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THE SILENT SCREAM OF THE REEF: VISUALISING CORAL BLEACHING IN CHASING CORAL

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ABSTRACT

Chasing Coral, a 2017 documentary film, captures the much-overlooked ecological issue of coral bleaching. The film perfectly encapsulates the devastation of the coral ecosystem that is a reflection of the global climate change which will soon become irreversible if left unattended immediately. This paper aims to tease out the harmful effects of Sargassum Algae and the rising temperature at sea that are directly responsible for the destruction of the coral ecosystems. The theoretical framework of Ecological Film Studies and Environmental Visual Rhetoric is employed to explore the complex scientific records of climate data and to relate it in a comprehensible literary and humanitarian perspective. The powerful environmental call to action will be conveyed through an in-depth analysis of the narration of the documentary that describes the hard work and the findings of the team of scientists and divers who are tracking the phenomenon of bleaching among the coral reefs. The documentary serves as a critical means towards climate crusading and a study of such an environmental film will help bridge the gulf between scientific vision and public awakening, inspiring ecological awareness in the wake of climate crisis.

Keywords: Chasing Coral, Documentary Film, Ecological Issue, Coral Bleaching, Climate Change, Ecological Film Studies, Environmental Visual Rhetoric

1. INTRODUCTION

The "Rainforest of the Sea", as the coral reefs underwater are often referred to, abound in their ecological significance and incredible diversity Swart (2013). These reefs provide habitat for multitude of marine life and form an indispensable part of the ecosystem. Unfortunately, as a result of climate change, the value of coral reefs is reduced due to the laundering of corals. Coral bleaching is a phenomenon that occurs when sea temperature increases, which negatively affects symbiotes of algae corals, known as Zooxanthellae. Thermal stress over a long period leads to what is known as a situation in which corals secrete their zooxanthellae, a condition in which they exhaust all their energy and become ill

Hughes et al. (2017). Bleached corals lose their algae and, to some extent, other symbiotic relationships.

Human activity, especially in combination with temperature changes, has significantly worsened coral bleaching. Ocean acidification also plays a critical role, reducing the pH of water as excess Carbon-di-oxide from the atmosphere is absorbed by the seawater. This change leads to the formation and maintenance of the calcium carbonate backbone. According to Kleypas & Yates (2009), even small changes in pH can significantly prevent coral calcification. Furthermore, contamination of agricultural streams, wastewater and industrial waste that are dumped into the ocean also contribute to creating nutrients and chemicals that stimulate the growth of algae that compete with corals for key resources. They disrupt the reef ecosystem, allowing algae to thrive uncontrollably, choking coral colonies and preventing recovery Jackson et al. (2014). Increase in tourism in the coastal regions also contributes to the detrimental effects, such as increased sedimentation, altered water flows, and physical damage to coral reef structures, thus resulting in environmental degradation Wilkinson (1996).

Coral reefs are one of the most diversified and most important ecosystems of our planet, providing basic services, such as the protection of coastal areas and the promotion of the rich biodiversity under water. Unfortunately, they are currently under a serious threat due to the rapid impact of climate change UN Environment. (2021). General reports of coral decline have emerged worldwide, with some areas experiencing unexpectedly high mortality rates, owing to global warming. Prolonged periods of high temperatures have led to a significant decline in coral populations, especially in reef ecosystems, and this is a major challenge observed in recent decades. Furthermore, ocean acidification threatens coral reef formation and reduces the stability of these ecosystems to environmental stressors, creating long-term risks for the environment.

Other than the factors of warming and acidification, hurricanes and typhoons constitute extreme weather conditions that resonate danger to coral reefs. As these storms become more intense and frequent due to climate change, they further physically damage already stressed coral structures. Researches indicate that storm surges and wave action can break apart reefs, displace coral colonies and enhance sedimentation, further impeding their recovery process Hoegh-Guldberg et al. (2007). This accelerating destruction makes many reefs constantly degrade and reduce in their potential of delivering vital ecosystem services.

The link between coral reef degradation and climate change underscores the urgent need for conservation efforts and the adoption of effective environmental policies. The preservation of the marine environment, the adoption of sustainable fishing methods, and the restoration of coral reefs are crucial for ensuring the survival of these endangered ecosystems. That being said, it addresses the biggest contributor to global warming - greenhouse gas emissions – which is the greatest threat at the moment. Without drastic carbon emission cuts by the global community, the future of coral reefs and the tens of millions of species and communities that are dependent on them hangs in the balance IPCC. (2019). Chasing Coral is a powerful presentation that talks about the rapid decline of coral reefs through dramatic visual narratives to establish a crisis emergency. A massive incident occurs while scientists and divers witness the importance of marine ecosystems and the dire impacts of climate change on underwater life. As the documentary states, “What hope do we have for other planets if we cannot save the reefs?” Chasing Coral (2017). The documentary teaches audiences and acts as a

catalyst for climate activism, galvanizing people to recognize their role in slowing environmental destruction.

This paper analyses how Chasing Coral uniquely examines the web of interactions between coral bleaching and climate change that extends far beyond reef ecosystems involving biodiversity, economies, and coastal communities. Therefore, this research sees the necessity for action by highlighting coral bleaching scientifically, climate change through the political spectrum, and the documentary's role in raising awareness. According to Chasing Coral, the fate of coral reefs intrinsically links with greater environmental issues in dire need of immediate and concerted action to conserve them.

2. CHASING CORAL: VISUALIZING CLIMATE CRISIS AND CONSERVATION

Using sophisticated time-lapse technology, the filmmakers of Chasing Coral capture the stunning changes of coral reefs with the passage of time. The film exposes the disturbing reality that rising ocean acidification and sea temperatures due to climate change are wrecking these habitats, which support about a quarter of all marine species. The crew conveys the great need for coral preservation and the urgency of conservation projects via personal narratives and moving scientific insights. Their effort to record these ephemeral moments not only raise awareness but also emphasize the interdependence of all life on Earth (Chasing Coral).

By providing a compelling narrative, Chasing Coral is both a visually stunning film and a compelling call to action, driven by its engaging narrative. Loss of species, disturbance of sea ecosystems, and adverse consequences of coastal living are among the many ways the collapse of coral reefs affects the environment as portrayed in the film. Through the documentary, the filmmakers motivate viewers to protest for governments that are sustainable, call for carbon emission reductions, and support projects in ocean preservation. Looking back at their experience, their sense of urgency remains, and viewers are left informed and motivated to join the cause of coral reef conservation (Chasing Coral).

Environmental stress makes corals expel the algae residing inside their tissues, therefore turning them white and raising their energy loss. This phenomenon is referred to as "coral bleaching". This makes the corals exposed and they soon die, leading to the death of other parasitic lives on these reefs. Bleaching is mostly triggered by global warming in the form of rising sea surface temperature. Records from the National Oceanic and Atmospheric Administration (NOAA) in 2024 show that even small 1-2 degrees Celsius over typical summer peak levels can trigger extensive bleaching that seriously affects fishing industry and maritime variety. NOAA. (2024). Coral reefs play an imperative role in ensuring ocean health opine experts and marine scientists. In the words of Dr Sylvia Earle, "Coral reefs are the rainforests of the sea. They support a tremendous amount of life and are essential for the health of our oceans (2009). Deep-sea pollution and overfishing are the prime reasons for the coral reef destruction and the same can be avoided by taking proper steps in the direction. Research in 'Nature' demonstrates the recovery of coral reefs from bleaching and experts suggest various conservation initiatives in this direction (2017).

Ever-increasing temperatures and ocean acidification pose serious threat to coral reefs. The pH level of the seawater is also drastically decreasing due to high rate of Carbon-di-oxide absorption in the seawater when these coral reefs are affected. This decrease in pH defines the acidification of the waters that disrupts

the development of calcium carbonate skeletons. The structural decaying of reefs accordingly weakens them, enhancing their susceptibility to hurricanes and current-driven destruction. Research conducted by Baker, A. C., et al. (2008)indicates that lower calcification rates negatively impact reef resilience, thereby exacerbating the effects of environmental stressors Baker et al.,2008.

Pollution is also among the main causes of reef decline. Agricultural runoff, plastic debris, and untreated sewage dumping pour hazardous chemicals into the ocean that feed algal blooms that compete with corals for light and space. Research by Fabricius (2011) shows that poor land use planning and coastal development influence reef health, which demands some level of urgency in land-use policy reform to counteract these effects. Multidisciplinary interventions will be needed to boost responses to several threats caused across the world to coral reefs. That is, the rehabilitation of marine protected areas, sustainable fisheries and marine resource management, and actions on climate change are pertinent. Conservation efforts must be spearheaded by communities themselves, and teachers must join in on the sensitization of the public about the importance of coral reefs. Breakthroughs in coral research towards selective breeding of thermally resistant coral species provide added promise for reef rehabilitation and conservation. Cooperation on an international scheme and localized initiatives should play an important role in building the resilience of coral ecosystems to withstand environmental challenges.

According to the data from The Hindu, nearly two-thirds of the coral reefs around the globe are under threat from deforestation, climate change, and increases in ocean temperature as a result of the phenomenon El Niño. Recent estimates from NOAA show that well over 60% of the world's waters are polluted, further threatening marine ecosystems. We are very worried about the condition of the coral reefs around the world, especially in areas like Lakshadweep, explained Derek Mangelo, an officer dealing with NOAA's coral reef (The Hindu 17 May, 2024). Chasing Coral tells a story that, with great realism, shows how urgent the conservation of coral reefs is and the dire ecological and socio-economic implications the die-offs present. By creating awareness to act, the documentary adds to a larger conversation on climate change and ocean conservation. This film is as much a reminder as a wake-up call, for without immediate intervention, marine ecosystems and all the life that they support face an uncertain future.

3. NARRATIVES OF THE DEEP: INTERSECTION OF SCIENCE, LITERATURE, AND CORAL CONSERVATION

Many studies were held around well-known environmental threats like increasing sea temperature and ocean acidification; however, another category - easily misjudged - that can change coral reefs is that of nutrient pollution and sedimentation. Faecal and agricultural run-off put far too many nutrients into coastal waters that have profoundly nourished an algal bloom, each of which competes for space and overgrows corals. Coastal development and bad agricultural practices additionally add to sedimentation, which reduces the extent of penetration of light into water, and this condition prohibits the occurrence of photosynthesis, adversely impacting the health of corals. Very few, indeed, have garnered so loud and continued an audience. This documentary is an effort to raise the public consciousness and awareness of marine life conservation through an open and engaging discourse. Public perception and insistence on coral conservation is imperative and calls for graver discussions on the environmental concern of impending ecological crisis as an outcome of damage caused to the

coral reefs. Films like Chasing Coral exercise a significant bearing upon the minds of the viewers through their compelling narration and visual impact. Engaging in such academic deliberations that spring from a discussion of such documentary films encourages deeper reflection and contemplation on the decisive question of the moral accountability of humankind towards our aquatic ecosystem.

A collaborative effort, with emphasis on education as well as comprehensive outreach are essential to bridge this gap. The understanding that individual behaviours impact global environmental issues can reach the masses through workshops, school science projects, citizen community science exhibitions, and the like. Thus, ecological destruction and its expression through imagery in literature can bridge the gap and make the common citizens aware of the global ecological destruction that is resultant of coral bleaching. Literature in these settings provides ample food for thought and incites creative writing, narratives, or comparative inquiries to drive appreciation for these delicate ecosystems as advocacy types. From establishing conversations not purely scientific but driven into the Humanities discourses can unfurl a more comprehensive understanding of coral reef conservation, launching its value not merely through its ecological definition but rather accentuated through symbolic, aesthetic-an-eye for representation in human consciousness.

4. METHODOLOGY

This study employs qualitative methodology to conduct thematic analysis of the documentary Chasing Coral with the extraction of secondary material from scientific literature, environmental reports, and public opinion surveys. The study aims to investigate how the documentary positions people to take action against bleaching of corals and climate change while looking at visual rhetoric, emotional engagement, and the narrative style of the film. The study explores the storytelling strategies used in the documentary to create both an emotional as well as an intellectual connection between the audience and the pressing environmental issues presented. The exploration is primarily a content analysis that systematically categorises principal themes and messages aimed through the documentary. This study aims at communicating how the film conveys the imminent requirement of protecting the environment, particularly the marine ecosystem, by avoiding coral degradation, thus inspiring the viewers to care for the environment. The compelling visuals of the bleached corals educate the viewers and are a powerful persuasion technique to call for action – the immediate need for environmental protection. Thus, the impending urgency of marine life conservation and environmental protection are reinforced through an influential intersection of visual and oral narratives Orlowski (2017).

Through the lens of Discourse analysis, one can understand how language and rhetoric contribute heavily towards conveying the film's message. Reports and recommendations by scientists, local activists as well as resident communities provide the testimony as participants in the environmental crisis. They voice public opinion regarding climate change and represent the collective social and ideological discourse. Through a thorough analysis of the portrayal of these stakeholders, this document exposes the powerplay in environmental narratives. Thus, with an adept amalgamation of scientific knowledge and personal opinions, it influences the perceptions of the audience Hughes et al. (2017).

The documentary film underpins the socio-ecological prototype through an exploration of the intersection of human behaviour, environmental consequences and social accountability. This documentary emphasizes that the phenomenon of

coral bleaching is one component of a vast ecological crisis; therefore, an obvious pursuit of systemic changes regarding sustainability practices are paramount. The necessity for individual and collective action, from activism to lobbying to lifestyle changes, is reiterated to adequately respond to climate change and protect marine ecosystems NOAA. (2024).

The narrative technique of the documentary Chasing Coral exemplifies significant statements that formulate documentary film theory, through emotional storytelling, the filmmakers build a certain narrative arc that immerses viewers in both the beauty and the tragedy of coral reef ecosystems. The contrast established between the lively, healthy reefs and the chilling, distraught depictions of bleached corals add a compelling sense of urgency in the film, making the degradation of the environment emotionally relatable. It informs but also asks the audience to get up and act as they raise their voices against climate change Earle (2018).

The documentary also engages with sustainable development theories by stressing the delicate equilibrium between the preservation of the environment and economic growth. Highlighting the implications of unsustainability, Chasing Coral argues that certain practices favour economic stability as well as ecological preservation. The film charters the catastrophic effects of climate change on marine life in line with the ethical argument that the current generation is responsible for protecting natural resources for the future generations. And indeed, moves us from policy-making and consumer practices toward oceanic ecosystem damage control Marine Conservation Society. (2021).

In addition, the documentary illustrates climate change theory by presenting scientific evidence regarding rising ocean temperatures and their impact on coral reefs. Chasing Coral brings life to the arcane issue of climate change in such an attractive manner that the crisis does not seem too remote to connect with the audience. The visually arresting images of the film emphasize coral bleaching, further reinforcing the call for urgency in climate action. The intimate connection between the decline of the reefs and general ocean climatic trends brought to light in this documentary extends the ripples of change by emphasizing the interrelatedness of environmental changes and their subsequent effects. Baker et al. (2021)

Chasing Coral can also be analysed from the perspective of Ecofeminism, which investigates the correlations between exploitation of environment and marginalized voices. Coral degradation is shown in this documentary and showcases the immediate communities affected, mostly communities that rely on marine ecosystems as a means of survival. The film highlights Indigenous knowledge and local conservation efforts to undermine traditional Western-centric narratives in conservation and let the importance of inclusive community-cantered approaches shine. Ecofeminist theory widens the discussion on coral conservation advocating for a variety of perspectives and intersectional approaches in ecological preservation Fabricius (2011).

5. "EXPLORING THE AIMS AND OBJECTIVES OF CHASING CORAL: RAISING AWARENESS AND INSPIRING ACTION"

This paper explores how coral bleaching and climate change are depicted in the documentary film Chasing Coral. The documentary raises awareness of the urgency of the issue while inspiring action. One of its key objectives is to examine how coral bleaching is depicted in the film, how its causes and the process are illustrated, and the extent to which a general understanding of these factors is

necessary to fully grasp its consequences for marine ecosystems. The study goes on to include an examination of the environmental, economic, and social ramifications of coral bleaching as defined in the documentary, ranging from biodiversity loss through fishing community problems to the threats encountered by coastal protection Orlowski (2017).

Another important aspect is how documentaries are calling out to the individuals and communities to take active participation in the conservation agendas and adapt sustainable practices for conservation of coral reefs. Additionally, the analysis situates coral bleaching within the broader context of climate change, as explored in Chasing Coral. This will compel the audience to think about where they fit in this marginalization of the environment and how they can undo the harm. The documentary further shows that human actions, such as pollution, overfishing, and greenhouse gas emissions, contribute to coral bleaching and pose a threat to marine ecosystems Hughes et al. (2017). This study critiques the narrative techniques of the documentary in evoking individual and collective actions, instilling a sense of responsibility in the audience. This documentary enhances environmental advocacy by engaging the audience through a distinct emotional appeal that is a result of intertwining visual storytelling and personal testimony. There are various studies that emphasise sustainable environmental protection practices like authoritative ocean tourism, sustainable methods of fishing and eco-land-use policies that impress the concept that human involvement can help reduce the damage done to coral reefs Earle (2009).

This documentary film gives a clear view of how significant the coral reefs are in supporting marine ecology by enhancing carbon absorption, supporting biodiversity and enabling local economies. Thus, by connecting marine ecosystems with other environmental issues, this film sounds the clarion call advocating environmental awareness. It also underscores the need for planning better climate policies, accentuating the impact of legislation in protecting marine habitats and fostering lasting impact in mitigating climate change NOAA. (2024).

Chasing Coral stresses the need for global unity in our efforts to conserve the coral reefs, emphasising how this issue of environmental concern goes beyond the national boundaries. It inspires a shared obligation towards our environment as it shows international maritime research initiatives, conservation efforts led by local communities and environmental activities at the grassroot level. The movie has an educational value and needs to be screened in schools and centres of learning. It calls for a collaborative strategy in underwater life protection, endorsing local as well as global exertion to take steps towards climate resilience and augmenting coral reef conservation Marine Conservation Society. (2021). This film is not merely a documentary to be watched carelessly, but an extremely thought-provoking film that combines scientific knowledge, personal storytelling and live visual narration, thus inspiring “an urgent appeal for action.” Baker et al. (2008). By inspiring viewers to recognize their role in environmental stewardship, the film contributes to the ongoing discourse on climate change and marine conservation, reinforcing the necessity of immediate and sustained efforts to preserve the planet’s fragile coral ecosystems Fabricius (2011).

6. "KEY FINDINGS AND IMPACT OF CHASING CORAL: UNDERSTANDING, EMOTIONAL ENGAGEMENT, AND CALL FOR ACTION"

The documentary Chasing Coral provides rich information regarding the phenomenon of coral bleaching and its far-reaching consequences for the maritime ecosystem. According to it, when a coral expels the algae from itself, thereby losing the bright colours and the necessary nutrients, the result is a climate-induced dramatic temperature rise within oceans that causes bleaching. Hoegh-Guldberg et al. (2007). This intricate relationship of the algae with the reef cores has provided the sustenance positively needed for reefs and yet, at the same time, remains monopolized by the hazardous impacts brought on by global warming. Moreover, the ecosystem of coral reefs is a gold mine of biological resources in this seemingly contradictory world. It is held that this complex association, that of corals and algae, has been very important for reef survival but is also very susceptible to the deleterious influences of climate change, e.g., correlating temperature and ocean levels. A central theme of the film is the role of climate change and in particular, global warming, in the exacerbation of ocean temperature rise, which then leads to extensive coral bleaching. The death of reefs not only has an effect on coral species but also causes a disturbance in the marine ecosystem, more vital than the survival of billions of marine organisms that have coral reefs as their natural habitat Hughes et al. (2017). The documentary goes on to highlight the wider biodiversity losses caused by coral decline, thus attesting the fact that coral reefs are key ecosystems in the ocean that are home to marine life Knowlton (2012).

Chasing Coral, the documentary, utilizes the time-lapse cameras of the latest technology which is one of its greatest contributions through a systematic intersection of science, technology, environmental concern and human efforts. The environmental concern is visualised effectively by the use of time-lapse cameras and other modern technological developments that help in the generation of scientific reports and results needed for the film. Thus, these tools are the main means for displaying the process of reef degradation in a very effective and vivid manner. Moreover, the visuals make the crisis real for people around the world Orlowski (2017). The scientific commentary as well as the gripping dramatization and narration of the decline of these reefs' ecosystem is effectively captured by Chasing Coral. In sequence, testimonies of the scientists and activists are given, as a result of which a deep emotional narrative is revealed. The scientists, together with the activists, managed to gather the huge number of images with a focus on the details. Yes, they deserve such an acknowledgment and attention Earle (2009). Ultimately, Chasing Coral is not only an educational tool but also a clarion call for immediate action. Its message is an urgent need for the involvement of the entire world in the fight against climate change and the earnest efforts for saving the sea plants and animals. It is a loud reminder that, although there is a crisis for coral reefs, it is not total darkness, because hope still prevails and it is within the reach of individuals and communities if they decide to act with decisiveness and seriousness. The documentary captivates its viewers with the strength of its visuals and the truth of its story, the indirect audience through the powerful result of the ocean's ecosystem, and makes them feel strong enough to be a part of environmental activities Marine Conservation Society. (2021).

7. CONCLUSION

The necessity to fight the global problem of climate change is underscored in this documentary film. The documentary serves as a valuable didactic material as it talks about the fast pace of the global corrosion of coral reefs. Through a powerful visualisation of the consequences of the enormous damage that is inflicted onto coral reefs, the documentary serves as an eye-opener. Thus, the coral reefs have been under threat of extinction dated back to the 1970s, with 50% of the world's coral reefs disappearing due to structured policies ignoring the problem, and the subsequent rising of the seawater temperature, pollution, and overfishing. The documentary suggests that people's activity causes good or bad outcomes, and it is better to show the most ecologically precarious regions visually, in the form of bleached coral reefs, so as to instil a sense of urgency among the viewers. The documentary displays the enormity of the problems with the environment and the economy by showing the coral reefs that are fast approaching death. Thus, coral reefs, which are highly sensitive to environmental changes, among the aforementioned activities, are the harbingers of benefits to many people, where they serve as food sources, are an attraction for tourism, and are protecting the coasts. The documentary is a blend of facts and feelings in an attempt to seek responses from the public; it also calls for the safeguarding of invaluable ecosystems for future generations. Films such as Chasing Coral adequately depict the issues around climate change and the inspiration needed to create a change. Through fostering consciousness towards nature and preserving the environment, the film acts as an education material and serves as an example of activism aiming to aid in saving the environment. The restoration of coral reefs is a project that is valid today, and trying to restore some reef areas from further damage. Everyone from government officials and businessmen to the local citizens must accept these initiatives and put forth their earnest efforts into taking a leap in the right ecological direction. It is also important to remember that saving animal species of a given region is not enough; one must always think of the general global environment and the future of the entire planet.

Through its narrative, the film communicates an essential call for action and international collaboration to address climate change while safeguarding oceanic environments. The film prompts audiences to examine their environmental responsibilities and engage in effective sustainability practices. The necessity for proactive interventions to protect coral reefs reaches an unprecedented level because these actions directly support marine life. It is imperative that we unite in our efforts to protect and restore coral reef ecosystems, ensuring their survival for future generations.

CONFLICT OF INTERESTS

None.

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