|---|
| USEFULNESS | | | | | | | | | |
| I believe this activity could be of some value to me. | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.81 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.86 |
| I think that doing this activity is useful for learning about climate change | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 |
| I think this is important to do because it can help me learn about climate change | P: <0.002, r: 0.84 | P: <0.002, r: 0.87 | P: <0.002, r: 0.85 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.81 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.83 |
| I would be willing to do this again because it has some value to me. | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.85 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 |
| I think doing this activity could help me to understand the impact of climate change | P: <0.002, r: 0.84 | P: <0.002, r: 0.85 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.84 | P: <0.002, r: 0.82 | P: <0.002, r: 0.87 |
| I believe doing this activity could be beneficial to me. | P: <0.002, r: 0.85 | P: <0.002, r: 0.84 | P: <0.002, r: 0.84 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.83 |
| I think this is an important activity. | P: <0.002, r: 0.81 | P: <0.002, r: 0.85 | P: <0.002, r: 0.87 | P: <0.002, r: 0.82 | P: <0.002, r: 0.86 | P: <0.002, r: 0.81 | P: <0.002, r: 0.83 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 |
| I thought this activity was quite enjoyable. | P: <0.002, r: 0.77 | P: <0.002, r: 0.72 | P: <0.002, r: 0.74 | P: <0.002, r: 0.54 | P: <0.002, r: 0.75 | P: <0.002, r: 0.58 | P: <0.002, r: 0.87 | P: <0.002, r: 0.72 | P: <0.002, r: 0.69 |
| While I was doing this activity, I was thinking about how much I enjoyed it. | P: <0.002, r: 0.71 | P: <0.002, r: 0.73 | P: <0.002, r: 0.77 | P: <0.002, r: 0.66 | P: <0.002, r: 0.72 | P: <0.002, r: 0.73 | P: <0.002, r: 0.74 | P: <0.002, r: 0.66 | P: <0.002, r: 0.71 |
| RELATEDNESS | | | | | | | | | |
| I find the relationships in this game fulfilling. | P: <0.002, r: 0.83 | P: <0.002, r: 0.75 | P: <0.002, r: 0.85 | P: <0.002, r: 0.87 | P: <0.002, r: 0.80 | P: <0.002, r: 0.87 | P: <0.002, r: 0.85 | P: <0.002, r: 0.82 | P: <0.002, r: 0.81 |
| I find the relationships in this game important. | P: <0.002, r: 0.84 | P: <0.002, r: 0.87 | P: <0.002, r: 0.83 | P: <0.002, r: 0.87 | P: <0.002, r: 0.85 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.86 | P: <0.002, r: 0.85 |
| I feel close to the characters/NPCs (Modified Question). | P: <0.002, r: 0.83 | P: <0.002, r: 0.87 | P: <0.002, r: 0.72 | P: <0.002, r: 0.87 | P: <0.002, r: 0.82 | P: <0.002, r: 0.84 | P: <0.002, r: 0.82 | P: <0.002, r: 0.81 | P: <0.002, r: 0.87 |

**Table 7: p-values and effect sizes when comparing Shloka with other games on the parameters of ACCOMPLISHMENT, ATTENTION. The column mappings are as follows: G1 = Climate Changer, G2 = Crabby Claws, G3 = Climariqs, G4 = Coral Bleaching, G5 = Mother Nature, G6 = Human, G7 = H20, G8 = Word Wall, G9 = Illuminate.**

| Statement | G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 |
|---|---|---|---|---|---|---|---|---|---|
| ACCOMPLISHMENT | | | | | | | | | |
| Makes me feel that I need to complete things | P: <0.002, r: 0.78 | P: <0.002, r: 0.85 | P: <0.002, r: 0.83 | P: <0.002, r: 0.81 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.84 |
| Pushes me to strive for accomplishments | P: <0.002, r: 0.85 | P: <0.002, r: 0.84 | P: <0.002, r: 0.87 | P: <0.002, r: 0.84 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.84 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 |
| Inspires me to maintain my standards of performance | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.83 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 |
| Makes me feel that success comes through accomplishments | P: <0.002, r: 0.85 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.84 | P: <0.002, r: 0.85 |
| Makes me strive to take myself to the next level | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.85 | P: <0.002, r: 0.84 | P: <0.002, r: 0.86 | P: <0.002, r: 0.86 | P: <0.002, r: 0.84 | P: <0.002, r: 0.83 | P: <0.002, r: 0.83 |
| Motivates me to progress and get better | P: <0.002, r: 0.85 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.85 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.85 | P: <0.002, r: 0.85 | P: <0.002, r: 0.84 |
| Makes me feel like I have clear goals | P: <0.002, r: 0.79 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.80 | P: <0.002, r: 0.87 | P: <0.002, r: 0.85 | P: <0.002, r: 0.87 | P: <0.002, r: 0.76 |
| Gives me the feeling that I need to reach goals | P: <0.002, r: 0.87 | P: <0.002, r: 0.83 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.84 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 |
| ATTENTION | | | | | | | | | |
| I was concentrated. | P: <0.002, r: 0.87 | P: <0.002, r: 0.84 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.79 |
| I was focused. | P: <0.002, r: 0.85 | P: <0.002, r: 0.86 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.85 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.84 |
| I was very attentive all the time. | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.85 | P: <0.002, r: 0.82 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.87 | P: <0.002, r: 0.85 | P: <0.002, r: 0.87 |