

## **K-Drama as Ecocinema? A Multimodal Analysis of Climate Change Representation in 60 Globally Popular Korean TV Dramas**

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This study examines climate change themes in 60 globally popular South Korean dramas (2019–2024) using network, sentiment, and framing analyses and drawing on ecocinema. The results show that climate change topics represented only 0.36% (4 hours) of 1,135 total viewing hours. Despite Korea's environmental challenges, only 26 dramas included climate-related content, primarily addressing recycling and eco-friendly practices. Our study provides the first systematic investigation of climate change narratives in Korean TV dramas. It highlights their potential to shape environmental awareness and introduces a replicable methodological framework integrating computational and longitudinal analyses. Integrating ecocinema into Hallyu studies is crucial as it (1) expands Hallyu's thematic scope beyond family, history, gender, and class to include underexplored environmental issues; (2) leverages K-dramas' global reach to enhance climate change awareness through serialized storytelling; and (3) addresses the dominance of Western media in ecocinema studies by incorporating East Asian television narratives.

*Keywords: climate change, computational social science methods, ecocinema, framing, Hallyu, TV dramas*

Scripted entertainment, including cinema and television, powerfully mirrors and addresses global and local social issues (Manning & Suarez Lopez, 2023). A recent U.S. audience survey revealed that 77% of respondents learned about social issues at least occasionally through these forms of entertainment (Giaccardi et al., 2022). Film and TV narratives inform audiences' understanding and inspire them to act

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(Giaccardi et al., 2022). The report of the Intergovernmental Panel on Climate Change (IPCC, 2023) underscored the severe risks posed by rising temperatures, called for a comprehensive research agenda to address catastrophic climate scenarios, and emphasized the importance of integrating climate change discussions into media content. In Western contexts, climate communication in film and television often emphasizes large-scale political conflict, apocalyptic futures, and individual activism (Schneider-Mayerson et al., 2024). By contrast, Korean narratives frequently foreground collective well-being, social harmony, and everyday practices (Kim, 2019a; Yoon & Jin, 2023).

Despite these pressing calls, climate change is rarely featured in scripted TV dramas, films, or popular music. Recent research from the Norman Lear Center, at the USC Annenberg School for Communication & Journalism, analyzing 37,453 scripted TV episodes and films, mainly from the United States, from 2016 to 2020, found that only 2.8% incorporated climate change-related words (Giaccardi et al., 2022). By comparison, the word “dog” appeared 13 times more frequently than all climate change keywords combined. Mainstream Western entertainment continues to sideline environmental issues, privileging spectacle or romance over systemic critique (Bond et al., 2017; Johns-Putra, 2016; Schneider-Mayerson, 2019).

In their climate change study, Schneider-Mayerson et al. (2024) applied a “climate reality check” (CRC), a binary evaluation they developed to assess climate narrative representation in a film based on two criteria: (1) whether climate change exists in the storyline and (2) whether any character acknowledges it. Meanwhile, Schneider-Mayerson (2024) analyzed the 250 most popular films from 2013 to 2022 and found that only 12.8% acknowledged climate change, 9.6% included a climate change-aware character, and 2% featured a character experiencing climate anxiety (Schneider-Mayerson et al., 2024). Both studies urged greater inclusion of climate themes in media, with 48% of audiences wanting more climate-related content (Schneider-Mayerson et al., 2024). In this context, we explore the role of South Korean TV drama series (K-dramas) in acknowledging climate change and ask how globally popular K-dramas address this issue.

K-dramas offer a unique non-Western lens for exploring climate narratives due to (1) their state-industry-driven production model, (2) serialized formats fostering sustained viewer engagement, and (3) rapid global diffusion across regions such as Southeast Asia and South America, according to the Korean Foundation for International Cultural Exchange (KOFICE, 2024). In contrast to standalone Western media, K-dramas enable innovative climate communication by embedding environmental themes in extended storytelling and collective cultural values.

South Korea faces pressing environmental challenges: It remains one of the highest per capita CO<sub>2</sub> emitters (11.04 tons/person in 2023), primarily due to its fossil-fuel dependency and industrial intensity (Country Economy, 2023). Air pollution is severe, with PM<sub>2.5</sub> levels averaging 17.04 µg/m<sup>3</sup>, 3.4 times above the World Health Organization (WHO) limits, reducing life expectancy and affecting the entire population (Kim et al., 2025; Statista, 2024).

Despite these vulnerabilities, ecological themes remain scarce in South Korean media, yet K-dramas have cultural influence and global reach. Productions like *Forecasting Love and Weather* (Pyo, 2022). and *Parasite* (Lee et al., 2019) demonstrate how narrative media can humanize scientific data and catalyze

awareness and action (Signisasia, 2020). As central pillars of Hallyu (Korean Wave), K-dramas are well-positioned to bridge the gap between environmental urgency and cultural discourse (Charalambous, 2020; Jin, 2023).

Research on Korean scripted storytelling in the climate change context remains exceedingly sparse. Studies on K-drama have predominantly focused on gender dimensions (Zahra & Athalarik, 2022), ideological tendencies within Hallyu (Boman, 2022), and employment empowerment (Kim, 2024). Thus, we are interested in analyzing how K-dramas represent and frame climate change. We ask the following research question:

*RQ1: How is climate change represented in K-dramas, drawing on framing analysis (Entman, 1993; Goffman, 1974) and sentiment analysis?*

We apply ecocinema (MacDonald, 2012) and framing theory (Entman, 1993; Goffman, 1974), combined with computational sentiment and network analyses, to answer this research question. This mixed-method design, unprecedented in K-drama studies, allows us to trace both the frequency of climate references and the narrative frames in which they appear. By comparing K-dramas and Western climate storytelling, we explain how cultural context shapes environmental narratives and identify opportunities for more inclusive, globally resonant ecocinema.

## Literature Review

### ***Hallyu Research from a Methodological Viewpoint***

Hallyu dominates the global market in its many divisions, including music, games, fashion, movies, and dramas. In 2021, exports attributed to Hallyu reached USD11.6 billion, with dramas and movies experiencing a surge of over 51% in consumption following the COVID-19 outbreak (KOFICE, 2022). Previous research has examined K-dramas from various angles, including how they are consumed by global audiences (Ju, 2019; Locher & Messerli, 2020) and the adaptation of local industries to global streaming platforms (Kim, 2022).

Methodologically, only several of the existing studies on K-dramas have adopted quantitative methodologies, such as exploratory factor analysis and structural equation modeling, using questionnaire data (Kim et al., 2012). Mixed-methods research combining content analysis with statistics is rare (Pasupathy et al., 2022). Few studies have applied computational methods. Cho et al. (2022) examined deep learning models for facial emotion while Pant et al. (2022) analyzed text-based, and Park and Kim (2021) studied emotion recognition for verbal abuse detection. However, these studies have not examined the drama content itself but used it to train models. Table 1 ([https://crmelchior.github.io/k-drama\\_climate\\_change/#related-works](https://crmelchior.github.io/k-drama_climate_change/#related-works)) summarizes and compares some related work, mainly the previous quantitative studies on K-dramas.

In the context of climate change research, many studies (Chen et al., 2024; Su et al., 2024) have employed quantitative methods, but they do not relate to TV dramas or Hallyu. However, most studies

exploring specific themes presented in K-dramas have emphasized qualitative methods (e.g., Boman, 2022). Our study employs a more focused data analysis approach by incorporating framing analysis and ecocinema.

### ***Ecocinema, Framing Analysis, and Korean TV Dramas***

Ecocinema studies examine the depiction of nature and ecological themes in film, increasingly emphasizing environmental commitment by foregrounding nature in storytelling (MacDonald, 2012). Although the field has primarily focused on documentaries, scholars argue for greater engagement with popular scripted media due to its cultural reach and potential for shaping public attitudes (Ingram, 2012). A critical gap remains in analyzing how environmental narratives are framed within scripted formats such as TV dramas. Applying an ecocritical lens to K-dramas offers a valuable opportunity to assess how ecological issues are represented, or neglected, in globally disseminated entertainment media.

Framing theory, as defined by Entman (1993), explains how selective emphasis in messaging influences audience interpretation by highlighting certain elements while obscuring others. In television narratives, framing operates through both visual and textual elements, shaping perceptions of identity, morality, and social norms (Goffman, 1974). These portrayals have tangible social effects: Young viewers exposed to submissive female characters or racially biased depictions may internalize harmful stereotypes, shaping aspirations and social interactions (Mastro & Greenberg, 2000; Zummo, 2023).

Extensive research has examined media framing's impact on cultural narratives and marginalized communities. Studies have analyzed representations of minority groups, showing their role in either reproducing or resisting dominant ideologies (Frank & Phillips, 2013; Zummo, 2023). Broader meta-analyses, such as Walter and Ophir (2024), have revealed disciplinary silos, methodological fragmentation, and gender disparities in framing research. Similarly, Araújo and Guazina (2024) demonstrated how crisis reporting in television news employs framing to shape public understanding during emergencies. Table 2 ([https://cirmelchior.github.io/k-drama\\_climate\\_change/#framing-analysis](https://cirmelchior.github.io/k-drama_climate_change/#framing-analysis)) presents the key empirical results from the reviewed studies, specifically categorized under Entman's (1993) four framing functions. This structure facilitates the comparative analysis of how different studies operationalize these dimensions to make certain aspects of perceived reality more salient in a communicating text.

Table 2 illustrates that while Entman's (1993) framing model is broadly applicable, its implementation significantly varies by sociopolitical context. U.S. media often emphasizes conflict and individual responsibility, whereas Chinese media favors collectivist narratives and downplays moral blame. Notably, the absence of certain framing dimensions, such as causal attribution and moral evaluation, can shape public discourse as powerfully as their inclusion.

Our analysis extends Entman's (1993) framework by applying it to fictional, serialized content, specifically K-dramas, through computational methods. Unlike prior studies focused on news or policy, this research integrates framing theory with ecocinema and sentiment analysis to examine how environmental narratives are constructed in entertainment media. Methodologically, it offers an interdisciplinary and scalable approach, combining mixed methods to track climate narratives across K-dramas. This innovation

enhances the empirical scope of framing theory and demonstrates its applicability to non-Western, globally influential media.

### **Methodology: Research Data and Methods**

This study analyzed 60 globally popular K-dramas from 2019 to August 2024, totaling approximately 1,135 hours of content. Each series was fully viewed by at least one researcher.

Given the absence of public viewership data from major platforms (e.g., Netflix, Disney+, Amazon Prime), we used votes and likes as proxies for popularity. We included both upvotes and downvotes to reflect overall audience engagement and interest, rather than approval alone. The top 10 dramas per year were selected based on combined vote counts across platforms. These were cross-referenced with FlixPatrol data (2020–2024) to validate consistency and benchmark global trends, despite FlixPatrol's limitations (e.g., lack of crowdsourced inputs and raw figures).

We first selected the K-dramas that appeared on most platforms and then compiled the 10 with the most votes, summing the votes from all platforms. To further validate our sampling approach, we subscribed to and incorporated data from FlixPatrol, which tracks streaming content popularity based on aggregated platform rankings (e.g., Netflix "Top 10"). Although FlixPatrol covers only the years 2020–2024 and does not provide raw viewership figures or include IMDb or MyDramaList data, it serves as a valuable benchmark for assessing broader viewer engagement trends.

English subtitles were collected for all dramas and analyzed using a climate change keyword list (adapted from Giaccardi et al., 2022) comprising 73 terms (e.g., "climate," "emission," "pollution," and "natural disaster"). We applied *RegEx* and lemmatization to capture variations in word forms. Climate-relevant scenes were identified through keyword searches, followed by a multimodal analysis of text (subtitles), images (scenes), audio (vocal tone), and video (episode) to contextualize environmental messaging within K-drama narratives.

### **Data Analysis: Quantitative and Computational Analyses**

We employed a computational mixed-methods approach to analyze climate discourse in 60 K-dramas. Subtitles from all episodes were processed using a curated list of climate-related keywords, yielding 306 initial matches across 180 episodes from 48 dramas. Two coders manually reviewed each scene to assess contextual relevance, ultimately identifying 158 relevant scenes (51.63%) from 26 K-dramas. The remaining 148 instances were excluded due to nonenvironmental uses of keywords (e.g., metaphorical references to "atmosphere").

To ensure reliability, an initial subset of 55 results was double-coded, with discrepancies resolved through discussion. The rest were coded by individual researchers. Interrater reliability for coding scenes, sentiments (positive, negative, neutral), and climate themes (e.g., eco-friendly behavior, global warming, recycling) was calculated at 92%, with final consensus achieved on all cases.

Subtitle scraping was performed using Python (v3.12.4) with Beautiful Soup and NumPy. Sentiment and network analyses were conducted in R (v4.3.2) using *igraph*, *purrr*, *stringr*, *dplyr*, and *ggplot2*. We manually annotated start/end times, sentiment classification, and thematic category for each relevant scene.

### **Data Analysis: Qualitative Analysis**

To complement the computational analysis, we conducted a qualitative content and framing analysis of the identified scenes, drawing on ecocinema theory (MacDonald, 2012) and Entman's (1993) four framing dimensions: (1) problem definition, (2) causal interpretation, (3) moral evaluation, and (4) treatment recommendation. For each scene, coders examined dialogue and visual cues to identify the following: (a) What is defined as the climate-related problem? (b) Who or what is portrayed as responsible? (c) What moral judgment and emotional tone are expressed in the context of the issue being framed? (d) Are any responses—individual, institutional, or societal—suggested?

Table 3 ([https://cirmelchior.github.io/k-drama\\_climate\\_change/#k-drama-analysis](https://cirmelchior.github.io/k-drama_climate_change/#k-drama-analysis)) summarizes the top 10 globally popular K-dramas (2019–2024) with the highest number of audience votes. For each, we report the number of scenes containing climate-related keywords (included results), excluded scenes, and an average narrative intensity score (1–5). Genre classifications were based on IMDb.

Figure 1 ([https://cirmelchior.github.io/k-drama\\_climate\\_change/#figure-1](https://cirmelchior.github.io/k-drama_climate_change/#figure-1)) illustrates the distribution and intensity of climate-related dialogue across all 60 K-dramas. Most references were infrequent and peripheral, appearing in isolated episodes with low narrative intensity (scores of 1–2). *Forecasting Love and Weather* (Pyo, 2022) was a notable outlier, consistently integrating climate themes across episodes. In contrast, series such as *The Uncanny Counter* (Kim & Kim, 2020) showed high-intensity mentions only in season 1 in select episodes (e.g., 4, 8, 9), embedding environmental themes within key plotlines related to regulation, ecosystems, and public concern.

### **Results and Discussion**

Our analysis of 60 globally popular K-dramas (2019–2024, totaling 1,135 hours) reveals that explicit climate change content constitutes just 0.36% of total screen time, approximately four hours across 26 series, comprising 158 climate-relevant scenes out of 306 references (Table 3). Natural disasters were the most frequently depicted theme (30 scenes in 15 dramas), followed by recycling (22 scenes in 16 dramas), eco-friendly practices (12 scenes in 10 dramas), and human-made disasters (seven scenes in six dramas). Sentiment analysis shows recycling is framed positively or neutrally, while global warming and disaster scenes carry predominantly negative sentiment.

Qualitative analysis indicates climate narratives are framed either institutionally (e.g., the Korea Meteorological Administration [KMA] in *Forecasting Love and Weather* [Pyo, 2022]) or personally, through characters' eco-anxieties, as seen in *Happiness* (Hong, 2021). Key examples include environmental impact assessments in *Extraordinary Attorney Woo* (Lee, 2022; Table 4), satirical use of eco-language in *Crash Landing on You* (Jang, 2019, 2020), and flood scenarios in *Hometown Cha-Cha-Cha* (Jo, 2021).

We interpret frequency and sentiment measures through representative scenes to bridge computational and qualitative insights. For instance, the high frequency and negative tone of natural disaster portrayals are exemplified by *Hometown Cha-Cha-Cha* (Yu, 2021b), where extreme weather disrupts medical services. In contrast, the neutral tone of recycling is illustrated in *The King: Eternal Monarch* (Baek, 2020), where it features humorously in police training. These patterns align with climate reference intensity (Figure 1) and network centrality (Figure 2), highlighting *Forecasting Love and Weather* (Pyo, 2022) and *Extraordinary Attorney Woo* (Lee, 2022), as narrative hubs for environmental themes.

### **Qualitative Content Analysis**

We conducted an in-depth qualitative analysis of selected climate-related scenes, particularly from dramas listed in Table 4, contextualizing dialogues, characters, and narrative structures.

#### *Themes of Climate Change in Korean TV Dramas*

Applying Schneider-Mayerson et al.'s (2024) CRC, which assesses climate narratives based on storyline inclusion and character acknowledgment, we find *Forecasting Love and Weather* (Pyo, 2022) to be a standout example. Unlike the majority of mainstream media, where only 9.6% of 250 top global films from 2013 to 2022 meet the CRC, this drama embeds climate awareness directly into its institutional and character arcs.

Set within the KMA, *Forecasting Love and Weather* (Pyo, 2022) portrays climate-conscious protagonists, notably Chae Yoo Jin, a weather reporter whose commitment to climate journalism is constrained by commercial pressures. In episode 1, her attempt to publish an article on global warming is dismissed by her editor with the remark "That's how you sell air conditioners" (Pyo, 2022, 00:29:03) (in Table 5, [https://crmelchior.github.io/k-drama\\_climate\\_change/#table-5](https://crmelchior.github.io/k-drama_climate_change/#table-5)). This scene illustrates Entman's (1993) problem definition function by portraying the suppression of climate narratives in commercial newsrooms as a key obstacle to raising environmental awareness.

Chae Yoo Jin's climate-conscious attitude is reinforced by visual cues in her office, such as environmental books and articles, yet her climate advocacy remains a personal subplot, never evolving into a central narrative arc. This lack of narrative continuity around her environmental concern illustrates how climate issues are often fragmented and peripheral rather than structurally integrated into character or plot development.

In addition, this dialogue (Table 5) illustrates the presence of climate narratives in the media industry and reveals a deeper normative tension between journalistic integrity and commercial pragmatism. Chae Yoo Jin's concern for climate awareness aligns with ethical values of public responsibility and environmental stewardship, while her editor's response prioritizes market-driven logic and advertiser satisfaction. This reflects Entman's (1993) causal interpretation frame by attributing the marginalization of environmental content not to a lack of interest by journalists, but to structural commercial pressures.

This prioritization highlights a norm where economic gain supersedes environmental concern. The editor's tone also reinforces a hierarchical power dynamic that marginalizes critical environmental reporting, suggesting such narratives are risky or unprofitable. In Entman's (1993) terms, this also serves as a moral evaluation frame, contrasting the journalist's ethical commitment to the public good with the editor's utilitarian focus on profit. This conflict between professional ethics and commercial survival reflects a broader societal challenge in embedding sustainability within profit-oriented systems. Moreover, the editor's rhetorical question "Do you think people are interested in global warming?" (Pyo, 2022, 00:28:49) implies a cultural norm of climate apathy or disengagement, pointing to a societal undervaluing of long-term environmental issues in favor of short-term consumer comfort.

The drama further emphasizes the KMA's institutional awareness and responsibility for addressing the climate crisis. This role is depicted in scenes in which the main characters Jin Ha Kyung and Han Ki Jun publicly represent the KMA when addressing the press on climate-related issues.

Jin Ha Kyung, portrayed by Park Min Young, is the director at KMA headquarters and is depicted as highly knowledgeable and skilled in her field. Her character frequently leads discussions on the impacts of climate change, both on the headquarters floor and during press conferences. Table 6 presents dialogue from one of these scenes. This portrayal illustrates Entman's (1993) treatment recommendation framing dimension by presenting Jin as a proactive and knowledgeable leader with a strategic approach to climate issues. The emphasis on clear action plans conveys competence and readiness of the KMA's institutional commitment to addressing climate change, thereby legitimizing its role in the broader environmental discourse.

Han Ki Jun, portrayed by Yoon Park, serves as the KMA spokesperson, regularly engaging with the press on the agency's behalf. In episode 2, he reassures the public, stating the KMA will "handle this climate crisis" (Pyo, 2022, 00:22:02) by "strengthening interdepartmental relationships and doing our best to protect everyone from meteorological disasters" (Pyo, 2022, 00:22:08). This portrayal, presented in Table 6 ([https://crmelchior.github.io/k-drama\\_climate\\_change/#table-6](https://crmelchior.github.io/k-drama_climate_change/#table-6)) reinforces the KMA's central role as Korea's primary governmental institution tasked with addressing climate change and mitigating its impacts.

In *Extraordinary Attorney Woo* (Yu, 2022), the environmental lawsuit concerning the Haengbok-ro road project is driven by the titular character's client, a Buddhist monk, objecting to environmental destruction. The monk's backstory, rooted in spiritual reverence for nature and community preservation, provides a culturally specific frame for environmental justice, one grounded in Confucian-Buddhist ethics rather than Western activist paradigms. Attorney Woo's legal reasoning aligns with procedural logic, but the case ultimately resolves through a compromise that favors development, reflecting broader national tensions between modernization and sustainability. This encapsulates Entman's (1993) problem definition frame by presenting environmental protection as being structurally constrained within a legal and economic system biased toward development.

The episode offers a valuable framing of systemic failures, yet this framing remains case-specific, without recurring in subsequent episodes. This pattern reflects a standard limitation in K-dramas:

Environmental themes are often raised episodically without becoming part of long-term character development or serial narrative progression.

The Haengbok-ro road project illustrates the tension between environmental preservation and economic development. A Buddhist monk opposes the project due to its destruction of sacred natural land, embodying a Confucian-Buddhist ethic that views nature as morally significant and spiritually interconnected with human duty. His stance contrasts with the utilitarian approach of state officials, who prioritize infrastructure and public benefit. Attorney Woo challenges the legality of a delayed environmental impact assessment, reflecting faith in institutional processes. However, the court's resolution, permitting construction with compensatory cultural tourism, reveals a prevailing development-first logic. This reflects Entman's (1993) moral evaluation frame, highlighting a normative clash between traditional ecological reverence and modern economic rationality.

This outcome suggests spiritual and ecological concerns are negotiable within growth-oriented systems. Thus, it highlights a broader cultural conflict: modernization versus traditional ecological ethics. While the monk's perspective is treated sympathetically, it is ultimately subordinated to state planning. Visual contrasts between serene temples and invasive construction underscore the marginalization of alternative value systems in dominant development narratives.

*Happiness* (Hong, 2021) features another character who meets the criteria of the CRC. This K-drama follows a special agent and a detective investigating a mysterious disease outbreak while quarantined in an apartment complex. The supporting character Kim Se Hun, portrayed by Han Joon Woo, is depicted as a "doomsday prepper" tenant who expresses explicit concern over global warming. Table 7 ([https://crmelchior.github.io/k-drama\\_climate\\_change/#table-7](https://crmelchior.github.io/k-drama_climate_change/#table-7)) details an exchange between Kim and the main character Yoon Sae Bom (portrayed by Han Hyo Joo). Kim states, "The Earth is in danger right now. . . . Extreme weather, global warming, nuclear war, AI. . . . Extinction is coming soon" (Hong, 2021, 00:51:01). Wearing a hazmat suit, Kim invites Yoon into his apartment, showing her his extensive collection of survival supplies, further underscoring his awareness and anxiety about environmental and global threats.

As illustrated in Table 7, character Kim Se Hun in *Happiness* (Hong, 2021), a survivalist figure, further exemplifies the fragmentation. Kim's anxieties about global warming and ecological collapse are introduced through both dialogue and setting; his hazmat suit, stocked rations, and reference to "extinction scenarios" frame him as both perceptive and eccentric. However, the show provides no backstory to contextualize his fears, nor does it revisit or deepen his perspective in later episodes. This aligns with Entman's (1993) problem definition frame by presenting climate anxiety not as a legitimate concern, but as a fringe or isolated trait lacking narrative development.

His depiction contributes to a frame of environmental concern as fringe paranoia rather than offering a sympathetic exploration of climate anxiety. This narrative gap weakens the potential for audiences to emotionally connect with environmental issues on a sustained basis.

This obsession with disaster preparedness is a recurring theme and is reflected in the characters' daily lives. What appears as casual dialogue subtly conveys norms of personal responsibility and survivalism in the face of climate-related anxieties. This framing reflects a shift from collective environmental action to individualized risk management, aligning with neoliberal values that privatize climate resilience. This shift also reflects Entman's (1993) moral evaluation frame, where the normalization of personal burden over institutional responsibility reveals a critical stance on how environmental crises are socially managed.

The humor in character tone introduces an emotional distance from or normalization of crisis, masking more profound social unease. The absence of institutional presence in this moment highlights a conflict between state inaction and personal burden and reveals a broader cultural adaptation to living with a permanent threat rather than preventing it.

Thus, the examples collectively illustrate that while climate issues appear in globally popular K-dramas, they are often briefly acknowledged rather than structurally developed. Characters expressing environmental awareness are not given extended arcs or transformative journeys related to ecological engagement. This absence reflects a broader trend in K-dramas: Environmental themes are treated as narrative accessories instead of core story engines. This reinforces the problem definition frame (Entman, 1993) by emphasizing the structural marginalization of climate issues in serialized storytelling.

By highlighting the backstories, sociocultural contexts, and structural marginalization of climate concerns within character arcs, our study adds depth to the ecocinema and framing analysis, revealing what is shown and what is left undeveloped or deferred.

#### *Themes of Recycling on Korean TV Dramas*

Of the 158 climate change-related scenes in our data set, recycling appears in 22 scenes across 16 dramas, in which it is consistently framed as a normative, everyday behavior. These scenes often show recycling bins and include dialogues on recycling practices, with characters asking if items are recyclable or receiving feedback on their recycling habits. Table 8 ([https://crmelchior.github.io/k-drama\\_climate\\_change/#table-8](https://crmelchior.github.io/k-drama_climate_change/#table-8)) shows a scene from the 2020 drama *The King: Eternal Monarch* (Choi & Yoon, 2020), in which the main character, a policewoman, instructs a rookie officer on the proper way to recycle plastic bottles as part of her initial training. While partly used for comedic effect, this scene reinforces the societal importance of recycling. The frequent visual emphasis on recycling across dramas establishes it as a routine and socially expected practice.

#### *Themes of Eco-Friendliness on Korean TV Dramas*

The eco-friendly theme appears in 12 scenes across 10 dramas in our data set, where it is portrayed in contexts ranging from serious discussions on environmental responsibility to instances of comic relief. For example, company leaders discuss eco-friendly development strategies in *The Penthouse: War in Life* (Cho, 2020) and *The Uncanny Counter* (Kim & Kim, 2020), embedding environmental consciousness into the storyline. In contrast, *Crash Landing on You* (Kim & Lee, 2020, 00:33:50; episode 7, presented in Table 9,

[https://cirmelchior.github.io/k-drama\\_climate\\_change/#table-9](https://cirmelchior.github.io/k-drama_climate_change/#table-9)) humorously uses the term “eco-friendly living space” to describe an apartment full of farm animals. Similarly, in *Hometown Cha-Cha-Cha* (Yu, 2021a, 00:05:01), the term “eco-friendly atmosphere” is playfully used to refer to the main character’s house with outdated wallpaper, blending environmental themes with lighthearted elements.

### *Themes of Natural Disasters in Korean TV Dramas*

The natural disaster theme appears in 30 scenes across 15 dramas in our data set, with flooding being one of the most frequently depicted forms. Flood-related scenes are typically portrayed with negative sentiments, often highlighting the disruption and distress experienced by the characters. For instance, in the drama *Hometown Cha-Cha-Cha* (Jo, 2021), a flooding event causes a pregnant woman to go into labor at a dentist’s home rather than at a hospital, as road access is blocked by rockslides and floodwater, preventing her husband from reaching her. The dialogue from the scene is detailed in Table 10 ([https://cirmelchior.github.io/k-drama\\_climate\\_change/#table-10](https://cirmelchior.github.io/k-drama_climate_change/#table-10)). This theme emphasizes the serious impact of natural disasters on daily life and community safety.

Our content analysis showed that of the 60 globally popular K-dramas, only six scenes in two dramas entirely passed the CRC. Five scenes directly addressed climate change, four of which appeared in *Forecasting Love and Weather* (Pyo, 2022). *Happiness* (Hong, 2021) also featured a scene meeting the CRC criteria.

### ***Production Context: Genre, Format, and Distribution***

The 60 K-dramas analyzed encompass diverse genres (romance, fantasy, legal, comedy, thriller, historical, and slice-of-life), with romantic drama and coming-of-age being the most prevalent. Genre conventions shape how climate issues are portrayed: Everyday practices like recycling or weather reporting emerge in romance and slice-of-life series (e.g., *Forecasting Love and Weather*, Pyo, 2022; *Hometown Cha-Cha-Cha*, Jo, 2021), while thrillers or speculative dramas (e.g., *Happiness*, Hong, 2021) occasionally frame climate change within apocalyptic scenarios, though without sustained focus.

In terms of format, nearly all sampled shows follow the standard K-drama structure of a fixed-length arc and with 16–20 episodes (except for *Beauty and Mr. Romantic* [Park & Hong, 2024], with 50 episodes, and *Angel’s Last Mission: Love* [Choi, 2019] and *Extraordinary You* [Kim, 2019b], both with 32 episodes). This format lends itself to compact, serialized storytelling with clear resolutions, which can limit long-term thematic development, particularly for complex or systemic issues like climate change. The finite episode structure encourages narrative closure, which may explain why environmental topics are often introduced in isolated episodes rather than as part of a continuous storyline. In procedural or legal dramas like *Extraordinary Attorney Woo* (Lee, 2022), climate-related cases are typically self-contained, resolved within one episode, and rarely revisited.

Regarding distribution, the selected dramas were broadcast on major national networks (e.g., tvN, KBS, JTBC, MBC TV) or released as originals on global streaming platforms such as Netflix, Amazon Prime, and Rakuten Viki. These platforms have contributed to the globalization of K-dramas and increased the

visibility of Korean content with international audiences. However, industrial pressures to appeal to diverse global markets can also shape creative choices, favoring universal, emotionally resonant themes over local or politically charged issues (O'Connor, 2007; UNESCO, 2022). Consequently, while the global reach of K-dramas creates opportunities for climate narratives to gain traction, it may also discourage content creators from foregrounding controversial or policy-driven environmental issues that lack broad international appeal.

Thus, these industrial and creative constraints, genre norms, format limitations, and platform-driven content strategies help explain why climate storytelling in K-dramas often appears as brief, symbolic, or metaphorical rather than as a sustained or systemic narrative focus.

### ***Framing Analysis and Ecocinema***

We started our analysis using keyword matching to identify the scenes that contain references to climate-change terms. While keyword matching provides an initial entry point for identifying climate-related content in K-dramas, framing theory requires a deeper interpretive analysis to understand how narratives shape meaning. Thus, following Entman's (1993) four framing functions, we move beyond surface-level textual presence to examine how frames are embedded in character motivations, plot dynamics, and audiovisual cues. This approach allows us to uncover the nuanced ways in which climate change is constructed, negotiated, or marginalized within serialized storytelling.

Characters' motivations offer critical insights into how climate issues are framed. For instance, in *Forecasting Love and Weather* (Pyo, 2022), Chae Yoo Jin, a weather reporter, attempts to raise awareness about global warming, but is dismissed by her editor, who prioritizes commercial interests. This moment conveys both a problem definition (Entman, 1993), the suppression of environmental discourse in favor of profit, and a moral evaluation, contrasting ethical journalism with commercial pragmatism.

This scene reveals a frame of institutional resistance and commodification of environmental narratives, contrasting individual moral urgency with systemic inertia. Such character-driven moments illustrate how framing operates through narrative tension and competing value systems.

In addition, plot developments also serve as framing devices by highlighting what is considered problematic and how it is resolved. In *Extraordinary Attorney Woo* (Yu, 2022), the central conflict revolves around an environmental lawsuit tied to a delayed impact assessment. The narrative emphasizes procedural loopholes and bureaucratic negligence. This is a clear example of Entman's (1993) causal interpretation frame, where responsibility for environmental harm is attributed to systemic and institutional shortcomings.

Visual and auditory elements play a crucial role in ecocinema and framing climate narratives. Settings such as polluted landscapes, flooded streets, or survivalist apartments visually reinforce frames of ecological crisis, vulnerability, or resilience. For example, in *Happiness* (Hong, 2021), Kim Se Hun's hazmat suit and stockpiled rations frame climate anxiety as both rational and marginal, presenting a dual lens of foresight and paranoia. This presents a layered moral evaluation (Entman, 1993), where the visual framing questions whether environmental concern is justified or mocked. Similarly, scenes involving recycling or

eco-friendly design choices, often depicted with bright lighting and soft background music, frame sustainability as normative and desirable.

We unpack broader themes such as institutional responsibility, media complicity, and personal empowerment by identifying frames through character behavior, plot resolution, and visual composition, including settings, props, costumes, and cinematographic choices. These elements collectively reinforce problem definition (Entman, 1993) by showing how central or invisible climate concerns are made in K-dramas.

This multidimensional ecocinema and framing analysis reveals how K-dramas position climate change around national identity, generational values, and societal ethics. Ultimately, it enables us to map the discursive terrain in which environmental issues are made visible, or rendered invisible, within popular culture.

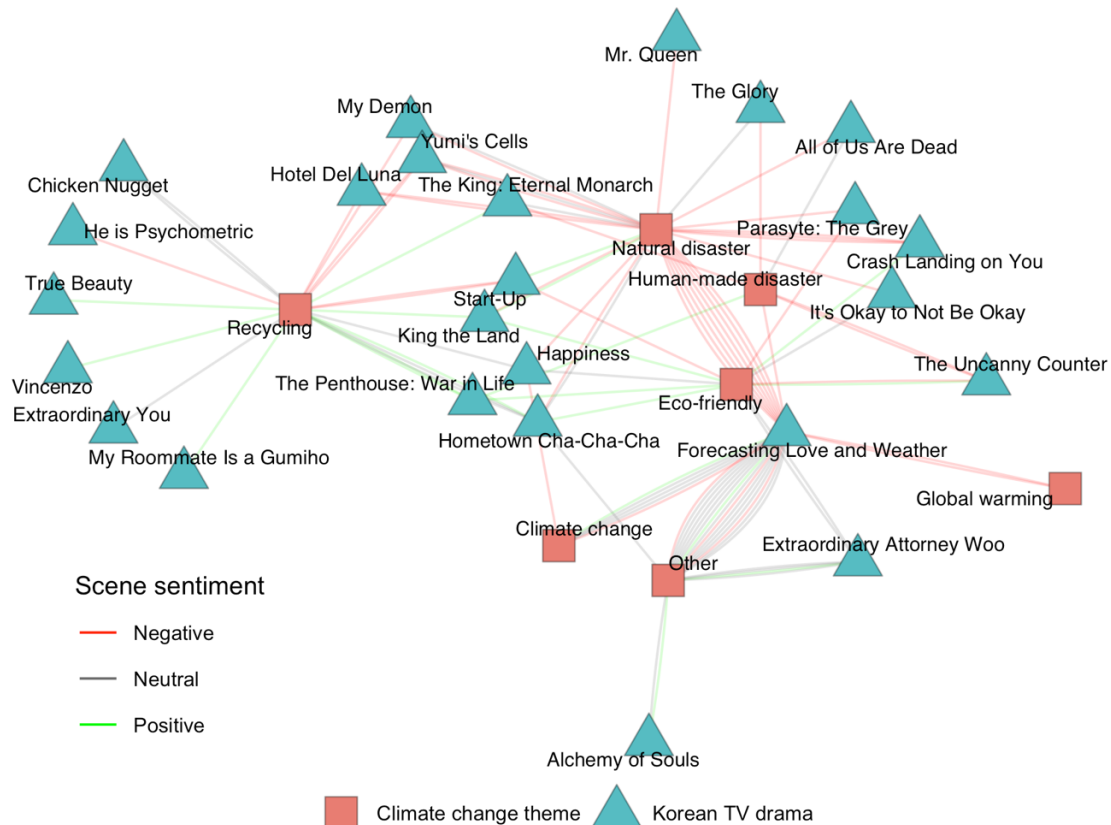
Complementing the framing analysis, an ecocinema perspective draws attention to the aesthetic and ethical dimensions of how nature, climate, and ecological crisis are visually and narratively constructed in K-dramas. Ecocinema examines what is represented and how it is shown through scene design, pacing, silence, atmosphere, and symbolic imagery (Ingramd, 2012; MacDonald, 2012). For instance, *Forecasting Love and Weather* (Pyo, 2022) repeatedly situates its characters within institutional spaces like the KMA, highlighting technocratic responses to nature rather than immersive encounters with it. In contrast, *Extraordinary Attorney Woo* (Lee, 2022) features contemplative temple scenes surrounded by natural landscapes, invoking a spiritual ecology rooted in reverence and cultural memory. These juxtapositions implicitly convey a moral evaluation (Entman, 1993), contrasting technocratic detachment with ecological reverence.

These differing cinematic choices influence viewers' emotional engagement with environmental issues through anxiety, detachment, irony, or empathy. Notably, scenes depicting recycling or eco-friendly practices are often shot in brightly lit, domestic settings, reinforcing the normalization of sustainability as part of everyday life, whereas climate anxiety in *Happiness* (Hong, 2021), is conveyed through claustrophobic indoor framing and prepper props, emphasizing isolation and precarity. Ecocinema thus enriches our understanding of K-dramas by revealing how environmental meanings are embodied, spatialized, and affectively charged, often conveying more through mood and visual tension than through direct dialogue.

### **Computational Methods: Network and Sentiment Analyses**

Figure 2 illustrates the predominant types of climate change themes in K-dramas from 2019 to 2024, recycling, natural disasters, eco-friendly themes, and human-made disasters, alongside the sentiment associated with each portrayal. Red squares denote the climate change theme, while turquoise triangles denote K-dramas. Each line connecting a drama to a climate change theme represents one scene in which a climate change-related topic is depicted. The sentiment conveyed in these themes is represented by the color of the lines (red for a negative sentiment, green for a positive sentiment, and gray for a neutral sentiment). Recycling scenes featured in 15 K-dramas, including *Vincenzo* (Kim & Jo, 2021), *He Is*

*Psychometric* (Lee & Kim, 2019), *True Beauty* (Jang & Kim, 2020), *Chicken Nugget* (Jang & Kwon, 2024), *Extraordinary You* (Kim, 2019b), *My Demon* (Lee et al., 2023), *Yumi's Cell* (Yang, 2021), and *Start-Up* (Yoo, 2020). Natural disasters were depicted in 15 K-dramas, eco-friendly themes in 10, and human-made disasters in 6 K-dramas.



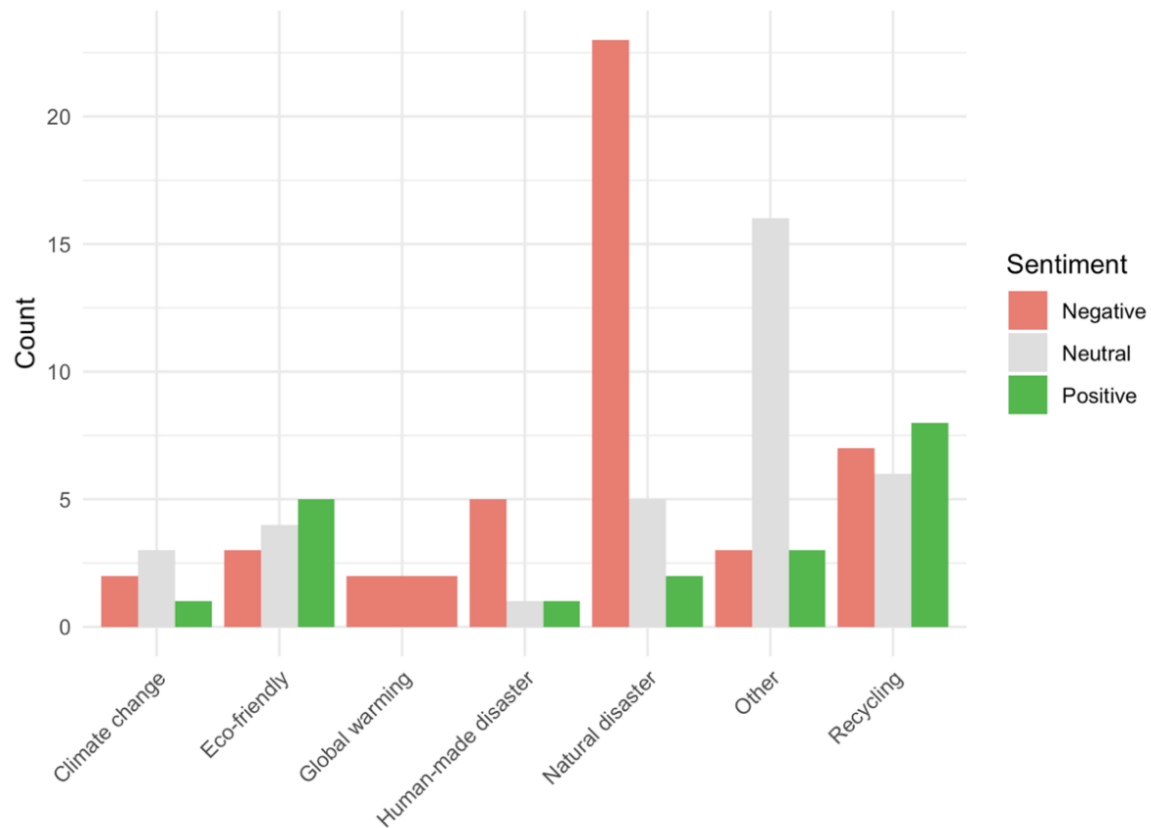
**Figure 2. Network analysis of Korean TV dramas and climate change theme, and sentiment analysis.**

Additionally, Figure 2 shows that the K-drama *Forecasting Love and Weather* (Pyo, 2022) featured climate change scenes predominantly focusing on natural disasters and global warming, with all exhibiting negative sentiments. Other related themes in *Forecasting Love and Weather* showed a mix of positive and negative sentiments. Likewise, *The King: Eternal Monarch* (Choi & Yoon, 2020), *Hotel Del Luna* (Bae, 2019), *Yumi's Cell* (Yang, 2021), and *Crash Landing on You* (Jang, 2019, 2020) emphasized natural disasters, mostly with a negative tone. Recycling, in contrast, was generally portrayed positively.

Figure 3 shows the prevalence of sentiments for each of the seven types of climate change themes. Natural disasters were the most common theme in K-dramas from 2019 to 2024, appearing in over 20 scenes with predominantly negative sentiments. The second most frequent category, "other," included

discussions of the ecosystem, atmosphere, or environment without expressed emotion and featured mostly neutral sentiments.

Recycling scenes generally conveyed a positive sentiment (nine scenes), highlighting characters actively recycling or encouraging others to recycle correctly. However, in seven scenes, recycling scenes reflected frustration or confusion, as the characters either recycled improperly or resisted the activity. Additionally, six recycling scenes were classified as neutral due to a lack of expressed emotion. Finally, the global warming theme in these dramas was always portrayed with a negative sentiment.



**Figure 3. Sentiment and type of climate change theme.**

Thus, out of 60 Korean TV dramas, 35 did not include climate change scenes, and 26 included climate change scenes. *Forecasting Love and Weather* (Pyo, 2022) emerged with the most climate change-related scenes (50), followed by *Extraordinary Attorney Woo* (Lee, 2022) with 16 and *The Uncanny Counter* (Kim & Kim, 2020) with 13. Our approach combines computational methods with ecocinema and framing analysis to offer a novel perspective on climate change representations in popular media.

### Conclusions

The increasing global popularity of K-dramas has created a vital means of integrating climate change discussions into mainstream media. Our findings demonstrate that climate change and related themes were scarcely discussed in the 60 internationally popular K-dramas of the past five years. Altogether, only four of the 1,135 hours of these dramas contained any reference to climate change, accounting for 0.36% of their total runtime. This trend was not on a rising trajectory. Notably, *Squid Game* (Hwang & Kim, 2021)—an immensely popular drama with over 2.8 billion hours of global viewership—was among 34 of the 60 dramas analyzed in this study that did not include climate change themes in their storylines.

It is somewhat surprising that the Korean TV industry has not leveraged the potential of TV dramas with climate-related themes, characters, and sentiments, such as climate anxiety, given that Korean drama makers (e.g., scriptwriters, producers, actors) are particularly inventive in creating nuanced narratives that resonate globally. Moreover, recent studies have shown a demand from audiences for climate change-focused TV dramas (Giaccardi et al., 2022; Schneider-Mayerson et al., 2024).

Recent surveys indicate a major public concern regarding climate change in South Korea. For instance, a 2024 poll revealed that approximately 90% of South Koreans perceive climate change as a pressing crisis affecting their daily lives (Jung-joo, 2024; Min-ho, 2024). Such widespread awareness and concern suggest a growing audience interest in media content addressing environmental issues, compelling content creators to explore climate-related themes.

The South Korean government has actively promoted eco-friendly practices within the content industry. The Korea Creative Content Agency, under the Ministry of Culture, Sports and Tourism, has implemented initiatives like the ECO ACTION project, which offers guidelines for sustainable content production and tools such as a carbon calculator to measure and reduce emissions during production processes (Lee, 2024). Such policies not only facilitate environmentally conscious production but also signal institutional support for climate-themed content, encouraging creators to align their projects with national sustainability goals.

Climate-themed Korean media has demonstrated both domestic and international appeal. For example, the K-drama *Forecasting Love and Weather* (Pyo, 2022), intertwining romantic narratives and meteorological themes, achieved notable success by featuring in Netflix's Global Top 10 for six consecutive weeks (Sarkar, 2022). This success underscores the market viability of content that integrates climate-related topics, indicating a favorable reception from a broad audience base.

Our study advances the ecocinema and framing theory by integrating computational methods (network analysis and sentiment analysis) and a multimodal analysis, offering a more nuanced understanding of how frames and their emotional tones influence audience perceptions. By applying the ecocinema and framing theory to visual and multimodal contexts, the research demonstrates how text, images, and audio collectively construct frames, particularly in less explored media forms like K-dramas, while the longitudinal approach showcases framing trends over time. These methodological choices bridge qualitative and quantitative methodologies, enhancing the precision and scalability of ecocinema and

framing analysis, and broadening their applicability to fictional narratives and complex global issues like climate change.

This study makes three significant contributions. First, theoretically, it advances ecocinema and framing theory analysis by applying it to TV dramas while incorporating computational approaches alongside qualitative methods. Within the field of ecocinema, this study expands the narrative by exploring how visual storytelling in TV dramas shapes ecological consciousness, illustrating the potential of entertainment media to foster environmental engagement and advocacy. Second, empirically, it is the first comprehensive investigation of climate change themes in K-dramas, addressing a critical gap in understanding how media influences public awareness of environmental issues. Third, methodologically, it presents a framework that combines computational techniques and longitudinal analysis, providing a replicable model for examining media content. Beyond enhancing research on Hallyu and climate communication, this work enriches the broader narratives on fiction's capacity to address global challenges like climate change.

Integrating ecocinema into Hallyu studies is essential for three reasons. First, it broadens the thematic scope of Hallyu research, which traditionally focuses on family, history, gender, and class, while environmental themes remain underexplored. As cultural soft power, K-dramas can also serve as platforms for ecological narratives. Second, given their global reach (e.g., *Squid Game*, Hwang & Kim, 2021), K-dramas offer an effective medium for climate change awareness, filling the gap in environmental storytelling within serialized TV formats. Third, it addresses the imbalance in ecocinema studies, which predominantly focus on Western media, by highlighting ecological narratives in East Asian mainstream television as well as with global audiences.

This study has some limitations. It focuses exclusively on Korean TV dramas produced between 2019 and 2024, limiting the ability to identify long-term trends or conduct comparisons with earlier portrayals of climate issues. While we analyzed English-language subtitles, essential Korean terms or contextual nuances may have yet to be fully captured. Moreover, the selection was based on 10 globally popular K-dramas on platforms such as IMDb, MyDramaList, Netflix, Rakuten Viki, Ranker, and Amazon Prime, potentially overlooking narratives from domestically focused dramas.

Future research could explore other platforms, examine domestically oriented content, and investigate why climate change remains underrepresented in K-dramas despite South Korea's significant environmental challenges. This includes studying the roles of scriptwriters, producers, and production companies in shaping climate narratives and exploring whether such choices are driven by commercial priorities, deliberate intent, or other rationales. Further studies could also adopt the computational methods proposed here to analyze climate change storytelling about themes like health or conduct comparative analyses of climate or health depictions across countries. Additionally, future research could examine how in different cultural contexts ecocinema is used to address environmental issues and explore how cultural narratives and cinematic techniques influence public perceptions of climate change. Future studies could also focus on analyzing the role of ecocinema in global TV and film festivals, examining how such platforms promote environmental awareness and which cinematic strategies are most effective in reaching international audiences.

Finally, this study advocates for reimagining climate change storytelling in South Korean contexts, emphasizing the need to move beyond Western-dominated narratives. By examining climate change themes in K-dramas—a medium with significant global influence, we highlight how environmental issues are portrayed and their potential to inspire imaginative responses to the climate crisis.

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