

The Art of Resilience



Disclaimer

All images of the artworks in this publication are the property of the respective artists.

On the cover (*clockwise from top left*)

Yky, Shakes p. 12

Justin Wood, March Towards Extinction p. 6

Pitsho Mafofo, Redefining Life p. 2

Adrien Segal, Trends in Water Use p. 19

The Art of Resilience

The World Bank Group, Washington, DC,
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Singapore Expo Center, Singapore,
May 16, 2020–May 24, 2020

artofresilience.art

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Acknowledgments

Contributors

The Art of Resilience was conceived by the Global Facility for Disaster Reduction and Recovery (GFDRR) Labs team and the World Bank Group Art Program. The exhibition features artists selected through a competitive process. Participation was open to any emerging or established artist using his, her, or their art to help build society's resilience to natural hazards. Artworks of any medium were accepted, and artists included any person engaged in creative endeavors.

Project Team

The Project Team was responsible for the management of all curatorial, logistical, and communications related tasks for this exhibition from conception to completion.

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We extend a special thanks to all the artists who contributed their talent and expertise to this exhibition.

Foreword



Over the past decade, the landscape for development has changed considerably. The traditional focus on economic growth has given way to an increasing emphasis on human development. Tremendous geopolitical upheavals have completely changed people's ways of life. Sustainability is the order of the day rather than a special consideration.

Along with these trends, we're all now facing the most defining trend of all: a changing climate. The planet is heating up at a threatening pace. Increasingly frequent and potent storms are adding to uncertainty and vulnerability. And this is all happening as people concentrate into urban centers, often along vulnerable coastlines.

As these changes and risks have accelerated, so have our means to understand and communicate about them. Advances in science and technology are allowing us to capture and analyze more and better data about natural processes and human activity, in turn making it easier to accurately understand our risk.

These data can tell us a lot about disaster risk. They can tell communities what parts of their city are most likely to flood during the next rainy season, whether their schools can withstand an earthquake, and what impact a damaged bridge will have on the local economy. Indeed, insights such as these have transformed our ability to help people build resilience around the world.

But while charts and graphs can depict what happened or is likely to happen, they often lack a critical element—a human element. They don't explain or explore what it's like to live through a disaster, or to be faced with the persistent threat of one. While they may provide information about disrupted economic activity, they can't really tell us about disrupted lives, families, and communities. And at the end of the day, *people* are at the center of development.

The World Bank Group's *Art of Resilience* exhibition shows one way that an age-old human activity—art—can provide invaluable information and perspective about modern challenges. Through art, people can convey their stories, emotions, and experiences to their community and the world.

The pieces presented in this catalog are those selected for display in the *Art of Resilience* exhibition in late 2019. They embody people's feelings about risk and vulnerability, but also much more. Some of the contributing artists sought to motivate action against the threats that inspired their work. Some sought to leave a lasting impression within their communities by involving community members in the creation of their art. And still others showed ways to weave new and old together by integrating science and technology into their creative processes.

I hope that viewers of this artwork will find it as telling and inspiring as I do. If we are to continue to rise to ever-changing development challenges, we need to take care to understand them from every angle. By engaging artists and their communities, we can reach people in a more personal way, and make sure that their stories don't get lost in the numbers.

A handwritten signature in black ink that reads "Julie Dana". The script is fluid and cursive, with the first letters of "Julie" and "Dana" being significantly larger and more stylized than the rest of the letters.

Julie Dana

Practice Manager,
Global Facility for Disaster Reduction and Recovery

Introduction

Overview

The Art of Resilience brings together 15 international artists, technologists, and makers representing Latin America, South and East Asia, the Middle East, Africa, Europe, and the United States. Curated from a global call for entries, *The Art of Resilience* demonstrates how art can unite a range of disciplines—big data, scientific research, and community organizing—to further the understanding and communication of disaster and climate risk. The Art of Resilience aims to showcase how these new synergies can uniquely and directly support societal efforts to build widespread resilience to disasters and climate change.

Organized by the Labs team of the Global Facility for Disaster Reduction and Recovery (GFDRR) and the World Bank Group Art Program, *The Art of Resilience* includes a wide range of the creative arts—from public art installations, data visualization, and analog photography to digital media, sculpture, and painting. This diversity of mediums, from the more traditional to the hyper-contemporary, highlights how art can be layered atop, placed alongside, or embedded within scientific research to communicate the lived experience of climate change and disaster risk.

With its opening at the World Bank Group headquarters in Washington, DC, the exhibition will speak directly to the development community—including over 10,000 members of staff and countless visiting government officials from around the world—as well as members of the general public. Following their exposition in DC, selected works will then travel to Singapore and be showcased at the ArtScience Museum for the 10-year anniversary of the Understanding Risk community in May 2020.

Why Art?

Art is a powerful means to communicate complex ideas, inspire action, question received wisdom, and connect communities. In the 21st century, there is perhaps no more important set of challenges than understanding the impacts of disasters and environmental changes on our communities and societies, particularly in the developing world. As scientific and engineering knowledge about disasters and climate change has increased, so has the understanding that, in the oft-repeated phrase, “there is no such thing as a natural disaster.” In other words, the vulnerabilities that allow

natural events to become disasters are ultimately social in their origin. They stem directly from political, cultural, and economic decisions about where and how human settlements are built, how resources are distributed, and what level of risk we are willing to bear.

By looking at disasters as social challenges as much as environmental ones, linkages to art become clear. Artistic expression has the power to synthesize complex stories and themes in ways that are immediately captivating. Emotions evoked by art can convey deeply felt urgencies and immediate needs.

Disasters have shaped some of the most influential works of art in history. Joseph Mallord William Turner's sunsets and Mary Shelley's *Frankenstein* were both composed in the shadow one of the greatest volcanic eruptions ever recorded, that of Mount Tambora in 1815. *The Great Wave off Kanagawa*, the iconic image from the Edo period created by the 19th-century Japanese artist Hokusai, was inspired by the artist's awareness of tsunami and rogue wave threats. The Great Lisbon Earthquake in 1755 inspired numerous works, including Voltaire's comical skewering of philosophical determinism in *Candide*, several books of philosophy by Kant, and a series of essays by Rousseau in which he raised vital questions about the causes of disasters and the inequities of their impacts.

Today, disaster continues to be a source of inspiration for musicians, painters, novelists, makers, and technologists from every part of the world, but it also raises an additional question: how do we go forward? Expanding their approach, contemporary artists use diverse means to communicate the multifaceted and interconnected effects of disasters and climate change—drawing on new materials and techniques, scientific knowledge of risk, and engagement with their communities.

The Process

To understand how contemporary artists are engaging with the themes of disaster and climate change in their work, the curatorial team put out a global call for entries targeted at artists defined in the broadest sense. For this exhibition, "artist" was defined as a creative maker: photographers, performers, musicians, innovators, technologists, cultural entrepreneurs, data visualizers, and scientists. Submissions in any medium were welcomed.

The global call yielded nearly 450 entries from 139 artists representing 53 countries. A jury consisting of curators, cultural institution directors, and resilience project managers from a range of organizations—the Smithsonian’s Renwick Gallery, the U.S. National Academy of Sciences, the Climate Museum, the World Bank Group Art Program, and the GFDRR Labs—evaluated all the pieces. Artists were judged on their creativity, conceptual engagement with the theme of resilience, artistic skill, and craftsmanship. Ultimately, 21 pieces from 15 artists were selected for the exhibition.

The Artwork

The selected artworks represent an incredible diversity of mediums, geographies, and artistic visions. The artists come from every corner of the globe. Their work includes custom-made predictive software, three-dimensional sculptures made from hurricane debris or recycled computer keys, abstract oil paintings on sheet metal, hand-drawn topographic maps, and large-scale public interactive installations, to name a few. The collection reveals a number of ways in which art can support societal efforts to build resilience, including serving as a call to action, collaborating with science to foster innovation and understanding of risk, and engaging with communities to meet the challenge of building resilience.

Art as a Call to Action

Art can captivate attention, and raise awareness; it can inform and motivate the public about the natural world and its changes. It is often used to educate people on the importance of building resilience to disasters. It can also motivate by stressing the urgency of responding to climate change or preparing for disasters. For example, photographer Yky creates works such as *Shakes* (p. 12) that change over time depending on light exposure, mimicking the constant process of change we experience in our environment. Through the delicate beauty of his images, Yky invites the viewer to be attracted to change, not afraid of it. Art can also inspire people to envision a hopeful future on an individual level, and take action to help realize that future. Pitsho Mafolo’s piece *Redefining Life* (p. 2) captures the creativity and courage of people seeking to rearticulate their relationship to the world around them in the aftermath of tragedy.

Art and Science Collaboration as a Resource for Innovation

Emerging technologies are providing incredible new ways to explore, visualize, and communicate disaster and climate data. Adrien Segal's *Tidal Datum, San Francisco* (p. 18) creates an innovative and tangible representation of information contained in tidal records, collected over decades by government-funded scientists. Through collaboration with artists, risk experts can be inspired to think about their work differently, ask new questions, or find new solutions to seemingly intractable problems. One such collaboration is the Fresh Flowers Collective, an interdisciplinary team of artists, engineers, and scientists. Their piece *Scrubland Map* (pp. 22-24) reimagines how a risk map might be drawn to better connect with its audience through native plant species that resonant with locals.

Engaging Communities Through Public and Participatory Arts

Public art installations command attention, and when they are used to promote environmental awareness can help the public understand site-specific disaster risks. Carolina Aragón's installation *High Tide* (pp. 28-29) provides viewers with an immersive experience of the coastal flooding and sea-level-rise models for the cities in which it has been installed. Participatory art projects can help develop a common language for post-disaster reconstruction, one shared by experts and affected people alike. In this vein, Hanna Riyanto's *Resilience Kit* (p. 26) not only offers a collaborative activity that engages communities in their own vision of recovery; it also creates a visual product that illustrates communities' needs to anyone involved in post-disaster rebuilding.

Our Hope

The Art of Resilience should inspire individuals, communities, and governments all over the world to incorporate art into their work on this pressing issue. This catalog concludes with guidance collated by GFDRR Labs and the World Bank Group Art Program on how projects aimed at building disaster and climate resilience can productively and meaningfully engage with artists and their work. These recommendations build upon many years of cumulative experience working at the intersection of art and international development. We hope that they will help development partners engage with art as a powerful, if too often untapped, approach for building a safer and more equitable world.

An expanded digital version of this catalog, which includes additional inspirational pieces received from the global call for entries but not shown in the physical exhibition, is available at <http://art.gfdrr.org>.

Art as a Call to Action



Pitsho Mafolo

Democratic Republic of Congo

Redefining Life

2019

Mixed media on paper
186 x 166cm

Pitsho Mafolo is a mixed-media artist who weaves his African heritage and personal experience of relocation into his works. Focusing on what it means to be resilient on an individual level in the face of environmental and social challenges, he illustrates characters who are stretched into finding new ways to define their lives. His compositions are linear and graphic; details fill every inch of the paper and act as miniature vignettes, or short chapters, in a much larger and multifaceted story. Of his artistic practice, he states:

The lines of my drawings refer to destiny, which gives birth to a new life after surviving a disaster—describing a situation that erases everything only to be slowly filled in again with new colors and forms, like a phoenix born from its ashes.

Select Previous Exhibitions

Solo Exhibition, Culturel Judizmendi Center, Victoria-Gasteiz, ES

Solo Exhibition, Espace Mushagalusha, Montreal, CN

Education

Academie des Beaux-Arts, Kinshasa, DRC



Dana Hassan

Lebanon

If Not Now, When?

2019

Acrylic, Conté, graphite, markers and ink
on a concrete-coated canvas
90 x 55 x 6cm

Born in Beirut, Dana Hassan works at the intersection of business administration and visual storytelling. As a trained illustrator, she uses her graphic design skills to interpret urban environments. Inspired by her daily living in Beirut, she discusses this piece:

Cities age just like us. We tend to think of our cities as robust structures withstanding natural disasters. In reality, their urban skin is aging, accelerating dysfunction of their tissues and the need for maintenance of their normal functions. In this crumpled abstraction of Beirut, I went skin deep, exploring one of the oldest cities that, according to a legend, has been demolished and reconstructed seven times.

This three-dimensional fabric traces Beirut's dilapidated urban evolution. The drawings show how Beirut's nucleus has grown and neighborhoods evolved with a range of economic, urban, social, and cultural levels that have led to disparity in the nature of the urban fabric, threatening the disappearance of the city's unique character and its planning and design characteristics. Some drawings are orderly, while others are random. Some are in perfect condition and some are broken into pieces. The markings, cracks, circles, squares, and lines symbolize the "emotional faults" that Beirut needs to resolve—from tempering impacts, to reducing vulnerabilities and sustaining political commitment—in order to survive and thrive against future stresses and shocks.

Select Previous Exhibitions

International Festival of Comics, Syndicate of Professionals in Graphic Design and Illustration, Beirut, LB, 2004

Education

American University of Beirut, Beirut, LB
Academie Libanaise des Beaux-Arts, Dekwaneh, LB



Jovan Karlo Villalba

Ecuador

Tangled Roots and Neon Lights

2013

Oil on stainless steel
61 x 183cm

Jovan Karlo Villalba is a painter whose method combines expressionist mark-making with an additive and subtractive layering technique. The conceptual focus of his work is human beings' relationship to nature. He has been shown in over 50 exhibitions worldwide and featured in a documentary titled *Imagination Unleashed: An Artist's Journey*, which aired in the United States on Ovation TV.

Of this piece, the artist states:

Tangled Roots and Neon Lights was inspired by what is happening to the environment around me. The creative approach for this painting consisted of presenting transitional slices, side-by-side, to depict a narrative of a familiar coastal topography. A bird's-eye view of diagonally interwoven slices of rural flatlands, shrubby mangroves, urban foundations, and turbulent waters is shown making up the environment fabric that strives to hold together, as it tears itself apart. Reminiscent of a crack that forms when pressure is applied, darkness sets in from above and down the center of the landscape. Vertical shards and drooping powerlines flow downward across the panorama into angry waters, symbolizing man's descent and struggle to coexist with the land beneath their feet.

The work uses oil paint on brushed stainless steel. The steel platform functions as a mechanism to reflect and engage viewers, while completing an image that is in constant flux; the work thus navigates between a depicted and a real—and present—environment. This effect further emphasizes the purpose of the work: to bring light to the ultimate balance that symbolizes the delicate relationship that mankind has with nature, while reflecting accountability to every viewer that stands by to witness the travesty.

Select Previous Exhibitions

OG Kush, Artsy-Alfa Gallery, Miami, FL, 2019

Raw Pop Up, Art Basel, Miami, FL, 2018

Exposed, Art & Culture Center of Hollywood, Miami, FL, 2018

Education

Cooper Union, New York, NY





Justin Wood

USA

March Towards Extinction

2017

Natural debris from Hurricane Irma,
video projection
Dimensions variable

Originally from Virginia and now based in New York City, Justin Wood is an artist who focuses his practice on the overlap of the digital and physical worlds. *March Towards Extinction* is inspired by Hurricane Irma, the category 4 hurricane that hit Florida on September 10, 2017. Returning to Florida after having been evacuated, Wood was struck by the power of the storm and how completely it transformed his neighborhood. On this experience, and how it influenced his piece, he states:

Houses completely destroyed. Massive piles of wreckage and debris everywhere. I started transforming this ugly mess into monumental site-specific works by video projection mapping of various houses, boats, debris piles, and trees. The project became a nightly routine, and I started to sell prints of the photographs in an effort to raise money for the recovery. One thing that I learned was that the TV cameras and public attention fade rather quickly after an event like that, while the communities affected will spend years recovering. This sculpture is built from the same debris and wreckage that served as the backdrop of the projection I created in the Florida Keys, and the video tells the story of my evacuation and recovery experience. The screens are based on storm and climate data, as well as Taino mythologies about the origins of hurricanes. It is a document of the resilience I witnessed while participating in the recovery, and it serves to highlight that the process is still ongoing for many residents and business owners in the Florida Keys.

Select Previous Exhibitions

Bowery Days, 222 Bowery–ChaShaMa, New York, NY, 2019
March Towards Extinction, Spring Break Art Fair, Miami, FL, 2018

Education

School of Visual Arts, New York, NY



Maurice Mbikayi

Democratic Republic of Congo

Après moi, le déluge (After me, the flood)

2019

Computer keys, mutton cloth
230 x 266 x 4cm

Maurice Mbikayi interrogates the environmental hazards associated with information technologies in the Democratic Republic of Congo context. He collects discarded computer parts, then deconstructs and recontextualizes them in mixed-media collages and sculptures, combining them with other materials, including fiberglass bandages and found objects. Of this piece he states:

Rather than approaching environmental disasters from a purely critical stance, my work finds opportunities for growth. These sculptures reappropriate discarded computer parts, imagining a world in which e-waste is refurbished and recycled rather than dumped. By using found materials, I highlight the resilience of African people, who have found a myriad of ways to make use of limited resources. My sculptures depict figures who, in the midst of environmental, social, and political crisis, have created radical new approaches to reinvention and change.

Select Previous Exhibitions

Still Here Tomorrow to High Five You Yesterday, Zeitz Museum of Contemporary African Art, Cape Town, SA, 2019

Masks of Heterotopia, Officine dell'Immagine, Milan, IT, 2018

Education

Academies des Beaux-Arts, Kinshasa, DRC

Michaelis School of Fine Art, University of Cape Town, SA



Sushma Joshi

Nepal

The Quake

2016-2017

Watercolor on paper
24 x 30cm

Sushma Joshi is a Nepali writer and filmmaker based in Kathmandu, Nepal. Her fiction and nonfiction discuss Nepal's civil conflict and tell stories of globalization, migration, and diaspora. Her nonfiction has appeared in numerous publications, including the *Kathmandu Post* and *Utne Reader*.

In *The Quake*, Joshi captures the horror of having been buried in Mangal Hiti, Patan Durbar Square, in the 2015 Kathmandu earthquake. Combining watercolor paintings with a narrative written in first person, *The Quake* conveys Joshi's personal story of fear, hope, and triumph, including her search for ways to cope with the earthquake's continuing effects on her everyday life.

Select Previous Exhibitions

While Sushma Joshi is an established and prolific writer and filmmaker who has won awards for her work, she is an emerging visual artist. This is her first international visual arts exhibition.

Education

Brown University, Providence, RI



Carlos Rolón

USA

Maria

2018

Hand-cut silver mirror on aluminum panel
250 x 250 x 22cm

Rolón is known for his multidisciplinary art practice. *Maria*, a large-scale sculptural wall painting, was created with silver mirror on aluminum panel. The work visualizes the effects of Hurricane Maria, which is regarded as the worst natural disaster on record to affect the island of Puerto Rico, and the only recorded category 5 storm to hit the island as of 2018.

This piece is striking in its use of mirrors. *Maria* forces viewers to see themselves as fragments strewn across a curved surface. The curved surface is formed according to Hurricane Maria's pattern when it made landfall and was at its peak intensity. *Maria* is a unified force—whole and spiraling—yet forces every viewer to experience a fragmented state of being when confronted by it. The viewer's engagement with the piece mimics the disjointed lived experience of a hurricane.

Reflecting on the history of natural disasters in Puerto Rico and the United States, Rolón comments:

In the early 20th century and after the Great Depression, both the United States and Puerto Rico saw a rapid spike in industrialization, migrations, and tourism. Both saw the rise and fall of commercial sugarcane production, tourism, industrialized agriculture, and military bases and testing exercises. As these industries rose, the natural landscape took the brunt of abuses. Along with global warming, the expansions of attractions and high-rise complexes deteriorated the beaches, drained wetlands, and cleared wooded areas, making the island of Puerto Rico more susceptible to flooding and coastline erosion.

Select Previous Exhibitions

Outside/In, New Orleans Museum of Art, New Orleans, LA, 2018
When We Were Young, Arts Brookfield, New York, NY, 2018

Education

Columbia College, Chicago, IL



Yky

France

The Japanese Paradox

2018

Argent paper

17.8 x 24cm

Yky uses photography to symbolize urban resilience. His works are generally presented as diptychs—that is, as a series of two images (a stage 1 image and a stage 2 image) that combine to make one piece. The first photograph (stage 1) illustrates a hazard. This image is developed using a traditional chemical development technique employed in photographic darkrooms, which fixes light and darks onto the photographic paper in a permanent way. The second image (stage 2) depicts that same hazard but is produced using an iteration of the chemical development process that does not fix the lights and darks of the image in a permanent way, causing them to forever change depending on the light in their environment. The stage 2 image is developed on silver photographic paper in which some areas have been chemically treated with fixing or developer agents at given dilution and time, and some have not. As a result, when exposed to light the entire image continues to develop in a way that depends on the brightness, the UV index, and the refraction angle of light on the paper. This unpredictable development due to a multi-parameter process mirrors the elements of urban change and resilience. In these works, light symbolizes the hazard.

Considering himself a “citizen artist,” Yky came to photography as part of the search for a better way to communicate urban risks, hazards, and resilience. The entire basis of this work is that the images can never be stable. This instability recalls that of an urban space, which though resilient can never be taken as granted.



The Japanese Paradox in particular makes reference to *The Great Wave off Kanagawa*, a famous woodblock print from the artist Hokusai, thought to have been published sometime between 1829 and 1833, in the late Edo period. Of his piece, Yky states:

The great wave of Hokusai should be understood for its symbolic meaning, as almighty nature. The first picture presents an appropriate equilibrium between nature, human faith, and urban hazards. The second image questions the readiness for disaster risk with urban life being washed over by the wave. What does readiness look like?

Select Previous Exhibitions

Yky is an emerging artist; this exhibition is his first international show.

Education

Université Pierre et Marie Curie, Paris, FR



Yky

France

Shakes

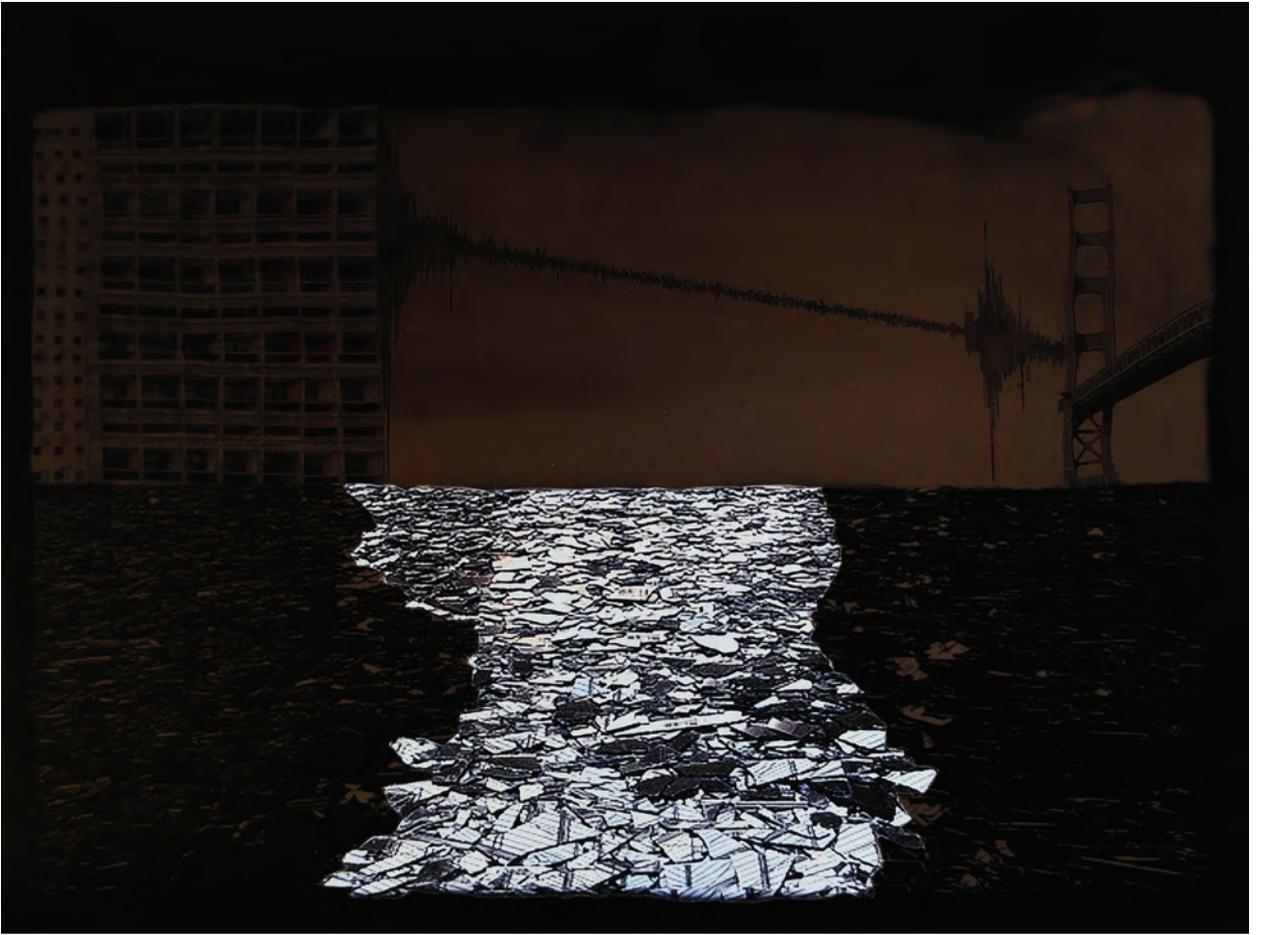
2018

Argentic paper

17.8 x 24cm

Shakes in particular questions the challenge of implementing an urban resilience strategy after widespread destruction. Playing with architectural symbols, broken reflections, and linear designs that recall an earthquake monitor as much as a heart monitor, Yky questions what it means to be fragile. The artist states:

Highlighting our urban fragility, the destroyed landscape of the first picture is surrounded by two meaningful iconic symbols, a Le Corbusier building and the Golden Gate Bridge, barely withstanding a quake. In the second picture, the landscape fades away. Only the broken glass path remains, suggesting perhaps that a better future where we can overcome our fears still remains.





Yky

France

La Seine

2018

Argent paper

17.8 x 24cm

La Seine questions how to balance tactics of mitigation and adaptation in the case of city flooding. Simultaneously, the work sheds light on our duty to protect our cultural heritage, acknowledging that its conservation also preserves our identity. Of his piece, Yky states:

In the first picture, the incongruity of the perspective is not detrimental to appreciating the architectural heritage visible in the background. In the second picture, only two houses in the forefront can be seen with the remaining cityscape darkened. The arrangement questions how to strike the right balance between urbanistic, environmental, and sociological dimensions.



Art/Science Collaboration as a Resource for Innovation



Adrien Segal

USA

Tidal Datum, San Francisco

2007

Steel, walnut
66 x 82 x 184cm

Adrien Segal is an artist and data sculptor based in Oakland, California. Her work has been exhibited internationally in galleries and museums and has been published in several books and academic journals, including *Boom: A Journal of California*, *Data Flow 2*, and *Arid Journal*. She works across disciplines and in a variety of three-dimensional media, including cast glass and bronze, wood, marble, metal, and clay, as well as in two-dimensional media (specifically drawing and digital data-based printed art). Of her three-dimensional practice, she states:

Sculpture is the means by which I reconcile conventions of reason and fact with an intuitive and emotive experience. I interpret the complex poetics of statistical information by translating data into lines, forms, and materials to reveal trends, patterns, and changes in the landscape that occur over time. Layers of tangible information are communicated intuitively as a refined and contextual physical experience from which knowledge can be elicited.

This piece, *Tidal Datum, San Francisco*, is a three-dimensional work that uses the National Oceanic and Atmospheric Administration (NOAA) Historic Tide Database for its conceptual inspiration and represents a full cycle of tidal ebbs and floods. Twenty-nine daily tide charts of the verified water level recorded at the NOAA tide station in Seldovia, Alaska, were translated into hand-bent steel and framed in a structure made from walnut wood. At the lowest, the water level is 4 feet below sea level; it is 21 feet above sea level at its highest.

Select Previous Exhibitions

Pale Blue Dot, The Laundry, San Francisco, CA, 2019

Documenting Change: Our Climate, University of Colorado Art Museum, Boulder, CO, 2019

Imagine Climate, Patton-Malott Gallery, Anderson Rand Arts Center, Aspen, CO, 2019

Education

California College of the Arts, San Francisco, CA



Adrien Segal

USA

Trends in Water Use

2011

Carved plywood, steel
56 x 105 x 96cm

Trends in Water Use is a data sculpture that graphs national statistics on 50 years of water use for thermoelectricity and irrigation in the United States. These statistics, from 1950 to 2000, are pulled from the U.S. Geological Survey report. The sculpture is to be read from top to bottom, with the uppermost layers representing water usage in the United States in the 1950s and the bottommost layer representing water usage in the United States in 2000. The entire shape of this piece forms the canyons of the Colorado and Green Rivers—sources of the water. When viewers look at the work at eye level, starting from an outermost edge and moving across the flat surface and down the curved line, they are tracing the linear graph created; water use is placed on the x-axis and the year on the y-axis. Since this sculpture was created, a new U.S. Geological Survey report—Circular 1441, released in 2015—shows a decrease in daily water use to an estimated 322 billion gallons per day, 9 percent less than in 2010. The 2015 estimates put total withdrawals at the lowest level since before 1970.

Select Previous Exhibitions

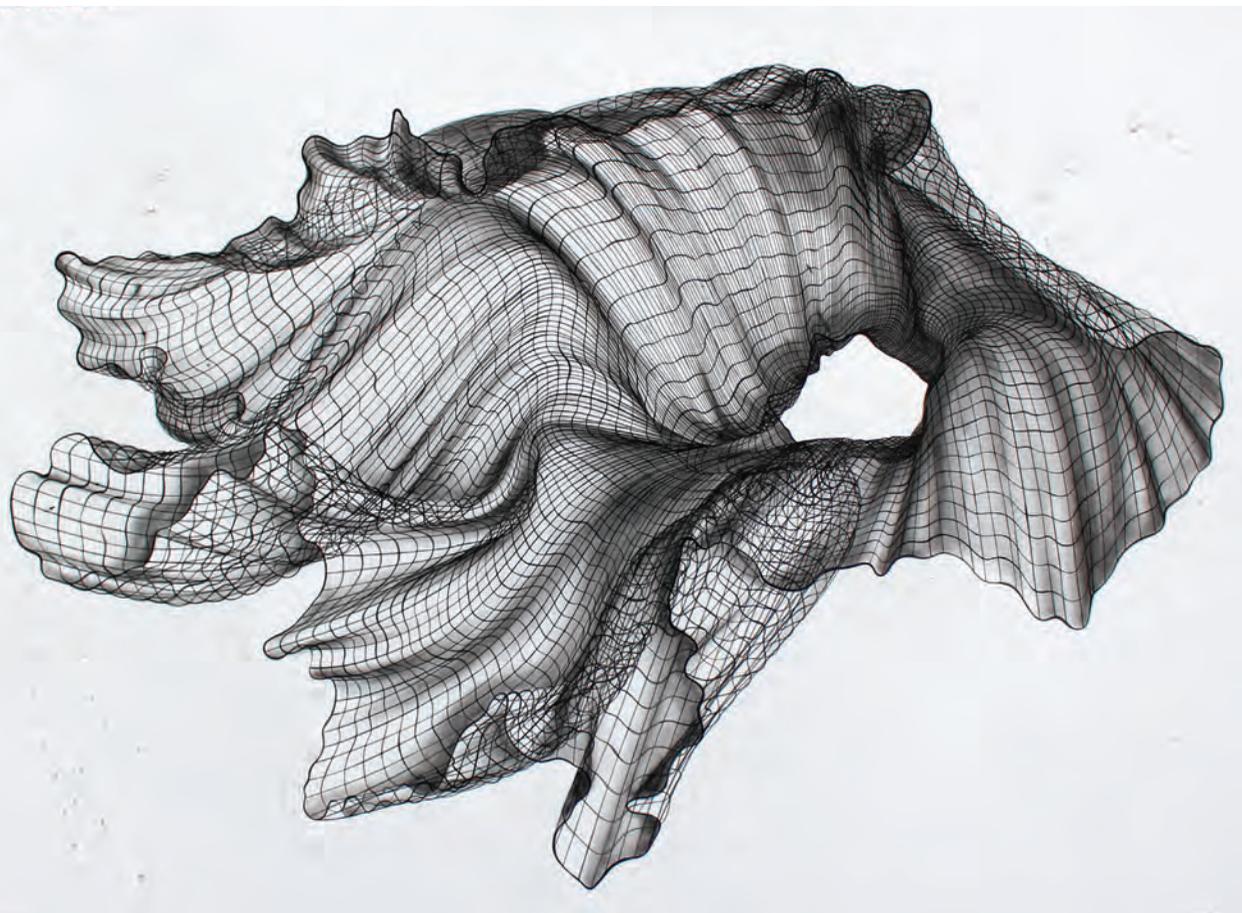
Pale Blue Dot, The Laundry, San Francisco, CA, 2019

Documenting Change: Our Climate, University of Colorado Art Museum,
Boulder, CO, 2019

Imagine Climate, Patton-Malott Gallery, Anderson Rand Arts Center,
Aspen, CO, 2019

Education

California College of the Arts, San Francisco, CA



Adrien Segal

USA

Rim Fire Progression

2015

Ink and charcoal on paper
66 x 102cm

This piece utilizes the fire progression map of the Rim Fire, which occurred in 2013 in California's Stanislaus National Forest. The progression map data were sourced from the Fire and Resource Assessment Program of the California Department of Forestry. The Rim Fire started when a lost hunter started an illegal campfire in a remote canyon in the Stanislaus National Forest just outside Yosemite National Park. The fire doubled in size overnight and within four days had consumed 100,000 acres. The fire's rapid spread was attributed to a record-breaking drought, a heat wave, past fire suppression efforts that had altered the normal fire regime, population growth, and Forest Service budget cuts. More than 5,000 fire fighters worked to contain the fire at a cost of \$127 million.

Select Previous Exhibitions

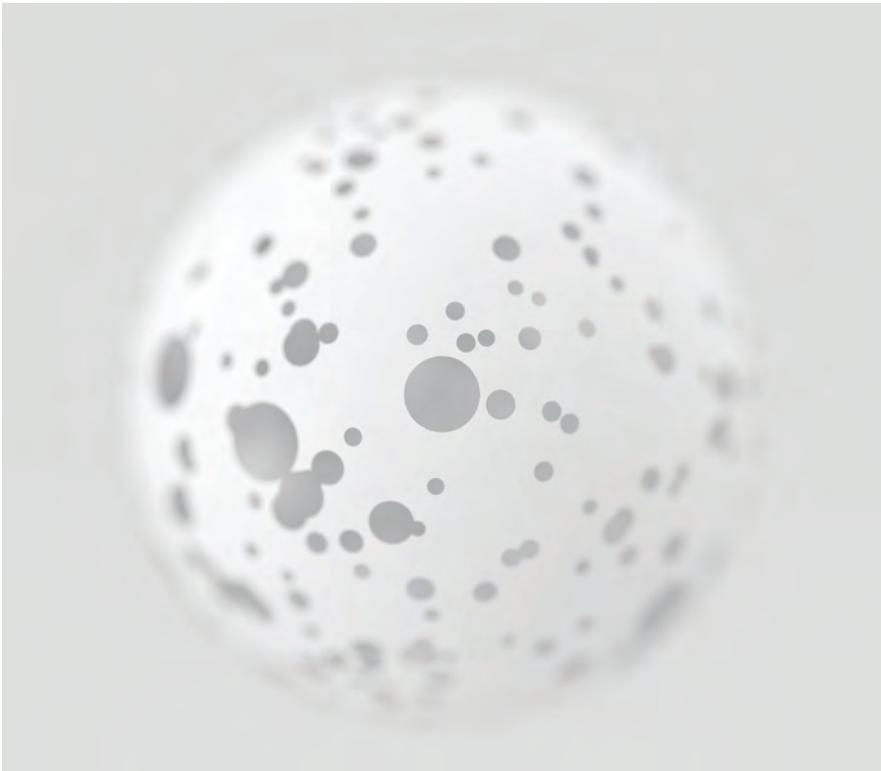
Pale Blue Dot, The Laundry, San Francisco, CA, 2019

Documenting Change: Our Climate, University of Colorado Art Museum, Boulder, CO, 2019

Imagine Climate, Patton-Malott Gallery, Anderson Rand Arts Center, Aspen, CO, 2019

Education

California College of the Arts, San Francisco, CA



Frederik de Wilde

Belgium

NEO_2034_2019-04-10-00-55-51-305 (NEO: Near Earth Object)

2019

Photographic 3-D rendering

140 x 140cm (dimensions variable)

Frederik De Wilde works at the intersection of art, science, technology, fine arts, media arts, and philosophy. The conceptual crux of his artistic practice is the inaudible, the intangible, and the invisible. De Wilde is a laureate and member of the Royal Flemish Young Academy of Belgium for Science and the Arts and has been a guest professor at the ArtScience Interfaculty in The Hague, Transmedia Brussels, and St. Martins College London. He has published essays and papers with Amsterdam University Press and Chicago University Press, MIT Press, and the journal *Leonardo*.

This image is a data visualization of all the potential locations where near earth objects (NEOs) could make impact on Earth. This data visualization was generated by a predictive software made by the artist and based on data from NASA (National Aeronautics and Space Administration) and Kaggle. In *NEO*, the Earth is represented as a thin sheet of paper perforated with holes. The holes represent asteroid impacts. The work was inspired by the events of December 18, 2018, when a space rock soared through the upper atmosphere at more than 71,500 miles per hour, broke up over an isolated stretch of the Bering Sea (between Russia and Alaska), and detonated with a power more than 10 times that of the atomic bomb that devastated Hiroshima. *NEO* frames asteroid strikes in a wider thematic exploration of subjects like impact, chance, and forecasting.

Employing a minimalistic aesthetic, *NEO* is coded such that it could also be printed in three dimensions and serve as a tangible model of the potential threats posed by NEOs. The artist aptly notes, "*Prediction is not limited to the art world. It's important in science, math, AI, insurance, and so on. Asteroids and meteorites are messengers from space that have had a significant effect on Earth's history and are likely to influence the future as well.*"

Select Previous Exhibitions

Hyperpavilion, Venice Biennale, Venice, IT, 2017

Art and Technology, Ars Electronica, Linz, AU, 2010

Education

Sint-Lukas, Brussels, BE

Royal Academy of Fine Arts, Antwerp, BE



Fresh Flowers Collective

Colombia

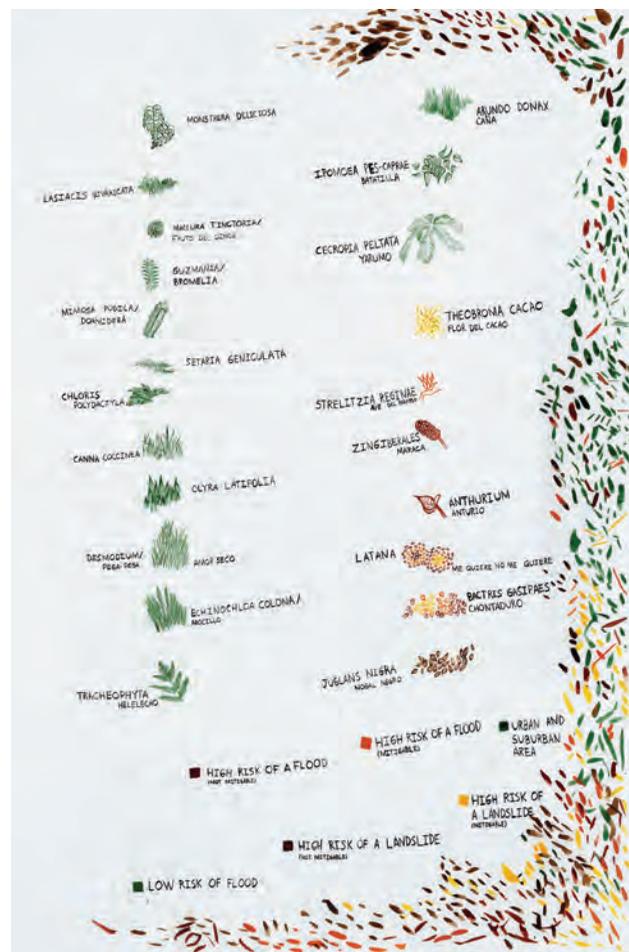
Scrubland–Map, Legend, and Detail Images

2019

Watercolor on paper
36 x 51cm; 25.4 x 38.1cm

Scrubland Map is designed to feel familiar to individuals living in Pereira, Colombia. Using native and commonly found flowers and vegetation from the region, the Fresh Flowers Collective has created the map to denote areas at high, medium, or low risk of landslides and floods. The areas of risk were identified according to the official risk map of Pereira.

The Fresh Flowers Collective is an artistic group composed of three individuals working in different disciplines: artist Laura Bernal has a background in electrical engineering and specializes in information and communication technologies; artist Daniela Maya focuses her practice on the plastic arts; and development specialist Camilo Fernández works on disaster risk management. The group concentrates its practice on the communication of big data and technical information to communities at the local level. The Fresh Flowers Collective was founded on the premise that complex problems require interdisciplinary teams, and that art is a tool uniquely able to condense large volumes of data into digestible images that are both intricate and familiar and accessible.



Of this piece, the artists state:

Just as maps must be dynamic, the vegetation and flowers of this artwork express dynamism. They grow, they expand, or they decrease with time. In this sense, Scrubland- Map reflects risk as something in constant movement. Like risk, the dispersal of foliage and flowers does not have a static pattern but rather obeys the complexity of the territory.

Select Previous Exhibitions

Fresh Flowers Collective is an emerging artistic group; this exhibition is their first international show.

Education

Laura Bernal: Universidad Nacional de Colombia, Bogota, CO

Daniela Maya: Universidad de Los Andes, Bogota, CO

Cristian Camilo Fernandez: Universidad Tecnológica de Pereira, Perira, CO;

Universidade de Coimbra, Coimbra, PT



Engaging Communities Through Public and Participatory Arts





Hanna Riyanto

Indonesia

The Resilience Kit

2018

3-D printing, balsa wood, acrylic and cardboard, digital drawing, recycled paper
40 x 30 x 30cm

Hanna Riyanto is an architect passionate about resilience in post-disaster housing and humanitarian architecture. Her experience in villages in northern Sumatra, Indonesia, has led her to focus her practice on the creation of culturally sensitive spaces in post-disaster environments. Noticing that villagers in Sumatra were adding makeshift structures to the housing provided by the government after the eruption of the Sinabung volcano, she realized that the housing did not meet families' spatial needs, and she began to wonder how to embed direct local involvement in the process of designing relocation houses following a disaster. Hallmarks of her solution consist of tangible, packable, and small-scale models and "decision trees" that can all be utilized as if they were game board pieces on a map. With this object-heavy approach, language barriers to understanding what local residents may need from their new living space can be overcome. Of her work she states:

I aim to minimize vulnerability by providing a guide on how to create culturally aware spaces that can be applied within existing shelters or in reconstruction of post-disaster housing, while also enabling the participation of refugees in the process. This method is delivered in the form of a "Resilience Kit" that consists of a resilience diagram and a decision tree that acts as a guide on how to design a culturally aware space. It also comes with a set of shiftable models that refugees can use as a communication tool to express their spatial needs. The kit is made into a flat-pack package that can be delivered to the site of disaster or refugee camps, where nongovernmental organizations or spatial designers can get insights into the refugees' spatial needs and make decisions on how reconstruction after a disaster should take place.

Select Previous Exhibitions

There and Back Again, Center for Circular Design, London, UK, 2018
Tate Exchange, Tate Modern, London, UK, 2018

Education

Universitas Katolik Parahyangan, Bandung, IN
University of the Arts London, London, UK



**Makeshift Structure
within the Post-
Disaster Housing**

2018
Digital photograph
25.4 x 30.5cm

**North Sumatran
Longhouse after the
Volcanic Eruption**

2018
Digital photograph
25.4 x 30.5cm





Photograph by Matt Conti

Carolina Aragón

Colombia

High Tide

2016

Fiber glass rods, dichroic Plexiglas

609 x 915 x 183cm

Carolina Aragón was born in Cali, Colombia, and is a public artist who creates lightweight, ephemeral installations that come to life in response to environmental stimuli, such as wind and light.

Her artwork is inspired by natural and environmental phenomena: clouds, marshes, and flocks of birds are reinterpreted in dynamic, often hand-made, compositions that are overlaid on urban environments to create unexpected moments of wonder. High Tide is an abstracted marsh landscape. Using translucent disks placed at varying levels, Aragón marks the various water levels of past and predicted floods, bringing attention to the shifting boundary between land and water.

Of her work Aragón states:

I think of my artwork as an emerging form of art for adaptation. I define art for adaptation as artwork that provides public access to positive aesthetic experiences, innovative technologies, and information supportive of climate change adaptation. My work focuses on creating site-specific visualizations of climate change-induced futures through landscape installations that seek to increase public engagement through pleasurable aesthetic experiences. In particular, my installations visualize future flooding risks associated with sea-level rise, depicting future flooding scenarios in a nonthreatening way. Although simple in their construction, they achieve the complexity of an organization of organisms as each piece individually responds to environmental conditions.

Aragón's research and creative work are carried out in her capacity as assistant professor in the Landscape Architecture and Regional Planning Department at the University of Massachusetts–Amherst. They embody a view of public art as a medium for experimenting with innovative materials, transforming urban landscapes, and engaging communities. Her current work involves the incorporation of smart materials in public art applications and the development of public artwork to increase engagement with climate change adaptation.



Photograph by Matt Conti

Select Previous Exhibitions

FutureWATERS | AGUASfuturas, East
Boston Greenway, Boston, MA, 2018

Photoluminescent Labyrinth, University
of Massachusetts–Amherst, Amherst,
MA, 2016

Education

Savannah College of Art and Design,
Savannah, GA

Harvard Graduate School of Design,
Cambridge, MA



Kukuh Ramadhan

Indonesia

Otonom (The Tale of Ngata)

2019

Natural debris from 2018 earthquake
on the coast of Palu Bay

Dimensions variable

Kukuh Ramadhan is a multimedia artist living and working in Indonesia. After the disastrous earthquake of September 28, 2018, he began working with his collaborator Ruang Dualapan, a community architectural activist, to develop several programs aimed at empowering local victims. The goal was to enable those affected by the earthquake to make independent and immediate improvements to their surroundings.

Otonom was one such program. This temporary, site-specific sculpture was constructed in the Palu Valley over the course of seven days using the debris collected from the earthquake. To design the structure, the artists turned to the oral folklore passed on by members of the Kaili ethnic group, who live in the Palu Valley. Natural phenomena of the area feature prominently in this folklore. Many of the folkloric words were developed by the Kaili people to describe the environmental characteristics of the land. By embracing these traditions, Ramadhan sought to showcase the importance of exploring often-overlooked venues for knowledge—such as linguistic traditions—to rebuild in the most impactful and respectful way after a disaster.



Select Previous Exhibitions

Media Art Week, Local Genius,
Palu Central Sulawesi, IN, 2018
For Our Art Identity, RDL Art Space,
Palu Central Sulawesi, IN, 2016

Education

Universitas Komputer Indonesia,
Bandung, IN



Eduardo Feuerhake Aguero

Chile

The Indus River Game

2011

Mixed media on paper

82 x 54cm (dimensions variable)

Eduardo Feuerhake Aguero is both an artist and an emergency and resilience specialist. As an instructor at the Università Luav di Venezia and a consultant for UN-Habitat in Mozambique, he explores topics related to the theory and practice of disaster mitigation.

This game was distributed to thousands of children across Pakistan to teach them how to cope with natural disasters. Considering the impact of the earthquake in 2005 and consecutive years of intense flooding (2010–12), Aguero sought to create something visual and tactile that the younger generation—the generation who will be managing future natural disasters most intensely—could understand. The game uses informative captions, a mix of realistic and cartoon imagery, and friendly words of warning and is at once directly instructive and artistically charming. Of this piece, Aguero states:

Using bright colors, simple compositions, and a touch of humor, this game is structured to help the children understand the behavior of the river, its journey through the whole country, and the many problems and potential solutions connected to its banks. Drawings were carefully done to respect the shapes and forms of principal monuments, landscapes, and typologies already existing in the country so that the game could feel familiar to the children, and thus easily relatable. The goal was to inspire in the children a change of attitude when facing natural disasters, a change that will promote a preparedness approach for future catastrophes.

Select Previous Exhibitions

UN Pavilion Art and Architecture, World Economic Forum, Global, 2012, 2014, 2018

Education

Universidad de Chile, Santiago, CL

Guidance for Practitioners

- 1. Clearly specify the goals of your project.** This catalog has provided a variety of examples of how art can contribute to disaster and climate resilience. Before embarking on a project, it is necessary to decide what kind of impact your project will make. Consider reaching out to GFDRR Labs, the World Bank Art Program, or other organizations with relevant experience for inspiration or support.
- 2. Define what kind of object, product, or artistic process you are looking for.** Are you looking for artists that are representative of a certain background, or based in a certain city, country, or region? Are you looking for any artist across the globe as long as the artwork talks about specific themes? Or is your goal very specific? For example, you might be looking for an artist from the South Asia region who works in the form of large public art sculptures and is willing to produce a new work for you, using project data as inspiration.
- 3. Identify curators, cultural nonprofits, museums, and galleries through online research, or by reaching out to your network for their contacts.** Try to identify local organizations or partners that work with the kinds of artists, or in the regions, you are interested in. Be thorough and democratic in this process. Consider the source of the artist recommendations: galleries and museums tend to work with artists who are already established, whereas cultural nonprofits and curators are more in touch with artists working at a grassroots or emerging level. To build trust with the artists, be clear about why you want to engage with them specifically, and what the parameters of your project topic are.
- 4. Focus your conversation with artists around key factors.** Once you have identified appropriate artists, work through the details of your engagement according to the following touchpoints.
 - a. The ask:** Confirm the number of artworks you are expecting, as well as their sizes and mediums. For community-based artworks, define the participants and your expectations for their involvement. Also explain to the artist(s) that your team will be curating the final collection or exhibition, and thus managing the ultimate messaging and the context in which the art is shown.
 - b. Timeline:** Provide a clear deadline for when the work needs to be shipped to you. Buffer this timeline, as there may be unforeseen shipping delays related to customs paperwork for artworks crossing borders, and as artists often work until the very last day they have to complete a project.
 - c. Exhibition location:** Confirm where the artwork will be shown (i.e., at a conference your project team is organizing, or at the organization headquarters, public space, local gallery, government office, etc.) and reach out to the appropriate facilities managers of that space to ensure that you will have what you need to safely and securely install the artwork.

- d. Shipment:** Define whose responsibility it is to manage necessary shipment. If you are using an art courier service instead of a general shipment service, share that fact with the artist. Many artists prefer to work only with art-specific shipment services. Artists should get in touch with their respective ministries of culture when shipping works abroad to ensure that they have the needed paperwork.
 - e. Compensation:** Professional artists earn their livelihoods through their work and spend years developing their practice. If you have a line item in the budget that you can use to compensate artists, let them know what that is and find out if they are willing to work within that number. If you have no budget for artist compensation, make this clear from the beginning. You can then explore an engagement with the artist if he, she, or they would be willing to participate out of particular interest in the project, or in order to gain exposure to a potential new market for their work and gain recognition by an international institution.
 - f. Legal agreements:** Every engagement with an artist must be supported by a contractual agreement.
- 5. Keep in mind that sometimes artists work in challenging conditions.** Where and how artists work can impact how much they are able to give and how much assistance they may need from you.
- a. Artists across the world work in a variety of settings.** Some form collectives or workshops while others maintain single studios. Professionally, some are represented by galleries or nonprofit cultural spaces that raise awareness of their work, help them secure participation in widely seen exhibitions, or sell their work. Others function independently and act as their own representative. One important factor when identifying various artists best suited for your project is understanding what other support structures they are—or are not—a part of, since this may impact their suitability for your project.
 - b. Artists use their lived experiences, which are a function of various social, political, and economic factors, and weave them into innovative products to inspire different ways of thinking.** For this reason, they are sometimes considered political dissidents by their governments or communities. This is not always an accurate, or bad, label. Depending on the scenario in which you are working (i.e., if you have identified an artist in an unstable or repressive context), pay very close attention to the political implications and possible risks the artist may be exposed to when involved in project work.

The Art of Resilience

The World Bank Group, Washington, DC,
October 29, 2019–January 19, 2020

The ArtScience Museum and
Singapore Expo Center, Singapore,
May 16, 2020–May 24, 2020

artofresilience.art

An exhibition featuring artists from around the world who are using their art to advance disaster and climate resilience

450 submissions

140 artists

20+ selected art works on display

artofresilience.art

