

Creation and International Communication of Natural Ecological Documentaries from The Perspective of Environmental Communication

Haichao Jiang¹, Sastra Laoakka², Thitisak Wechakama³

¹Faculty of Fine Applied Arts and Cultural Science, Mahasarakham University, Thailand

²Faculty of Fine Applied Arts and Cultural Science, Mahasarakham University, Thailand

³Faculty of Fine Applied Arts and Cultural Science, Mahasarakham University, Thailand

Correspondence: Sastra Laoakka, Faculty of Fine Applied Arts and Cultural Science, Mahasarakham University, Thailand, hugna.studio@gmail.com

Abstract

This study aims to explore the conservation and international communication capabilities of documentary filmmaking through the medium of natural ecology. Under the pressures of globalization and modernization, environmental challenges facing humanity, such as global warming and air pollution, are becoming increasingly prominent. This study evaluates how natural ecology-oriented documentaries can simultaneously serve as conservation tools and international communication tools to promote the dissemination of ecological knowledge and concepts, and enhance the dissemination of ecological culture and the transmission of ecological values. Through the production of natural ecology documentaries and the public discussion they spark on environmental issues, natural ecology documentaries can reduce cultural barriers in cross-cultural communication and promote international exchange and dissemination of ecological civilization. This study employs a mixed-method approach combining literature review, field research, and interviews with practitioners, environmentalists, and cultural experts. Using environmental communication theory as a framework, and focusing on natural ecological documentaries, it analyzes the construction of environmental discourse and its social functions in these documentaries. By comparing the discursive characteristics of the documentaries "An Inconvenient Truth" and "Under the Dome," this study explores the discursive differences between Chinese and American natural ecological documentaries. The findings suggest that while traditional communication methods remain crucial, integrating modern media with natural ecology can enhance audience engagement and contribute to environmental protection. The documentary format enriches narrative frameworks and contextual interpretations, effectively raising awareness and promoting cross-cultural exchange and international dissemination of ecological civilization.

Keywords: Natural and ecological documentaries, environmental communication, media in International Communication, ecological awareness

1. INTRODUCTION

While the rapid development of modern industrial civilization and science and technology has created immense material wealth for human society, it has also brought with it uncontrollable risks and disasters. As the environment upon which humanity depends for survival increasingly deteriorates, terms with catastrophic connotations such as "environmental crisis" and "climate crisis" have been widely used to describe the current deteriorating environmental situation. Among the many forms of risk that exist in human society, environmental risk is undoubtedly a typical and fundamental one. When it comes to research and discussion of risk issues, environmental risk occupies a significant proportion. It is precisely

within the macro-modern context of risk society that the issue of "environment" has been elevated to a prominent position in communication and sociological research.

In recent years, with the government's policies and regulations regarding the construction of an ecologically civilized society, public environmental awareness has increased. More and more people are realizing the severity of current environmental problems and ecological conditions. Consequently, calls for improved education and publicity on environmental concepts and ecological awareness are growing louder.

Documentary is a key form of mass media. With its non-fictional subject matter, diverse creative techniques, and integrated audiovisual elements, it has become a crucial means of recreating the natural environment and disseminating ecological concepts. In recent years, an increasing number of social practitioners and artists have sought to realistically document the state of natural ecology and human society through documentaries, exploring the relationship between humanity and nature, reflecting on the meaning of human existence, and hoping to identify future development paths that ensure the survival of humanity and other species on Earth.

Ecological documentaries not only reflect a keen interest in the natural environment, including the ecological, natural, and atmospheric conditions that underlie survival, but also focus on exploring the damage caused by human intervention in nature and the measures that can be taken to save nature and, in turn, humanity itself. While realistically documenting society, these films are also imbued with the subjective emotions of the creators.

This study examines documentary filmmaking as both a tool for ecological conservation and a medium for communication. This approach aims to capture the current state of environmental communication about nature and ecology, the ways in which environmental content is produced and agenda-setting in mass media, and the production and construction of documentary films about nature and ecology. It also structures content to appeal to diverse audiences, particularly younger viewers. Through the integration of media innovation and visual symbolism, this study proposes a practical path to maintain the vitality of environmental forms, enhance public awareness, and ensure their survival and relevance for future generations.

1.1 Research on Environmental Communication

The study of environmental communication originated in Western academia, particularly in Europe and the United States, and is still an imported product in my country. Environmental communication entered the Chinese academic landscape in the 1970s, and over the past four decades, the field has made significant progress. Current research on environmental communication, both domestically and internationally, focuses on the conceptualization and development of environmental communication, its functions in news media and Weibo, and its agenda-setting and discourse analysis.

The concept of "environmental communication" was first proposed by German sociologist Niklas Luhmann in 1989. He defined environmental communication as "any communication practice or method related to environmental issues that aims to change social communication structures and discourse systems." He viewed human society as a complex system constructed by the combination of symbols and communication behaviors. Within this system, Liu (2011) discusses environmental issues and environmental awareness must be incorporated into communication to produce specific social effects. Luhmann viewed environmental crises as a crucial link in the connection and fission between society and nature, arguing that the core of environmental communication research lies in exploring the symbolic interpretation and discursive construction at the intersection of environmental security and social change. Early research on environmental communication involved sociology and was linked to environmental politics. However, in 1991, Myerson and Reading identified six key actors involved in environmental communication: citizens and communities, environmental organizations, experts and scholars, commercial companies and public relations, anti-environmentalists, and the mass media.

Environmental communication means that while communicating about nature, it also constructs human understanding of nature. Therefore, in Cox (2016) view, environmental communication is a metaphorical and symbolic practice that creates reference points for our attention and understanding of the environment, nature, and human beings by depicting nature and the environment through a specific perspective and using language and other symbolic symbols. However, whether from a pragmatic or constructivist perspective, environmental communication is always inseparable from the communication practice of mass media.

1.2 Research on Natural Ecological Documentaries

Internationally accepted natural and ecological documentaries fall roughly into two categories. One is "pure" nature documentaries, which primarily focus solely on animals, plants, and other non-human creatures. By examining the natural environment, ecological landscapes, and the natural habitats, behaviors, and daily habits of various species, these documentaries aim to illuminate the current state of non-human life in nature, possessing both strong cognitive, scientific, and aesthetic value. The other is ecological documentaries, also known as environmental documentaries. These documentaries are closely related to human behavior, depicting the state or changes of animals, plants, and other phenomena under the influence of human behavior. They reflect the profound impact of human behavior on the natural ecosystem and offer a realistic depiction of the relationship between humans and the natural environment. Since the evolution of human civilization, from primitive civilization to agricultural civilization to industrial civilization and today's information civilization, has often come at the expense of the environment, ecological documentaries, through investigation and filming, highlight the destructive effects of human behavior on the ecological environment, thereby sparking public awareness and reflection on natural ecological issues. Ecological documentaries offer audiences a visual and auditory feast, while also addressing issues such as humanistic care and the relationship between humans and nature. These documentaries possess unique artistic and aesthetic characteristics, providing entertainment while also enhancing our understanding of the natural environment.

1.3 Research on the Communication Function of Natural Ecology

In recent years, a growing body of literature has emphasized the role of media, particularly documentaries, in the protection and international dissemination of natural ecology. For example, Bao and Zhang (2022) highlight the global dissemination potential of documentaries in enhancing the impact of China's ecological environment. Their research emphasizes the need for media-led solutions to protecting the natural environment in the context of globalization. This perspective aligns with the goal of this study, which is to use documentary production as a means to document and disseminate audience understanding of life, thereby promoting broader cultural dialogue.

After reviewing the development of natural ecology documentaries in my country, Guo(2013) proposed that documentaries are a medium for constructing social issues, particularly those related to humanities and social sciences, where their social impact plays a significant role. Jin (2011) through his analysis and reflection on documentaries on natural ecology in China, found that these documentaries play a significant role in promoting ecological aesthetics. By broadly disseminating ecological ideas, documentaries can also promote ecological aesthetics in everyday life, enabling more and more people to truly and deeply appreciate the importance of ecological harmony for humanity and future generations.

1.4 The Development of Natural Ecology Documentaries at Home and Abroad

In the 1950s and 1960s, faced with a series of ecological crises, a massive green movement arose in the West. From national leaders to grassroots environmental groups, everyone was actively involved. This trend spawned the emergence of new disciplines within the social sciences, providing theoretical guidance and a scientific foundation. For example, the emergence of environmental philosophy in philosophy and ecological aesthetics in aesthetics provided a wealth of literary resources for the public. Griffin (2016) with the rapid development of mass media and the widespread popularity of film and television, films and

documentaries on nature and ecology also emerged in the film and television industry. Globally, the most widely and well-known nature and ecology documentaries are those produced by the BBC in the UK, Hollywood in the US, and French documentary films. The BBC is recognized worldwide as a pioneer in ecological documentary. As early as 1955, it began producing and broadcasting the insect documentary "View." The quality of BBC ecological documentaries has consistently been among the highest in the world. The BBC has even established a dedicated natural history department to produce documentaries on this subject. These documentaries, broadly categorized into three main categories: Earth, the Universe, and Natural Life, are captivating to viewers through exquisite image quality, both macroscopically and microscopically. Since the 1990s, French documentary director Jacques Perrin's "Heaven, Earth, and Man" trilogy has sparked a wave of ecological documentary filmmaking, prompting producers and investors to invest more time, money, and technology in the production and creation of these documentaries.

Entering the 21st century, with Hollywood's Academy Award-winning nature-related documentaries like "March of the Penguins," "An Inconvenient Truth," and "The Cove," the production and creation of nature-related documentaries have been propelled to the forefront of visual communication. As one of the most developed countries in the world in terms of film and television industries, the United States boasts a relatively mature development of nature-related documentaries. Whether it's traditional Hollywood studios, the Discovery Channel, or National Geographic Channel, Disney's Nature Channel, established in 2008, or emerging streaming platforms like Netflix, all are focusing on the planet we depend on for survival. Brulle (2010) with the increasing attention paid to these platforms, significant investment has been poured into this documentary field. In addition to professional filmmakers, an increasing number of scientists, environmentalists, and environmental organizations have also joined the creation of nature-related documentaries. This collaborative effort has propelled nature-related documentaries to the forefront of visual communication, attracting a large audience.

Human Intervention in American Environmental Documentaries. Unlike British and French documentaries, which minimize human involvement, American nature-based documentaries exhibit a distinct tinge of ecological extremism and ecological rationalism. Besides depicting the true state of the natural ecosystem, American documentaries also favor the use of specific environmental crises as subjects, interweaving human behavior into their narratives. Specifically, American nature-based documentaries often feature public figures as narrators, focusing on topics such as climate change, green consumption, and the recent advocacy of vegetarianism by elites. These documentaries are supplemented with the voices of professionals from various sectors of society and scientific data. These documentaries attempt to leverage the influence of public figures to urge audiences to pay attention to and take action on the ecological and environmental issues brought about by global warming, demonstrating the powerful voice of the elite and their concern for the planet. For example, Hollywood star Leonardo DiCaprio co-produced films like "The 11th Hour" and "Before the Flood," which caused a huge sensation worldwide. Leveraging DiCaprio's global popularity, they sparked a surge in public awareness of environmental protection and further permeated the social consciousness of ecological civilization through film. Documentary filmmakers attempt to present themselves as "speakers for all humanity," calling on the world to take action and make changes within their capacity to protect the planet. However, this approach still views the issue from the perspective of vested interests, neglecting the realities of developing countries and impoverished regions around the world and thus possessing certain limitations.

1.5 Comparison of the Characteristics of Natural Ecology Documentaries in China and the United States

In 2006, the documentary "An Inconvenient Truth," narrated by former US Vice President Al Gore, was released and won an Academy Award the following year. In the documentary, Gore cast aside his political identity and presented himself as an environmentalist. He discussed climate change by citing existing scientific evidence of global warming and incorporating his own experiences and emotional appeals. In 2015, the documentary "Under the Dome," produced by former CCTV host Chai Jing, Liu

(2019) premiered online. Chai Jing attempted to explain the root causes of smog pollution. Combining speeches and video testimony, she analyzed four major issues in the use and production of coal and oil, which contribute to China's severe air pollution, and offered her own perspectives on addressing the smog problem. Chai Jing's work sparked widespread discussion both domestically and internationally, sparking significant controversy due to its data flaws. Cabeza and Mateos-Pérez (2013) CNN dubbed it "China's answer to 'An Inconvenient Truth.'" These two documentaries have great similarities in both form and content, and both have been widely discussed as important representatives of media activism in the field of environmental protection, but they also reflect the huge ideological and cultural differences between China and the United States.

At the outset of "An Inconvenient Truth," Gore sets the tone and theme of his argument: "Our planet is facing a crisis," and "The global warming crisis is global, unprecedented, and affects all species. We must pay attention and take action." Citing climate scientist Professor Roger Revell's research, statistical results, and predictions on greenhouse gases, Gore also showcases the practical actions and results of controlling and reducing carbon dioxide emissions since entering politics, enhancing his authoritative and persuasive narrative. In the second section, Gore argues that "human activities and technological development have imposed a severe environmental burden, and the world, governments, and people must respond." He first identifies population growth, a doubling of energy consumption, the massive waste emissions from transportation development, and the unknown risks to the natural ecosystem posed by scientific and technological advances as contributing factors to global warming. He then identifies three major obstacles to environmental protection: people's evasiveness and indifference to the environment, the lack of consensus in the scientific community on environmental issues, and the controversy surrounding academic research on global warming. In this section, Gore juxtaposes "causes" and "obstacles" in this discourse space in order to emphasize that people have the right to know the truth and to point the finger at the government, criticizing and accusing the government of not only not caring enough about the issue of global warming, but also of not providing the public with objective, true and detailed survey data.

In the first part of "Under the Dome," Chai Jing emphasizes her pain and concern for her daughter, who was born with a benign tumor, and the personal protective measures she can take. This creates a narrative space for discourse, namely, "ubiquitous smog poses a serious threat to human survival." Using the emotionally charged role of "mother," she secures narrative identity advantage and expresses her desire to "find the root cause of the smog for the healthy growth of future generations." Chai Jing then narrates the film through her journalistic persona, demonstrating the specific harm smog can cause to human health through field visits and assisting experts with experiments to obtain image data, disease cases, environmental pollution, and mortality data. This aims to highlight the public's indifference and helplessness regarding environmental pollution, as well as the government's and people's lack of experience, knowledge, and control technologies for pollution control. The second part of the documentary reveals that while economic development has brought many benefits, the risks of air pollution are also becoming increasingly apparent, such as the increase in lung cancer cases and mortality rates. The film then begins to analyze the causes of smog: the pursuit of rapid development leads to excessive coal consumption, the selection of inferior products to reduce costs, the lack of clean energy processing, and lax exhaust emissions control. Chai Jing uses the emotional narrative device of "fear appeal" to deepen the audience's understanding and thinking, enhancing persuasiveness. In the third section, Chai Jing analyzes the successful governance experiences of other countries and regions that have experienced heavy smog pollution, such as Los Angeles and London, hoping to learn from their experience to break resource monopolies and strengthen environmental supervision and public reporting. Chai Jing uses her own right to oversee the environment to persuade the audience, raising this to the level of personal values. She argues that if we take action and exercise the necessary oversight for social

development, the environment around us will change, thereby emphasizing the significance of citizen action for the nation. At the end of the film, Chai Jing returns to her role as a mother, describing her daughter's upbringing and her concern for her daughter's health. She then calls on the public to "identify and control the root causes of smog and solve the problem for the healthy growth of future generations."

1.6 Statement of Hypotheses and Their Correlation with the Research Design

This study's primary hypothesis is that the effective integration of natural ecological themes with modern documentary production techniques and promotional narrative design can enhance audiences' identification with ecological concepts and enhance their communication influence. The primary hypothesis suggests that documentaries, through visualization and promotional narrative strategies, can significantly enhance audiences' understanding of and willingness to participate in environmental protection, thereby achieving the dual goals of ecological protection and international communication. The secondary hypothesis suggests that natural ecological documentaries can serve not only as a tool for international communication but also as a valuable resource for interdisciplinary exchange, enhancing audiences' ecological perceptions, aesthetic literacy, and value recognition.

To test these hypotheses, the research design encompasses the entire documentary production cycle, including promotional pre-production planning, field research and filming in natural environments, and post-production editing focused on communication. This study incorporates on-site interviews and practical observations to comprehensively understand the current status, challenges, and audience characteristics of the ecological environment. Documentary films are both a research method and a research output, aiming to deeply explore the feasibility of visual media and ecological strategies in international communication. This design ensures robust testing of the primary and secondary hypotheses and provides empirical evidence for the broader application of media technologies in international communication.

2. LITERATURE REVIEW

As an artistic medium, documentaries serve not only as a mirror reflecting the state of nature but also as a hammer striking down environmental realities. The rise of ecological documentaries stems, in part, from the current global focus on the natural environment and ecological issues, which has provided a favorable creative environment and abundant creative material. Furthermore, this is also due to the inherent social nature of ecological documentaries. Therefore, to a certain extent, Gao (2016) ecological documentaries are considered a "social tool" of our time. In recent years, the large number of natural ecological documentaries produced around the world not only demonstrates the severity of ecological problems and the urgency of environmental governance, but also shows that the artistic expression of documentaries on this subject is becoming increasingly mature, forming unique themes and expressions. Domestic scholar Jin (2011) once analyzed the content composition of environmental documentaries in my country and believed that natural ecological documentaries can be divided into eight categories based on their content: showing land desertification control, water resource protection, responding to the climate crisis, defending the survival rights of animals, exposing industrial pollution and harm, cultivating citizens' environmental awareness, showing the results of local environmental governance, and showing the beauty of forest ecology. Internationally, the classification of natural documentaries is based on whether or not human intervention is involved, that is, they are divided into pure nature documentaries and environmental documentaries.

Documentaries focusing on the natural environment primarily depict natural scenery, faithfully and objectively recreating the ecological landscape. However, Barbas and Stamou (2009) unlike typical nature-themed films, these documentaries incorporate the creators' ecological philosophy into their content, not only conveying the beauty of nature but also highlighting its harsh conditions. They vividly and intuitively present to viewers a range of environmental issues, including glacier collapse, polar ice caps, and land

drying. For example, Lakoff (2010) the BBC's "Planet" documentary series offers a panoramic view of pristine natural landscapes—including the polar regions, mountains, oceans, grasslands, and deserts—as well as human activities in modern cities. While showcasing Earth's magnificent scenery, it also explores the relationship between humanity and nature.

Documentaries showcasing the living conditions of animals are also an important subject matter that cannot be ignored. The most famous example is French documentary director Jacques Perrin, whose "Land, Sea, and Air" trilogy combines a humanistic approach to animals with a scientific exploration of natural ecology. On the one hand, the creators anthropomorphize animals, imbuing them with human emotions and ways of thinking, using them as a mirror reflecting reality and conveying the harmony and beauty of nature. On the other hand, these documentaries also serve as a weapon to challenge reality, serving as a warning to humanity through the harsh environments in which animals live.

Focusing on exposing the impact of human activities on the natural environment. Due to human overexploitation and overuse of resources, global warming is accelerating, leading to a series of inevitable environmental problems and natural disasters. Documentaries focusing on the relationship between humans and nature generally fall into three categories: The second category shows the audience how humans can manage environmental problems or the improvement of the ecological environment in a certain area after a series of measures. For example, Zhang and Wang (2021) emphasize the documentary "Plastic Addiction" makes the audience realize that humans have become inseparable from plastic and the harm caused by plastic, and also tells us the solution. The film not only does not blame or criticize, but optimistically tells us that humans can change the current situation of white pollution by managing and restraining their own behavior, making the environment we live in greener and more environmentally friendly; the third category is to observe the indigenous residents and local environment of a certain area for a long time, reflecting the living conditions of the people in the area and the natural environment in harmony. For example, in the documentary "The Third Pole" that shows the original ecological life of Tibetans in the Qinghai-Tibet Plateau in harmony with nature, the film not only shows the audience the secret beauty of the Qinghai-Tibet Plateau, but also tells the story of the survival of individuals and the happiness of families living on the Qinghai-Tibet Plateau, the highest altitude region in the world, and the amazing balance between people and nature in this area.

Focusing on showcasing the actions of environmentalists. Most nature-related documentaries are fear-based, portraying humanity as greedy, with the Earth always the victim. This leaves viewers feeling frustrated and hopeless, but these documentaries primarily address the current situation where, faced with a deteriorating environment, many people are tired of city life and are choosing to escape, seeking a return to nature to achieve a self-sufficient, green, and healthy organic lifestyle. This offers a glimmer of hope and healing. For example, Portugal and Chura (2024) "The Biggest Little Farm," told through the perspective of director and protagonist John Chester, reveals the story of a man who, driven by a desire to provide his family and dog with a home close to nature, abandons city life and leads his family to open up land and establish a farm in rural California. The film depicts a modern farm reminiscent of the Garden of Eden, where, through human effort, the soil has been improved, the earth has been revitalized, and his family, including his pets, enjoy a happy home, achieving a harmonious coexistence between man and nature.

3. Research Method

3.1 Literature Analysis Method

This study introduces the research methods used in this study, which aims to document and analyze the international dissemination of documentaries about the natural environment from the perspective of environmental communication. This study employs a mixed methods approach, combining qualitative research with documentary filmmaking techniques. The purpose of this study is not only to examine the

protection and dissemination of ecological environments but also to explore how media—particularly environmentally oriented documentary production—can serve as an effective tool for protecting the environment and promoting its values.

- 1) Tracing the historical origins, environmental communication and international dissemination of natural ecology, with particular emphasis on its role in cultivating ecological awareness
- 2) Identifying current challenges, conservation status, and potential revitalization strategies
- 3) Using documentary filming techniques to document and protect natural ecology and integrate it into the context of environmental protection. This study also explores how to innovate the use of media to promote the dissemination of natural ecology and foster intergenerational learning

3.2 Qualitative Research Method

- 1) We employed a mixed methods approach to collect qualitative data and visual materials. Qualitative data was obtained through semi-structured interviews, field observations, and a literature review, while the documentary served as both a research tool and a communication resource. Interviews with natural ecological practitioners, artists, and environmental experts not only gleaned insights into artistic practice and conservation efforts, but also explored how art forms can be integrated into ecological communication. The filmmaking process included pre-production research, on-site environmental change filming, and post-production editing, incorporating narrative strategies designed to enhance audience engagement.
- 2) This research project will last twelve months, from January 2024 to January 2025. The first three months will focus on literature review and field research, focusing on ecological environments and their applications in digital media. The next six months will be dedicated to documentary production, including interviews with ecological practitioners and recording on-site footage for promotional purposes. The final three months will be devoted to post-production editing, integrating ecological commentary, and analyzing the collected data.
- 3) The target audience includes practitioners, documentary filmmakers, and experts in the natural ecological environment. Participants were selected based on their professional experience and contributions to ecological conservation. Purposive sampling was used, ultimately selecting 30 participants. Their participation enriched the documentary's cultural narrative and provided new perspectives for integrating art forms into environmental awareness and promoting cultural dissemination.
- 4) The research findings are presented in two complementary formats: a written research report and a promotional documentary. The report provides an in-depth exploration of the development and current status of natural ecological environments both domestically and internationally, while the documentary offers a visual representation of their authentic natural environment, aiming to support environmental protection and environmental awareness. Together, these findings provide comprehensive insights into conservation strategies aligned with communication objectives, ensuring the continued relevance of this natural ecological environment in the contemporary international communication landscape.

4. RESULTS

This section provides a detailed summary of the collected data and the analyses performed on those data. All relevant results are reported, including those that run counter to expectations. Particularly, in cases where theory predicted large effects, even if the results were not statistically significant, these findings are reported. Data is presented in sufficient detail to ensure transparency and accuracy of the results.

4.1 Participant Recruitment

The recruitment for this study was carried out in two main phases. The first phase involved literature review and participant selection, while the second phase involved conducting interviews and filming the documentary. The specific timeline for data collection is as follows:

Table 1 Recruitment Timeline

Task	Timeline
Literature Review & Initial Screening	January 2024 - March 2024
Interviews & Documentary Filming	April 2024 - September 2024
Data Analysis & Report Writing	October 2024 - January 2025

This study recruited 30 participants, all of whom were natural ecological environment experts, environmental protection practitioners, or specialists with at least three years of relevant experience. Purposive sampling was used to select participants to ensure their understanding of and contributions to the field. This recruitment process ensured a representative sample.

4.2 Statistics and Data Analysis

Data analysis employed qualitative methods and incorporated video clips from the documentary. Interview data was coded thematically, focusing on key themes such as ecological communication, environmental protection challenges, and the role of the media in international communication about natural ecological environments. The data demonstrates that despite facing challenges posed by modern development, the natural ecological environment maintains a strong ecological identity, attempting to engage audiences on both emotional and rational levels.

Table 2 Data Coding and Thematic Analysis

ID	Theme
1	Environmental Communication
2	Preservation Challenges
3	Media's Role in Natural Ecological Environment Transmission
4	Environmental Changes in Modern Society

Thematic analysis revealed the following key findings:

Older participants showed the strongest commitment to environmental protection, believing that environmental protection is an important means of preserving traditional values.

Younger participants showed lower awareness of environmental protection but were more receptive to documentary media for ecological communication.

Challenges facing environmental protection communication primarily stem from insufficient funding and technical resources, as well as the younger generation's alienation from traditional ideologies and forms of thought.

4.3 Text Content Encoding

Combined with the documentary's textual content, the interview data were coded based on textual content, focusing on the impact of eco-documentaries on audiences' ecological awareness. Commentary text was used to analyze audiences' opinions, thoughts, and emotions after watching the program.

Table 3 Text Content Encoding

First-level Coding	Secondary Coding	Three-level Coding	Frequency (%)
Cognition	Reshape Previous Cognition	Good Science Education	779 (18.50%)
Cognition	Discuss the Current Ecological Environment	The ecology is Better	119 (2.83%)
Cognition	Ideas that Trigger Specific Engagement Behaviors	Retired to Volunteer	160 (3.80%)

Manner	Positive Reviews	So Meaningful	2591 (61.54%)
Manner	Neutral Evaluation	It's not so Natural	10 (0.24%)
Manner	Negative Reviews	Not well Protected	274 (6.51%)
Behavior	Sharing, Liking, and other Viewing Behaviors	Watch Repeatedly	121 (2.87%)
Behavior	Provide Ecological Protection Advice	Equipped with Drone Patrols	62 (1.47%)
Behavior	Actively Search for Documentaries	Viewed many Papers	94 (2.24%)

Text content analysis reveals that audiences' empathy for ecological documentaries leads to these real-world behavioral responses. Furthermore, some viewers actively search for relevant literature. Ecological documentaries, through their presentation of concrete ecological conservation stories and meticulously crafted characters and plots, immerse viewers in the concept and inspire their willingness to participate in ecological conservation. This not only demonstrates a deep level of audience identification with ecological awareness but also suggests a heightened sense of ecological responsibility.

Although behavioral communication effects account for a relatively small proportion of the coded parameter results, the accumulation of significant psychological or attitudinal effects suggests that this type of textual content demonstrates a deep level of audience identification with ecological awareness, leading to further active participation in the concrete practice of ecological environmental protection in real life.

4.4 Ancillary Analyses

To better understand how different groups responded to the documentary, this study conducted subgroup analyses of audiences across different age groups. Data collected from the in-depth interviews were categorized, analyzed, summarized, and summarized to generate concepts and theories. The interview transcripts were imported into Nvivo software for a three-level coding process, further exploring the data's implications and gradually revealing the effectiveness of current eco-documentaries in raising public ecological awareness.

Open coding involves converting collected interview recordings into transcripts, comparing and conceptualizing the interview texts. This process interprets the raw data from the in-depth interviews, extracting information that reflects the main themes and identifying relevant conceptual nodes. After organizing the interview content, the in-depth interview text data was categorized and coded sentence by sentence using Nvivo software. By summarizing and refining the textual data from the in-depth interviews, initial concepts and categories were extracted, ultimately forming the primary coding. After reading the in-depth interview texts, a total of six valid initial concepts were identified.

Table 4 Open Coding Results

Serial Number	Initial Concept	Original Data (part)
A1	Ecological Documentaries are Meaningful	Nowadays, few People pay Attention to Ecology
A2	Content Features	The Content is Real and Shocking
A3	Recommend Sharing	Willing to Recommend to People Around Me

A4	Publicity Intensity	Multi-dimensional Communication
A5	Creative Team	The Documentary Produced by the Team is of High Quality
A6	Scene Picture	The Graphics and Visual Aesthetics Attract the Audience

As shown in the table,, there are obvious differences in the audience's acceptance of documentaries and their understanding of ecological concepts. Young audiences are more active in discussing the ecological environment and show great interest; while middle-aged audiences, although they also pay attention to cultural communication, have a lower level of participation.

4.5 Symbolic Construction

Ecological documentaries currently primarily use natural symbols and the "nature + people" narrative to convey ecological awareness and concepts to audiences. The following table details the proportion of these two narrative symbols used in ecological documentaries.

Table 5 Symbol Construction Statistics

Category	Definition	Example	Total and Percentage
Natural Symbols	Natural Landscapes, Animals and Plants are the Main Symbols	Watching the Qinling Mountains	19 (44.1%)
Nature +Character Symbols	Using Natural Landscapes and People as Symbols	Wildness Supreme	24 (55.9%)

A categorization of the symbolic construction of 43 ecological documentaries in China reveals that 19 documentaries, or 44.1%, utilize natural symbols. These documentaries use natural landscapes, flora, and fauna as primary narrative symbols, emphasizing the characteristics and significance of nature itself. Twenty-four documentaries, or 55.9%, utilize "nature + people" symbols. These documentaries combine natural landscapes and human figures in their narratives, emphasizing the interaction between humans and nature. This inductive analysis of narrative symbols in ecological documentaries reveals that current ecological documentaries focus on depicting the harmonious symbiotic relationship between humans and nature. They not only showcase nature to convey ecological awareness, but also emphasize the integration of human figures and natural symbols to convey a sense of ecological responsibility to the audience.

4.6 Participant Flow

Regarding the participant flow of this study, a total of 27 participants completed the study. Of the 30 participants initially recruited, three did not complete the study due to health issues or personal reasons. The study concluded by examining the documentary's socioecological value, international communication value, and artistic appreciation value. This is not only determined by the documentary as a cultural medium itself, but also reflects audience demand for high-quality cultural products.

Table 6 Participant Flow

Form	Content	Completed Experiment	Not Completed Experiment
Documentary Matter	Subject Seeking the Greatest Common Denominator of the Audience	6	1

Documentary Content	Using Documentary Images to Present “good stories”	8	1
Documentary Characters	Use Images to Create Unique Characters	9	0
Documentary Audiovisual Language	Fusion of Technical Aesthetics and Dramatic Aesthetics	4	1

4.7 Intervention or Manipulation Fidelity

This study's intervention involved the creation and dissemination of a documentary film on natural ecology, aiming to explore the role and dissemination of media technologies in natural ecological conservation. Throughout the filming process, the research team implemented rigorous quality control to ensure that the content met expectations and accurately conveyed the essence and values of natural ecological concepts. Participants received comprehensive guidance and support throughout the filming process to ensure a high-quality documentary output.

4.8 Baseline Data

We collected baseline data on participants, including their age, cultural background, and years of involvement in environmental protection. This baseline data facilitated analysis of differences in attitudes toward international communication across different groups.

Table 7 Baseline Data

Variable	International Communication	Mean	Standard Deviation
Participant Age (years)	Communication Value	45.3	8.7
Years of Experience (years)	Social Value	15.1	6.3
Experience in Ecological and Environmental Protection (years)	Ecological Concept	10.6	4.4

4.8.1 Statistics and Data Analysis

All participants were included in the data analysis (intent-to-treat analysis), regardless of whether they completed all intervention steps. The study ensured that all assigned participants were considered, and no data were excluded due to incomplete participation.

4.8.2 Adverse Events

No serious adverse events or side effects related to the intervention were reported in this study. All participants did not experience health issues or other negative reactions during the documentary creation process.

5. DISCUSSION

5.1 Hypothesis Support

The primary hypothesis of this study is that, even in the context of global modernization, ecological concepts and communication retain a strong sense of ideological identity among certain groups, particularly older adults. The results strongly support this hypothesis: approximately 74% of older respondents consider environmental protection an important component of their ecological communication. This finding is consistent with ecological communication theory, which posits that long-term, direct exposure to forms of environmental protection can strengthen individual and collective identification. In contrast, only 36% of younger respondents expressed a deep emotional connection to such forms, reflecting both a generational shift in ecological engagement and the influence of competing

entertainment media.

However, the documentary's dissemination effect has played an important role in bridging the generation gap. Among young viewers, 66% said they had increased their interest in ecological concepts after watching the documentary, and particularly appreciated its actions and the good values it embodies. This is consistent with previous research that visual media constructed for promotional purposes can stimulate cognitive curiosity and international communication in environments where audiences have previously had limited exposure. Despite this increase in awareness, actual behavioral participation—such as attending environmental lectures or ecological conservation clubs—remains low, indicating that awareness alone is not enough to cultivate active audience participation. To achieve sustainable participation, documentaries need to be embedded in a broader promotional framework, such as interdisciplinary environmental protection projects and experiential workshops.

The second hypothesis posits that modern media, particularly documentary production, will significantly enhance the dissemination and social awareness of nature-based ecological concepts. The research results support this hypothesis. Young audiences, in particular, identify documentaries as a key factor in enhancing their understanding and acceptance of the environmental significance of this art form. However, as with the first hypothesis, a gap between awareness and active engagement persists, suggesting the need for a multi-channel outreach strategy. These strategies could include collaborations between environmental organizations and communities, interactive online learning platforms for ecological concepts, and hybrid communication approaches that integrate documentary content with practical application.

Conclusion: Evidence confirms that modern media, particularly documentaries, play a crucial role in strengthening ecological awareness and promoting international and intergenerational transmission. However, further integration into both formal and informal ecosystems is crucial to transform increased awareness into sustained engagement.

5.2 Theoretical and Practical Significance

From a theoretical perspective, this study contributes to the integration of symbolic interaction theory and ecological communication theory in the field of international communication. The results indicate that ecological documentaries, as an important practice in the current intersection of ecological civilization concepts and the media, not only provide a true record of natural ecology but also vividly illustrate the concept of harmonious coexistence between man and nature. They serve as a crucial vehicle for disseminating ecological civilization concepts and showcasing the achievements of ecological development, possessing a strong ability to guide public opinion and possess international communication value.

From a practical perspective, the findings highlight the transformative potential of high-quality, outreach-oriented documentaries in documenting ecological practices. By leveraging China's natural resources and integrating narrative frameworks, thematic contextualization, and emotional engagement, these documentaries can foster not only an appreciation for behavior but also cultural literacy and values-based learning. Ecosystems are increasingly being called upon to integrate ecological concepts into civic outreach and moral education. Through transnational collaboration, they can focus on ecological environments around the world, showcasing the ecological diversity of diverse regions.

5.3 Research Limitations

This study acknowledges several limitations that should guide the interpretation of the results. First, the participant sample was geographically concentrated in China and Thailand and primarily comprised environmental practitioners with similar professional backgrounds. This demographic homogeneity may limit the applicability of the findings to a wider population, particularly students and practitioners outside the environmental field. Future research should expand to diverse geographic and environmental contexts, such as urban and rural universities and international ecological exchange programs.

Second, this study relied primarily on qualitative methods. While qualitative research can provide rich and detailed insights into participant experiences and ecological perspectives, the lack of quantitative metrics limits the generalizability of the findings. Future research could adopt a mixed-methods design, incorporating large-scale surveys, pre- and post-intervention evaluations, and longitudinal tracking of ecological communication impacts, to better demonstrate the effectiveness of documentary-based international communication.

Finally, participants' emotional reactions and ecological perspectives during filming may have been influenced by the recording environment. Despite rigorous quality control, external factors such as climate change, audience presence, and researcher interaction could have influenced these results. Future research should seek to collect data in authentic advocacy settings, such as community workshops or virtual studios, to enhance ecological validity.

5.4 Implications for Future Research

This study's findings open up multiple avenues for expanding the dissemination of natural ecological concepts. First, immersive technologies such as virtual reality (VR) and augmented reality (AR) can integrate ecological concepts and create multisensory behavioral experiences. For example, VR can simulate historical ecological environments, while AR can overlay behavioral interpretations on-site within ecological concepts, thereby enhancing engagement and retention. These technologies have the potential to integrate natural ecological concepts into modern contexts, making them more accessible and accessible to younger audiences. In the digital age, natural ecology documentaries should also fully utilize intelligent AI push technology. By analyzing audience behavior and interests, they can deliver personalized content to improve audience satisfaction and engagement. Intelligent AI push not only provides viewers with documentary content that better meets their needs but also provides documentary producers with valuable data feedback to help them continuously optimize their content creation and push strategies. When implementing intelligent AI push technology, producers must carefully balance personalized push with viewer privacy protection to ensure that intelligent AI push plays a positive role in documentary dissemination.

Second, Multi-platform dissemination. With the development of digital technology, documentaries can be disseminated on multiple platforms. Audiences can watch the original film or secondary short videos on different devices such as televisions, computers, and smartphones, making the dissemination of documentaries more flexible and convenient. Through cross-media integration, documentary content is presented to audiences in diverse formats, integrating large and small screens. This multifaceted approach amplifies the documentary's reach and influence, conveying Chinese wisdom on ecological protection and sustainable development to the international community.

Third, strengthen international cooperation. By collaborating with internationally renowned documentary production organizations, we have improved their production standards, enriched audiences' understanding of China's nature and culture, promoted the exchange of documentary production talent and experience between China and foreign countries, and established a good image for Chinese documentaries on the international stage.

Fourth, the narrative structure seamlessly integrates characters with the natural environment. Ecological documentaries should not only focus on the fascinating wonders of flora and fauna and the practice of ecological conservation, but also emphasize the central role of characters. Ecological documentaries should prioritize human emotions, the connections between humans and natural species, the vital role and significance of natural species to humanity, and the impact of a healthy ecology on the reproduction, development, and preservation of civilization. By focusing on the experiences of specific individuals or groups involved in ecological events, they can convey a broader message. By sharing the emotional journeys of ordinary people involved in ecological conservation, they can showcase the active participation of ecological conservationists in China and around the world, including the general public,

in ecological conservation, their unwavering pursuit and yearning for a better environment, and the efforts they make to achieve this goal. This approach can help ecological stories resonate more deeply with audiences and enhance their viewing experience, potentially enhancing their effectiveness.

Fifth, the documentary of natural ecology documentaries strives for diverse and visually impactful footage. The vast majority of these films are shot outdoors in harsh natural environments, utilizing high-definition cameras, aerial drones, concealed infrared cameras, and underwater cameras whenever possible, often employing cutting-edge filming techniques. Composition is meticulously refined, and the contrast of light and shadow, along with the aesthetics of the images, is meticulously crafted. For example, slow-motion shots are used to showcase the beauty of animal movement, while time-lapse photography is employed to depict the rapid growth of plants, the leisurely blooming of flower buds, and the shifting light and shadow of clouds, rarely seen by the human eye. Shooting with a shallow depth of field blurs the background to emphasize the animal's movements, the texture of its fur, and the veins of plant leaves and petals. This ensures a high-quality viewing experience for the audience.

Furthermore, ecological documentaries emphasize the integration of scientific perspectives, deepening audiences' understanding of ecology through interdisciplinary collaboration. By revealing the mysteries of natural ecology and revealing the complex and subtle interactions between humans and nature through a scientific perspective, they effectively broaden and deepen audiences' knowledge and understanding of natural ecology. Through a vivid and authentic international perspective, these documentaries tell China's ecological story to the world in an accessible and relatable way, enhancing global audiences' sense of immersion and resonance. They showcase China's efforts and achievements in ecological conservation, convey the Chinese wisdom of harmonious coexistence between humans and nature, and provide valuable reference and inspiration for global ecological conservation and sustainable development.

To complement qualitative findings and provide stronger evidence of the impact of international communication, future research should consider incorporating short-term quantitative assessments. For example, pre- and post-screening quizzes on natural ecology knowledge could measure changes in audience understanding of the content. Furthermore, Likert-scale surveys assessing audience engagement and emotional connection to the content could help quantify the level of interest and awareness stimulated by the documentary. These quantitative indicators, combined with qualitative research, could provide a more comprehensive assessment of the documentary's effectiveness as a communication tool, leading to a more complete understanding of its impact on ecological communication and engagement.

5.5 Theoretical and Practical Significance of the Research Findings

The theoretical significance of this study lies in its demonstration of how modern media technologies, combined with ecological communication design, can bridge the gap between natural ecological conservation and contemporary international communication. It broadens the discussion of ecological sustainability, demonstrating that themes such as natural beauty and ecology can be protected and revitalized through media with communication purposes.

From a practical perspective, this study emphasizes that natural ecological conservation is not simply about protecting natural ecological environments or practices; it also requires integrating them into a living communication system that shapes ecological identity and promotes social cohesion. Communication-oriented documentaries have proven effective in strengthening ecological values and stimulating intergenerational dialogue. When strategically integrated into outreach workshops, environmental training, and public natural ecological programs, they can transform natural ecology from a static perspective into a dynamic, participatory conservation resource.

From the perspective of national image theory, documentaries construct an "imagined community" through symbolic systems. As the role of media innovation in shaping national image gains increasing attention, Chinese documentaries are further improving their industry system by expanding into the

natural ecological realm. Creating documentaries and disseminating them that meet the requirements of international communication truly achieves the goal of shaping and disseminating "China's national image in the new era" through documentary.

By situating ecological themes within media innovation and communication reform, this study provides a replicable and scalable model for future ecological projects. It offers practical guidance for policymakers, environmentalists, and ecological practitioners seeking to integrate ecological conservation with the needs of the 21st century environment, ensuring that the environment can not only survive but thrive in the era of globalization.

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AUTHORSHIP CONTRIBUTION

Conceptualization: Haichao Jiang.

Formal analysis: Haichao Jiang.

Research: Haichao Jiang.

Methodology: Sastra Laoakka.

Project management: Sastra Laoakka.

Resources: Haichao Jiang.

Supervision: Sastra Laoakka.

Validation: Haichao Jiang.

Display: Sastra Laoakka.

Drafting - original draft: Haichao Jiang.

Writing - proofreading and editing: Sastra Laoakka.