

Article

Creating Environmental and Climate Change Consciousness in Nigeria Using Artworks as Visual Metaphors

Trevor Vermont Morgan

Department of Fine and Applied Arts, University of Nigeria, Nsukka; morgan.trevor@unn.edu.ng; orcid.org/0000-0002-0695-1531

Abstract

This paper speaks on certain environmental problems in Nigeria and the interest here is on eco-aesthetics and the communication of environmental issues. Although eco-problems have become globally endemic, the inclination of many Nigerians has predisposed them to negative environmental conditions. It is this understanding that prompted my thinking of the problem of the environment from a visual standpoint. The increasing scientific discourse around the ecological problem has left non-scientific studies emerging from behind. Yet artistic actions are burgeoning. Visual and creative methods could be properly leveraged for adaptive and mitigatory directions, considering the rise of the image culture of this time. In this paper, I have engaged with my artistic practice as a way to provide understanding and discourse around selected ecological issues. Using my motivated artworks as visual data, this study explores three major themes: the generic concept of climate change, emissions, and waste mismanagement informed largely by Nigeria's throwaway culture. This practice-led process of artistic exploration follows a qualitative paradigm of study. The visual data and their themes stand as visual metaphors and are so analysed using conceptual metaphor theory expounded by Lakoff and Johnson, Andrew Ortony, and Charles Forceville. The study provides understanding, redirects the sensibilities of the audience, and adduces positive responses to eco-publicising.

Keywords: *Climate change, environmental problems, visual art, visual and conceptual metaphor, Nigeria and Africa*

Introduction

The problems of ecology have been largely anthropogenic and have been variously given an important place in United Nation's SDGs goals. United Nation's SDGs scope and goals deal with 'sustainable cities and communities,' 'climate action,' 'life below water,' and 'life on land.' While my study draws and reflects the narrative from a Nigerian perspective, it expresses concern with ecological problems in general. Recently a major politician campaigning for the country's presidential election was asked his take on the problem of climate change, his response to the question suggested a kind of poor understanding of the matter. He maintained that if the West refuses to support the nation in the fight against climate/environmental problems then, the nation would as well be indifferent (Oluwasanjo, 2022).

It is then deducible how the problem of the environment has much depended on attitude and understanding, especially, of many African people. I am aware of the several formalist commitments to the ecological problems in Nigeria, with a lack of proper understanding among the masses which cannot be overemphasized. For Nigeria, beyond the notorious activities of gas-flaring, and unguided oil spillage, among others, the public is also involved in activities that engender environmental decadence such as deforestation, improper waste management, burnings, and emissions. So, like in other developing nations, many Nigerian masses are yet to gain sufficient consciousness that guide their fundamental environmental sanity and sensibility (Oyeniyi, 2011; Morgan, 2018a) toward a possible green economy. At the basic level, such insufficient understanding is manifest in polluted



environments which has the potential to cause mental and psychological unhealthiness, disease spread, as well as contribute to global warming. It is therefore relevant to rethink ways of addressing the masses at their level regarding issues of ecological distress.

Following my practice-based artist process, this study explores a discourse built upon visual metaphors that could advance mass consciousness around the problem of climate change and the environment. I explore these by interpreting my works which have emerged under selected themes. This is to provide an understanding of environmental problems facing Nigeria, Africa, and the world at large with their related socio-health issues. Visual metaphor is an association with, representation of, or allusion to specific ideas using images or artworks.

Critical Insights and Review

Creating visual metaphors is one of the ways of interrogating social, cultural, or political issues in art. Undoubtedly, visual expressions advance meaning-making. Artists have been known to explore art and meaning beyond the realms of realism. For instance, in discussing the place of contemporary art in the environmental crisis, Douglas (2021) identified the use of absurdity as one of the ways of reimagining issues of our everyday life. She describes this as “creating strange if not bizarre juxtapositions” (p.1). According to Douglas while a work of absurdity is not basically those of irony or metaphor, it thrives on ‘using nonsense to vaccinate nonsense’. In creating such absurd works, the nonsense of the art world could create tension upon that of the real world thereby provoking deep thoughts and reflections in the audience. This is not necessarily the art of activism. Yet, several art activism, movements or actions around ecological problems have been carried out in the past to bolster the fight for ecological change. Examples include the *Green Patriot Posters* campaign (Cozen, 2013); #climatestrike global campaign (Laville & Watts, 2019), Extinction Rebellion (Otte, 2019), among others. Yet, more such efforts are needed in places where the consciousness or attention to the issue of the environment is low (Morgan, 2018b).

I am aware that some humanistic voices are calling for varied and innovative approaches to the problems of ecology considering the apocalyptic tendencies that threaten the globe in climate and environmental change. For instance, the flooding that occurred in Nigeria in the recent year was a disaster acclaimed to result from climate change. Some over one million persons were displaced; about 600 died and about two hundred thousand houses were destroyed (Khalid & Maishman, 2022). On this subject, Okri (2021, para. 1) demanded that “the response to our most urgent threat requires new forms of creativity and human imagination.” By this, he calls on humanists, artists, and researchers to do more to intervene on the issue of the environment with innovative approaches. So there is a need for a more creative and engaging approach to understanding climate change than by sheer theoretical transmission of the notion (Bentz, 2020).

The call on artists and researchers in the humanities for more participation according to Douglas (2021, p. 2) is to “offer new representations that would help us to metabolize the terror of environmental devastation.” This is substantiated in the

work, 'Critical Zones: The Science and Politics of Landing on Earth (Parikka, 2021; Latour, 2020). This is not to say that those in the arts have remained unconcerned about the ecological issues of this time. Morgan (2022) identified some artists involved in the critical interventions of environmental issues around them. Klöckner and Sommer (2021) in their work 'Visual art inspired by climate change...' explored the various artworks presented during the 21st UN climate summit in Paris together with the audience's reaction. They underscored the paramountcy of the role artists play alongside scientists. Their study underpinned the diverse perceptions of global environmental change in the works of artists and more especially the ways that the audience perceive and react to such works. In other words this deals with the psychological and emotional outcomes of artworks on viewers.

Regarding the art exhibition held during the UN Climate Summit, it is important to note how metaphor became one of the categorising features of the 37 artworks presented during the 21st UN climate summit in Paris as identified by Klöckner and Sommer (2021). This shows how beyond realism, visual tropes and motivated signs can be engaged in creating meaning visually around abstract concepts. There is a sense of the possibility that metaphors can be artistically tooled to provide "elaborations, extensions, and alternatives on basic structural elements" (Cozen 2013, p. 297) Lara-Garcia and Lara-Rosana (1999) underscore such use of metaphor as a means of reifying and representing complex knowledge. It is this characteristic of metaphor to espouse the interpretation of complex ideas that I explore in this study.

Although Klöckner and Sommer (2021) seem to question the participatory direction of the artworks presented during the 21st UN climate summit, they still acknowledge the potential of the works to produce decisions and behaviour change in the viewers through emotions and impressions on viewers. Creating awareness of such phenomena as ecological sustainability is pertinent in "improving knowledge of the environmental consequences of one's actions" and the role of art in doing so is highly potent (Curtis, Reid, & Reeve 2014, p. 3). This behaviour change is necessary since the ecological impact is largely an accumulated product of human activities.

Methodology of Practice

This study uses the methodological approach of a studio-based visual art exploration. As a qualitative study, I have engaged creative practice-led approach as a way to explore new grounds of knowledge production. A visual art practice centralises its focus on the production of works as the basis for contributing to knowledge (Candy, 2006; Candy & Edmonds, 2018). My studio practice has followed the key aspects of the methodological process as posited by Gray and Malins (2004) and Sullivan (2010). Beginning with researching the problem to have a proper grip on it, the process moves to the ideational stage where the artist makes his sketches and journaling as a way to build up his creative direction. Yet it is important to note that creative explorations are not rigid, as sometimes beyond original intentions the artist can break new grounds. Borgdorf (2012, p. 121) thinks

of the studio art process as a “practice of making and playing.” The idea of making and playing refers to the sense in which the entire process is not regimental.

At the ideating stage, the artist works with certain reflexivity which is common in several studio works (Hannula, Suoranta, & Vaden 2014). Reflection involves rigorous and critical thinking about the subject to conceive the most potent idea for the piece. Moreover, during reflection and pursuit of originality, reflexivity comes in. Reflexivity works by the introduction of the producer’s previous experiences and espousing that in his working process (D’Cruz, Gillingham, & Melendez, 2007). In this way, the study achieves a level of subjectivity for which qualitative research is known. Throughout the process of artmaking, reflection is expressed by making and breaking until the desired result is realized. So the exploration provides knowledge through the artifacts created and knowledge is generated and expressed in discourse (Morgan, 2022).

The epistemological mode of artistic research in this study provides insight and comprehension of the process of my work. The knowledge here is propositional and explicit, as a statement to reify thematic issues of ecological problems in Nigeria (Borgdorf, 2012). Borgdorf in his reference holds that “thoughts and concepts assemble around art in such a way that the artworks themselves begin to speak” (p. 122). It is through the emerging artworks that I probe the thought and discourse around environmental issues. Here, the works I have created are interpreted considering them as visual metaphors whose meanings are not superficially explicit.

On sources of data used for this study, artworks were created and the general approach used included taking photographs from the environment, and two, motivating them into desirable forms using relevant digital tools. Most of the works developed from local objects and they are socially and mutually recognizable forms. In using a photo-editing application (in this case, Adobe Photoshop®) several digital and creative simulations were explored. The creative process includes cropping and montaging, superimpositions, colour effects, brightness, and contrast, among others. In all, the resulting visual works stand as metaphors for the select aspects of environmental problems in Nigeria. The rationale for creating artworks as visual metaphors is to reify concepts that would hardly be visualised or understood literally and to represent complex knowledge (Lara-Garcia & Lara-Rosana, 1999). On the other hand, Arnheim (1969, p. 112), highlights a major reason behind an artist’s use of metaphor in practice: “Some visualizations of theoretical concepts can be described as routine metaphors.”

Furthermore, deep thought (reflectivity) and self-directed espousal in practice (reflexivity) are important characteristics in practice-based qualitative research (Du Plooy-Cilliers, 2014). The artist must reflect and tap from previous experiences to arrive at his or her visualisation. Such previous experiences may lead to a certain level of appropriation as the sensibility of the artist is raised over past creative encounters. The work would first make sense to the artist before it does to the audience. Although there may be some element of subjectivity in this, the artist does not seek to provide facts about a phenomenon rather, he or she explores ideas and curiosities to catalyse them visually while allowing viewers to make sense of

the art (Hannula, Suoranta, & Vaden, 2014; Klöckner & Sommer, 2021). The artist is more concerned with the issue of translating ideas into visual forms as providing a ground for the construction of meaning.

Analytical Framework and Conceptual Metaphor Theory (CMT)

Moreover, while the use of metaphors may be occasioned by the need to handle theoretical concepts, using metaphors could also be a common personal approach. We live and communicate with various metaphors and they are mainly expressed in language and signs (Lakoff & Johnson, 1980). Forceville and Urios-Aparisi (2009) underscore that a metaphor is not necessarily a figure of speech but a figure of thought. This suggests that it is not merely about language but about the formation of thoughts and ideas before they are represented in various languages and semiotic forms. The theory of Conceptual Metaphor holds that in many ways meanings and expressions are aptly framed in nonliteral language or representation (Vicente, 2020). Accordingly, this theoretical framework as a matter of conventionality could make use of socially recognized or unusual correspondences to link the representation and the thought domains. These two domains are referred to as the source and the target domains (Forceville, 2009). They include the mental or abstract conception and the perceptible or visible rendering of a concept.

Conceptual Metaphor theory “puts great emphasis on metaphor’s role in conceptualizing the abstract in terms of the concrete” (Forceville 2009, p. 27). Since metaphors are usually constructed on related imageries, there is a correspondence between the source and the target. In artistic or non-verbal expressions, the idea that requires explanation, that is, the target domain, is expressed in terms of the visual or comprehensible form, which is the (tangible) source domain (Forceville & Paling, 2021). In this way, the source domain provides an understanding of the target domain. This clarifies the idea of transiting between realms in order to produce an embodiment of the targeted abstract thought. This understanding cannot be less true when an artist is composing his or her ideas to be rendered in visual terms as a means of interpretation and meaning making (Arnheim 1969, Drake et al, 2021). In a bid to actualize a concrete and explanatory form (source domain) of the abstract concept (target domain), metaphors can be used with other visual tropes such as personification and metonyms. Personification amounts to giving life features to inanimate subjects in visuals while in metonyms, a related part of the subject is visualized to explain the target domain.

It is, therefore, imperative to consider the cognitive ambiance that comes into function in creating images from the abstract realm of the human mind to the realm of reality. Yet, there need for a trade-off between creativity and clarity, especially when dealing with eco-publicising (Trollet, Barbier, & Jacquet, 2019). The work of Arnheim (1969) on visual thinking is very essential for understanding how the complex idea of climate and environmental change can be translated into visual forms, which can manifest as metaphors and abstractions. Abstraction deals with the ability to envision the “unseen, underlying, and essential structure” of a complex concept (Drake et al. 2021, p. 4). Arnheim insists that “images contain thought... visual arts are a home ground of visual thinking (1969, p. 254). In trying to express and vividly render the mental imageries of the target concept the artist

tries different image activation and manipulation approaches. For this study, I deal with my works which have emerged as visual metaphors or abstractions as the closest expression of the ecological issue.

As an important point of this study, the idea of environmental and climate change is in the target conceptual domain, which is the immaterial form, while the artworks are in the source domain. Typically, the artist thinks of representative forms that can convey his ideas more potently, and as such there is a certain kind of conjuration that goes on in the mind in an attempt to reify complex and 'difficult' notions. As the artist is faced with the task of crystalizing and visualizing abstract realities, critical reflection comes into play (Aniakor, 1987). In such a case, the artist contemplates and conjures imageries mentally (activation and simulation) and composes them visually as metaphors. Further creative manipulations are done as the work emerges (Drake et al, 2021). In addition, it is important to underscore how reflexivity often plays significant roles in the conjuration and creation of art from the mental domain. Conceptual metaphor as I apply it in this study, is a way of giving body and form to the abstract voices and views of climate and environmental problems.

Description and Discourse: A Visual Analysis

The visual analysis aims to advance the consciousness and understanding among Nigerian and African populations whose environmental culture for adaptation and mitigation is still low (Morgan, 2018a). As a simple approach to the analysis, I identify themes around ecological problems as source domains while linking them with visual works that function in the target domain. Thus, the visual metaphors encoded in the artworks are expressed. Additionally, other key features of the artwork such as colour and forms are highlighted. I discuss four artworks, which are products of my creative exploration. Their titles signify the environmental subjects they address.

The need to continue to learn about climate change and environmental ethics cannot be overemphasised. The notion of ecological change seems illusive to several aspects of the public, even to uneducated persons. In a sense, the concept still resides in the target domain, which is more of a theoretical concept. The emerging works espoused in this study are meant to give a visual body or source domain to the target concepts of different ecological problems as a way of providing interpretation and understanding of this pervasive phenomenon. Using four artworks visually semiotized, I briefly explore below three major themes of study which include the generic concept of climate change, the problem of emission and burnings, as well waste mismanagement informed by Nigeria's throwaway culture.

Crystallising Eco-cancer

Eco-cancer (Fig. 1) or what looks like a 'map of climate change' is a work through which I have attempted to crystalise wholesale the idea of climate change as a cancerous disease. As a health or biological metaphor it draws an association between the human body and the earth's body. Cancer as a health condition is signalled by a malignant growth or tumor, eating up body cells and destroying healthy tissues. In the same way, the problem of the earth's environment has

continued to eat in noticeably since the 18th century (Morgan, 2022) in different forms and shades just as cancerous growth takes on different aspects of the human body. One cannot undermine the fact that the increase in the amount of ultraviolet (UV) radiation reaching the earth's surface as a result of the gradual depletion of the ozone layer predisposes humans to the possibility of skin cancer and genetic damage, among other health hazards (Wuebbles, 2022). The global problem as a worsening ailment defies cures and allows for management, adaptation, and mitigation while a possible ultimate apocalyptic disaster tarry (Okri, 2021). *Eco-cancer* is a source domain for the climate change concept.

In its visualisation this piece shows a patina of different chromatic layers that represent the most influential greenhouse gases associated with global warming such as carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). The chromatic shades of the piece reveal the chemical reactivity caused by these gases and in turn, signify the corrosive consequences on the earth's environment. For instance, the visible effects of greenhouse gases in causing acid rain are known in parts of Nigeria. Aquatic and human lives are adversely affected by acid rain (Efe & Mogborukor 2012; Nduka et al, 2008). *Eco-cancer* also connotes the wearing and eating away of the earth's surface as well as the subtle subdivision into smaller islands by floods and erosions.

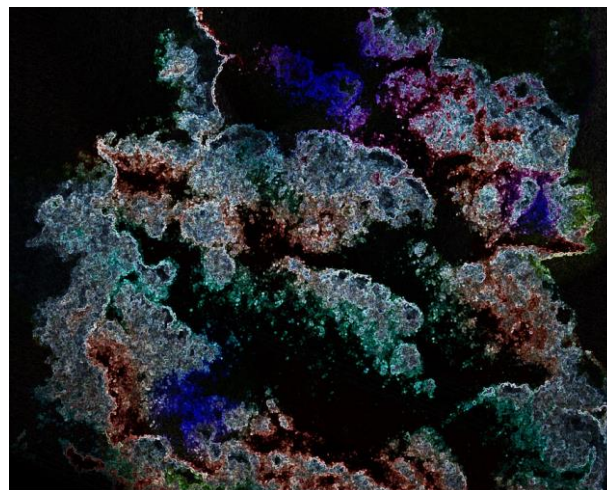


Fig. 1: *Eco-cancer*

Apocalypitics and increasing global temperature

The effect of global warming which manifests in temperature increase seems to be more noticeable evidence of climate change for many people than other manifestations of the ecological problem. The average global temperature of the earth's surface has continued to increase owing to the increasing presence of carbon dioxide (CO₂) in the atmosphere (Milman et al, 2021). The concept of temperature is invisible and abstract and the closest mode of visualisation must be related to activities that produce heat, which is an indexical semiotic sign. *Apocalypitics* (Fig 2.) is a semiotically motivated image, an indexical sign that was created digitally to provide a chemical affordance towards expressing the potential danger and existential possibility of the cataclysm that faces humanity.

In my creative practice, a photographic image of a firestorm was copied in duplicate layers and differently adjusted in Photoshop for *Filter* → *Distortion* → *Wave effects*. A hybrid image emerged when the *Lens Flare* filter was also added on a black background superimposed above the first two layers earlier created. By adding a smoke effect with a brush tool in the Photoshop application an impression of a smouldering scene was created above the 'cityscape'.

Descriptively, *Apocalyptic*s represents a scene where assorted galactic forms and objects are boiling, smouldering, or falling apart representative of increasing temperature. It is a motivated indexical sign pointing to the 'combustive' effects of the climate problem, as it were. I am aware that the goal is not necessarily motivated by fear as critiqued by (Moser & Dilling, 2011) but to give the most approximate rendering Africans in the tropics can associate with as relevant, comprehensible visual statement is essential in eco-publishing (Trollet, Barbier, & Jacquet, 2019). Visually, the objects and forms in Fig. 2 show the symbolic collapse of the 'pillars that hold the earth's space' and the cataclysmic possibility of climate change. One would not forget the link that exists between increased global temperature, drought, and mega-fire incidences in different parts of the world which in recent years are known for colossal destruction such as the death of humans, animals, and plants as well as destroying homes and businesses (BBC 2020; Clarke et al, 2022).

Concerning Nigeria as a major oil producer in Africa, one cannot extricate the incidence of dangerous emissions that arise from related activities of oil exploration. Nigeria's notorious gas flaring is a good example of an emission practice that releases greenhouse gasses into the Earth's atmosphere resulting in global warming (Omontuemhen et al, 2018). The practice of cooking with firewood known in Nigeria also causes carbon emissions. Since Nigeria has yet to develop a sound approach to a green economy, emissions from automobiles have remained a huge environmental issue in many of its cities (Morgan, 2018a). I am aware that on the whole, developed nations are contributing more to global emissions than Africa as a result of urbanisation and industrialisation. While burnings do not directly increase global temperature, increasing greenhouse gases blanket the earth and trap the sun's heat thereby leading to global warming.

*Apocalyptic*s (Fig. 2) is designed to be a source domain through which the target concept of an increase in global temperature would be known. In considering this image, one would observe that while the 'actual flame' representing global warming has not dropped on the cityscape, people could feel less concerned. There is a metaphorical association between the earth's increasing temperatures and a possible eschatological apocalypse as shown in *Apocalyptic*s. The conceptual metaphor for the earth's increased global temperature and warming is also evident in the chromatic scheme of this motivated piece, yellow, red, and black.



Fig. 2: *Apocalypitics*

In Defence of Waste

Environmental degradation caused by the littering of modern-day packaging materials such as cellophane, plastics, and others, has been defined as “mental pollution of consumerism” by Miles (2016, p. 3). My concern about Nigeria's environmental degradation informed the exploration of the works, *‘Vomitus Escapade’* (Fig. 3) and *‘In Defence of Waste’* (Fig. 4). The former is a visual metaphor that depends on how nature ‘throws up’, ‘throws out’ and entangles humanity with the non-biodegradable materials it swallows. The earth, as it were, in the piece, observably, opens its mouth and pours out filth and ordure upon its inhabitants. This design expresses the several natural outcomes of long years of human encounter with the earth. Such outcomes may include landslides, earthquakes, and ocean overflows, all of which could result from protracted human activities.

Incidentally, many African and developing countries are known for their inability to contain or tame nature's wildness and so, many are living with waste, in slums, and other degraded spaces. The attempt to express thought around the target domain of human mismanagement of nature and its effects led to *In Defence of Waste’* (Fig. 4). In trying to assert a local understanding that ‘an evil forest is still a human creation’, this piece signals a situation where untamed nature is ready to overshadow and to consume an indifferent population. With a high degree of certainty scientists agree that “humans are the major cause of global warming since the 1950s” (Black 2013, n.p.). It then directs understanding to the fact that climate and environmental problems are largely about human's inability to handle nature. Such human incapacity leads to a fall capable of ‘crushing’ the earth's population through diseases, increased temperature, flooding, and food scarcity, among others



Fig. 3: *Vomit Escapade*

Fig. 4: *In Defence of Waste*

In a creative apprehension, therefore, I semiotized '*In Defence of Waste*'. The title of this piece is ideologically ironical giving the notion of 'defending', protecting, keeping, and properly accommodating wastes of various kinds so they do not 'fight' human existence. Fighting human existence means an outbreak of disaster or what may ultimately become apocalyptic as suggested by Okri (2021). This idea of defending wastes opposes the common practice of indiscriminately discarding and littering wastes to pollute the human environment. Such defending approaches as I reflect through this piece include recycling, upcycling, use in manuring, and creative practices for which many artists are known (Morgan, 2022; Onuzulike & Obodo, 2012; Obodo & Morgan, 2014).

Conclusion

In this study, I have attempted to advance environmental and climate change consciousness and communication using visually motivated works of art. These images are mainly photographs that were digitally altered to provide the visuals required for eco-publicising. The creative explorations provided a ground for discourse and a means of interpretation moving across domains of meaning-making found in the conceptual metaphor framework. The works I engaged with as visual data stood as source domain concepts providing inroad to the abstract notions of the ecological problems. Many concepts of ecological issues are in the abstract (target) domain and so require interpretation. The works discussed could be used in eco-crusade for promoting understanding, mitigation, or adaptation.

Moreover, in many ways, to achieve ecological sustainability, behaviour change is unavoidably vital and this requires strategic options which in this case is visual. Behaviour change is necessary since the ecological impact is largely anthropogenic and I have shown that awareness through art and visual instantiations are pertinent ways to bestir decisions and actions in audience and viewers (Curtis, Reid, & Reeve, 2014). So the place of art in dealing with ecological issues cannot be overemphasised

(Morgan, 2022) and the use of visual metaphors will help not to disparage artistic interpretations.

References

- Aniakor, Chike C. 1987. Introduction to 2nd Annual Exhibition Catalogue. In *AKA Circle of Exhibiting Artists*, edited by Enugu Hotel Presidential, 23 April–May 25 1987 and Lagos National Gallery of Crafts and Design, 2 July–16 July 1987. Enugu and Lagos.
- Arnheim, Rudolf. 1969. *Visual thinking*. Berkeley: University of California Press.
- BBC. 2020. "Australia fires: A visual guide to the bushfire crisis." *BBA*, Australia. Accessed January 9, 2023. <https://www.bbc.com/news/world-australia-50951043>.
- Bentz, Julia. 2020. "Learning about climate change in, with and through art." *Climatic Change* 162 (3):1595-1612. doi: 10.1007/s10584-020-02804-4.
- Black, Richard. 2013. "A brief history of climate change." *BBC*. Accessed January 7, 2023. <https://www.bbc.com/news/science-environment-15874560>.
- Borgdorf, Henk. 2012. *The Conflict of the Faculties: Perspectives on Artistic Research and Academia*. Amsterdam: Leiden University Press.
- Candy, Linda. 2006. Practice Based Research: A Guide. <https://www.creativityandcognition.com/wp-content/uploads/2011/04/PBR-Guide-1.1-2006.pdf>: Creativity and Cognitive Studios.
- Candy, Linda, and Ernest Edmonds. 2018. "Practice-Based Research in the Creative Arts: Foundations and Futures from the Front Line." *Leonardo* 51 (1):63-69. doi: 10.1162/LEON_a_01471.
- Clarke, Hamish, Brett Cirulis, Trent Penman, Owen Price, Matthias M. Boer, and Ross Bradstock. 2022. "The 2019–2020 Australian forest fires are a harbinger of decreased prescribed burning effectiveness under rising extreme conditions." *Scientific Reports* 12 (1):11871. doi: 10.1038/s41598-022-15262-y.
- Cozen, Brian. 2013. "Mobilizing Artists: Green Patriot Posters, Visual Metaphors, and Climate Change Activism." *Environmental Communication* 7 (2):297-314. doi: <http://dx.doi.org/10.1080/17524032.2013.777353>.
- Curtis, David J., Nick Reid, and Ian Reeve. 2014. "Towards ecological sustainability: observations on the role of the arts." *S.A.P.I.E.N.S (Online)* 7 (1):1-15.
- D’Cruz, Heather, Philip Gillingham, and Sebastian Melendez. 2007. "Reflexivity, its Meanings and Relevance for Social Work: A Critical Review of the Literature." *British Journal of Social Work* 37:73–90. doi: 10.1093/bjsw/bcl001.
- Douglas, Anne Elizabeth. 2021. "Giving Absurdity Form: The Place of Contemporary Art in the Environmental Crisis." *Arts* 10 (4):81.
- Drake, Jennifer E., Seymour Simmons, Seth Rouser, Isabella Poloes, and Ellen Winner. 2021. "Artists Excel on Image Activation But Not Image Manipulation Tasks." *Empirical Studies of the Arts* 39 (1):3-16. doi: 10.1177/0276237419868941.

- Du Plooy-Cilliers, Franzél 2014. "Research Paradigms and Traditions." In *Research Matters*, edited by Franzél du Plooy-Cilliers, Corné Davis and Rose-Marié Bezuidenhout, 18-35. Cape Town: Juta and Company Ltd.
- Efe, S. I., and Joseph Mogborukor. 2012. "Acid Rain in Niger Delta Regions: Implications on Water Resources Quality and Crisis." *AFRREV STECH: An International Journal of Science and Technology* 1 (1):17-46.
- Forceville, Charles. 2009. "Non-verbal and multimodal metaphor in a cognitivist framework: Agendas for research." In *Multimodal Metaphor*, edited by Charles J. Forceville and Eduardo Urios-Aparisi, 19-42. Berlin & New York: Mouton de Gruyter.
- Forceville, Charles, and Sissy Paling. 2021. "The metaphorical representation of depression in short, wordless animation films." *Visual Communication* 20 (1):100-120. doi: 10.1177/1470357218797994.
- Forceville, Charles, and Eduardo Urios-Aparisi. 2009. "Introduction." In *Multimodal metaphor*, edited by Charles J. Forceville and Eduardo Urios-Aparisi, 3-17. Berlin-New York: Mouton de Gruyter.
- Gray, Carole, and Julian Malins. 2004. *Visualizing Research: A Guide to the Research Process in Art and Design*. Surrey: Ashgate Publishing Limited.
- Hannula, Mika, Juha Suoranta, and Tere Vaden. 2014. *Artistic Research Methodology: Narrative, Power and the Public*. New York: Peter Lang Publishing.
- Khalid, Ishaq, and Elsa Maishman. 2022. "Nigeria floods: 'Overwhelming' disaster leaves more than 600 people dead." *BBC News*, 16 October. Accessed November 28. <https://www.bbc.com/news/world-africa-63280518>.
- Klößner, Christian Andreas, and Laura K. Sommer. 2021. "Visual art inspired by climate change – An analysis of audience reactions to 37 artworks presented during 21st UN climate summit in Paris." *PLOS ONE* 16 (2):e0247331. doi: 10.1371/journal.pone.0247331.
- Lakoff, George, and Mark Johnson. 1980. *Metaphors we live by*. Chicago: University of Chicago.
- Lara-Garcia, Felipe, and Felipe Lara-Rosana. 1999. "Visual Art and Metaphors in complex knowledge representation." *Semiotica* 125 (1-3):181-186.
- Latour, Bruno, and Peter Weibel, ed. 2020. *Critical Zones: The Science and Politics of Landing on Earth*. Cambridge: MIT Press, Karlsruhe: ZKM Center for Art and Media.
- Laville, Sandra, and Jonathan Watts. 2019. "Across the globe, millions join the biggest climate protest ever." *The Guardian*. Accessed November 23, 2020. <https://www.theguardian.com/environment/2019/sep/21/across-the-globe-millions-join-biggest-climate-protest-ever>.
- Miles, Malcolm. 2016. "Eco-aesthetic dimensions: Herbert Marcuse, ecology and art." *Cogent Arts & Humanities* 3 (1):1160640. doi: 10.1080/23311983.2016.1160640.
- Milman, Oliver, Andrew Witherspoon, Rita Liu, and Alvin Chang. 2021. "The climate disaster is here." *The Guardian*, October 14. <https://www.theguardian.com/environment/ng-interactive/2021/oct/14/climate-change-happening-now-stats-graphs-maps-cop26>.
- Morgan, Trevor Vermont. 2018a. "A creative communication on ecological issues in Nigeria." *Visual Communication* 17 (4):451–460. doi: <https://doi.org/10.1177/147035721879105>.
- Morgan, Trevor Vermont. 2018b. "A creative communication on ecological issues in Nigeria." *Visual Communication*:1–10. doi: /doi.org/10.1177/147035721879105.

- Morgan, Trevor Vermont. 2022. "A Visual Language of Communicating Ecological Issues in Nigeria." *Online Journal of Art and Design* 10 (2):102-114.
- Moser, Susanne, and Lisa Dilling. 2011. "Communicating Climate Change: Closing the Science-Action Gap." *The Oxford Handbook of Climate Change and Society*:161-174. doi: 10.1093/oxfordhb/9780199566600.003.0011.
- Nduka, John, Orish Orisakwe, L. Ezenweke, T. Ezenwa, Nkoli Chendo, and N. Ezeabasili. 2008. "Acid Rain Phenomenon in Niger Delta Region of Nigeria: Economic, Biodiversity, and Public Health Concern." *TheScientificWorldJournal* 8:811-818. doi: 10.1100/tsw.2008.47.
- Obodo, Evaristus, and Trevor Vermont Morgan. 2014. "Visual Metaphor: Ekene Anikpe's Sculptural Essays." *International Journal of Research in Arts and Social Sciences* 7 (2):98-104.
- Okri, Ben. 2021. "Artists Must Confront the Climate Crisis – We Must Write as If These are the Last Days." *The Guardian*, November 12.
<https://www.theguardian.com/commentisfree/2021/nov/12/artists-climate-crisis-write-creativity-imagination>.
- Oluwasanjo, Ahmed. 2022. "I won't solve climate change as president unless funded by Western nations: Tinubu." *Peoples Gazette*. <https://gazettengr.com/i-wont-solve-climate-change-as-president-unless-funded-by-western-nations-tinubu/>.
- Omontuemhen, Pedro, Akinyemi Akingbade, Olubiyi Akinaanu, Bola Adigun, Omomia Omosomi, and Michael Ogunremi. 2018. Assessing the Impact of Gas Flaring on the Nigerian Economy. Online: PricewaterhouseCoopers Limited (PwC).
- Onuzulike, Ozioma, and Evaristus Obodo. 2012. "Environmental and climate change: issues in the works of some Nigerian visual artist." *Journal of Liberal Studies* 15 (1):100-108.
- Otte, Jedidajah. 2019. "Extinction REbellion: 10 arrested at Dover protest." *The Guardian*.
<https://www.theguardian.com/environment/2019/sep/21/extinction-rebellion-protesters-in-dover-could-face-arrest>.
- Oyeniya, B.A. 2011. "Waste management in contemporary Nigeria: The Abuja example. , 2(2.2): 1-18." *International Journal of Politics and Good Governance* 2 (2):1-18.
- Parikka, Jussi. 2021. "Review of the book Critical Zones: The Science and Politics of Landing on Earth ed. by Bruno Latour and Peter Weibel." *Leonardo* 54 (6):696-698.
- Sullivan, Graeme. 2010. *Art practice as research: Inquiry in the visual arts*. Thousand Oaks, CA: SAGE.
- Trollet, Mélodie, Thibaut Barbier, and Julie Jacquet. 2019. "From Awareness to Action: Taking into Consideration the Role of Emotions and Cognition for a Stage Toward a Better Communication of Climate Change." In *Addressing the Challenges in Communicating Climate Change Across Various Audiences*, 47-64. Springer.
- Vicente, Paulo. 2020. "Conceptual Metaphor Theory." In *The SAGE International Encyclopedia of Mass Media and Society*, edited by Debra L. Merskin. Thousand Oaks: SAGE Publications.
- Wuebbles, Donald. 2022. Ozone depletion. In *Encyclopedia Britannica*. Online: Britannica.