WATER URBANISM

RESILIENT COLOMBIA DOUBLE DISPLAMENT AT THE WATER'S EDGE

URBAN DESIGN SPRING STUDIO 2023



COLUMBIA UNIVERSITY GSAPP

M.S. ARCHITECTURE AND URBAN DESIGN PROGRAM

URBAN DESIGN III STUDIO | SPRING 2023

RESILIENT COLOMBIA: DOUBLE DISPLACEMENT AT THE WATER'S EDGE

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STUDIO OBJECTIVES

This studio explored watery landscapes and contested urban terrain in Colombia, with a special focus on climate justice in Cali, Cartagena, and Bogotá. As a studio we asked, how has risk been produced and experienced through spatial exclusion, urban planning, and design? How can we approach "resilience" critically and understand the confluence of social, political, and ecological factors?

Rapid development in Cali is provoking investment in the levee system El Plan Jarillón which is intended to "protect" people; however, this adaptation project is also an engine of displacement. How does exclusion from the housing market create and formalize risk?

In Cartagena, diminishing water quality and the crush of extractive tourism threatens its bays and creates a divided city of haves and have-nots.

Bogotá's rapid growth encroaches on the critical landscapes of the Cerros de Bogotá, the globally significant paramos ecosystem, and Río Bogotá. How does the right to housing intersect with broader ecological imperatives like ecocide, deforestation, and the collapse of biodiversity and clean water?

Students and faculty worked together over the course of the semester to explore how urban designers can act as multipliers of change, integrators of expertise, visionary partners, allies, and advocates.



PROJECT INITIATIVES | BOGOTÁ

REVITALIZACIÓN DEL RÍO TUNJUELO

- Creating a continuous public realm along the length of the Tunjuelo, the main tributary of the Bogota River Addressing a legacy of industrial contamination through
- remediation and re-naturing
- Connecting built fabric to an expanded river zone
- Centring indigenous history and honoring Muisca cultural sites

RECUPERANDO LA SABANA DE BOGOTÁ

- Softening the urban landscape along the Bogotá river and its tributaries
- Looking at industrial pollution and opportunities for new housing Integrating new forms of mobility, structures of care and landscape
- into the urban fabric

LAS COMUNIDADES LIDERAN LA CONSERVACIÓN

- Learning from and alongside community activists to realize Bogotá's potential as a global biodiversity hotspot Valuing Bogotá's forests and humedales, and amplifying community actions and citizen science in range of neighborhoods



PROJECT INITIATIVES | CARTAGENA + CALI

REPARANDO LA BAHÍA DE CARTAGENA

- on all of Cartagena's citizens and imperiled landscapes
- the Ciénaga de La Virgen.
- and petrochemical economy

JUSTICIA PARA EL AGUA DE CALI

- geography
- Diversifying Cali's urban landscape and economy.
- Expanding access to the Cauca River for all.
- Celebrating Cali's joyous dance and food culture

Shifting away from Cartagena's extractive tourist economy to focus Centring a broad restorative and innovative housing initiative on

Cleaning plastic waste out of Cartagena's canals and integrating waste into a new circular economy as a counterpoint to tourism

Diversifying forms of water holding and capture across a broad

Reducing the socio-environmental pressure on the Jarillon. Centering housing justice in the environmental movement

COLOMBIA | CLIMATE CHANGE + THREATS



The goal of our studio was to workshop and test the implementation of water sensitive urban design in a Justice context. We worked across transects inclusive of Amazonian forests and coastal plains, integrating urban design imperatives, sustainable fisheries management to innovative green infrastructure finance models and shoreline restoration. Students and faculty worked together to devise alternative futures in these ecoregions that address pressures of housing, livelihoods, transportation, and social justice issues.





PROJECT CHAPTERS





BOGOTÁ

Nestled amidst the towering Andes and surrounded by the Bogotá River lies Bogotá, a city with an unbreakable bond with water. Water is very deep within the identity of the city, its wetlands, smaller rivers, and the paramos. Having survived a series of conflict, displacement and ecological loss, it still remains one of the fastest growing cities with immense biodiversity. A home for over 2000 species of plants and animals, bogota is in constant negotiation with its ecosystems.





01 USME NATIONAL PARK

UPPER TUNJUELO

Expand the sponge system down to protect paramo from urban expansion

TEAM

Hanfei Fu Wenjun Zhu Jiani Dai Xiutong Yu

PROJECT SUMMARY

The Tunjuelo River, which originates in the Sumapaz Paramo south of Bogota, is a vital source of water for the city. However, ill-managed growth of the city has endangered both river and community, causing the river and the communit landslides, flooding, and pollution. Usme National Park aims to revitalize the ecosystem of the Tunjuelo River and strengthen the connection between the city and the Paramo. It is a strategy with three components: the first clean the river and create ecological buffers to protect it from further pollution; the second will establish sustainable communities adjoining the park that reduces pollution and ensures a clean watershed; and the third will promote eco-friendly tourism to raise awareness of the Sumapaz Paramo's significance and need for protection. We foresee Usme National Park being a vital catalyst in restructuring South Bogota, providing people with a natural resource while enhancing the environment.





UPPER TUNJUELO - "A Vital Source of Water for Bogota"

Upper Tunjuelo River originates from the Sumapaz Paramo in the south of Bogota and is a vital source of water for the city. For half a century, Usme and Tunjuelo River have been contributing to the city's development. Nowadays, it seems the river have done their job, but only the pollution, flooding and a dried sponge have been left by the city for Usme people.

So, we foresee Usme National Park as a vital catalyst in restructuring south Bogota, providing people with a natural resource while enhancing the environment.



Tunjuelo river worked as a potable water source



The city extracted concrete along riverland



Pollution, flooding, a dried sponge





VISION 1 A Clean and Resilient Water Source



VISION 2 An Experiential And Participative Eco-Tourism



VISION 3 A Sustainable Community Infrastructure System













01 LANDFILL MOUNTAIN WITH LANDSLIDE

The only landfill of Bogota, Doña Juana landfill, is in proximity to the Tunjuelo River. It is polluting the environment through the waste liquid and toxic gas.

02 MINING ACTIVITIES CAUSING BARREN LANDS

Following mining activity, there has been a surge in the construction of self-built housing amidst barren mountains. Residents in these areas are exposed to housing risks and air pollution, which are causing significant suffering.

03 URBAN EXPANSION IN PROCESS

The urban area is expanding. It is overtaking MUISCA traditional farmland and heritage. Farmers have to look for higher farmland even near the paramo.



UPPER TUNJUELO RIVER 2023

We envision an Usme National Park which can extend the sponge system as an edge of Bogota to protect Paromo from urban expansion.

Baueduct

PARMOS

RB

BIBLORED

P/ac

poyos

First, We propose to **filter** the river water by reshaping the riparian zone, establishing buffer areas, and restoring native species. Second, we want to **connect** through the Culture Sponge. We want to create an experiential trial to revitalize the indigenous culture and engage people in local activities. Last, we want to **activate** through the Community Sponge. It can absorb excessive urban expansion, and transform it into sustainable communities through green infrastructures.

UD STUDIO III - USME NATIONAL PARK



ALTRADUCTION DE ROSANIE UCCETTRADA DE PLANEACIÓN

PEMP Pror Expected de Research

POT

Ċ





THREE TEST SITES AT THE NATIONAL PARK

Based on 3 different fabrics, we chose highland, Usme Community and Cemex as our testing sites. We will test the three strategies connect, filter, connect and activate to create a new vision for Usme National Park.

Our design will preserve the Paramo ecosystem, while expanding permeable soil to foster sustainable agricultural and urban expansion.

02 THE MEANDERING MIDDLE

TUNJUELO MEDIO

<u>Retrofitting urban fabric</u> by integrating <u>revitalized river</u> <u>meanders</u> to create a new water holding system in the Tunjuelo River.

TEAM

Marina Guimarães Nupur Shah Reya Singhi Saloni Shah

PROJECT SUMMARY

The Tunjuelo River's meanders once slowed its flow and increased its holding capacity. However, urban development has resulted in the cutting off of these meanders, leading to flooding and heavy pollution. Our project aims to address these issues by reintroducing meanders to the river, at varying scales and for different levels of flow, within the river and the existing urban fabric. This will not only slow and clean the river, but also generate a sense of collective identity and opportunities for water and society to interact in a mutually beneficial relationship. The involvement of existing and new environmental stewards from the community will play a crucial role in reducing pollution and promoting sustainable practices, leading to an improved environment for future generations.



TUNJUELO MEDIO: FROM UPSTREAM TO BOGOTA'S SAVANNAH

As the water flows downstream from the Paramos, not only pollution increases but also the river ends up getting lost and erased in the articulation of the urbanized areas of Bogota. Water has its quality drastically decreased from its source in the La Regadera dam to its endpoint in the Bosa neighborhood, as the river passes through four major sources of pollution: crops, landfills, construction sites, and tanneries. The river's journey is characterized by concretized banks, stagnant ponds, and compromised water systems, which are disconnected from the surrounding environment and contribute to a lack of belonging among residents.



La Regadera Clean water Source

Usme



MEANDERING WATERS

The meanders of the Tunjuelo River once functioned to slow its flow, increase its holding capacity, and filter out pollutants, allowing the surrounding ecosystem to thrive. Until a few decades ago, the river was part of a connected system, with wetlands extending throughout large green areas. The growth of urban areas respected the river's natural flow, which enabled the neighborhoods surrounding it to be integrated in harmony (1.1).





CHANNALIZED RIO TUNJUELO

Over the past decade, the Tunjuelo River has been modified through chopping, cutting, and sculpting, which has reduced its surface area and eliminated meanders from its winding paths. This erasure has negatively impacted nearby neighborhoods and continues to be a major cause of serious floods. Bosa, located in the basin, has been particularly impacted, and despite mitigation efforts, the underlying issue persists. (1.2).





AN INTEGRATED SYSTEM

The main goal of our project is to slow and clean the Tunjuelo River by retrofitting the urban fabric and reintroducing old meanders as well as creating new ones in the middle Tunjuelo. This will allow for mitigation of floods at multiple scales, preventing them from reaching the lower parts of the river, while also filtering the polluted water coming from upstream. (1.3).



1.1. Overlay of 1980 map showing a connected and thriving system of water and wetlands.

1.3. Proposal of a water holding system with meanders reintegrated into the current urban fabric.

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Latin America Water Funds Association

San Benito District

ACEMENT AT THE WATER'S EDGE 39

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RETROFITTING THE MEANDERS TINGUA AZUL WETLANDS AS A SAMPLE SITE

The Tingua Azul wetland used to be part of the Tunjuelo River's natural flood zone. However, the construction of Villavicencio avenue divided the wetland into two sectors - eastern and western - causing high levels of noise, air pollution, and garbage accumulation that severely affect the ecosystems.

To address this issue, the Tingua Azul retrofit project aims to restore the lost ecosystem by reintroducing meander paths and integrated wetness. This project is part of the Mayor's 14year plan to protect wetland ecosystems.

Hornworth water plant

Retrofitted Avenue to two car lanes and multipurpose use on the edges

+ Filtering Marshes

Existing basketball courts to remain

+ Wetland Pools

Pedestrian Boardwalk with observation decks above the wetlands

Multipurpose

and the

Rio Tunjuelo

Restored Meander

Wetlands Pools



REVINVING THE LOOP SAN BENITO AS A SAMPLE SITE

San Benito tanneries are the major source of pollution of lead and chromium metals directly polluting the Tunjuelo. Due to this continuous contamination of the river, the people of the neighborhood are under a constant threat of second displacement by the government in the name of environmental protection which would lead to the loss of their livelihoods. To address the pollution, the project will include water treatment as part of its strategy to de-concretize impervious surfaces by cutting and filling the soil, creating a gradient of high and low lands capable of restoring water flow. Along with the formation of meanders, it will create more opportunities for social gatherings around.

+ Sloped riverbanks connected to existing waterbodies

lew meanders within the +---retroffited urban fabric

Activated pedestrian iverfront maintaining

Activated pedestrian riverfront

+ Retrofitted basketball court to Community Center

Social Mounds as backyards + for residents' daily activities

Vehicle access

+ Water inflow from upstream

7,0-8,0m min to max water level + Existing pedestrian

+ Widened riverbanks

POLIETE DISPLACEMENT AT THE WATER'S PAGE 43



03 MUISCA LOWLANDS

LOWER TUNJUELO

Reimagining urban landscapes through healing our relationship with wetness.

TEAM

Donnal Baijnauth Heer Shah Iza Khan Jacqueline Jingyi Liu

PROJECT SUMMARY

Muisca Lowlands seeks to heal people's relationships with water by reimagining ways of living with gradients of wetness. The core of our proposal is a densification strategy that goes beyond conventional land-use planning to incorporate time, seasonality, changing water levels, and calibrated agriculture and aquaculture practices. Following the traditional Muisca camellones way of sculpting highground and lowground, we weave a new tapestry of living, with infrastructure elevated high and living activities below, a symphony of agriculture, aquaculture, and community that works by the rhythms of water. We see Muisca Lowlands as an agent of change that can spread along Rio Bogota, Rio Tunjuelo, Mosquera, and Soacha, instigating a paradigm shift toward a sustainable landscape where humans and nature coexist in harmony and wetness is embraced as a key element within the urban built environment.



CONFLUENCE

Bajo Tunquelo has been at the receiving end of pollution and contamination. The expanding city has encouraged the concretizing of the natural landscape. We reimagine a landscape that is allowed to breathe and thrive while providing people access to communal and economic opportunities.





UD STUDIO III - LOWER TUNJUELO





no densification zone
metro red line
densificaiton zone
biofiltration system
camellones
Bosa
Mosquero
Soacha

By seeking to address the risks of flooding and displacement in vulnerable communities along the river, we propose a no densification policy along the Tunjuelo and Bogota Rivers, and introduce a biofiltration system. At the same time we plan to increase density in areas along the metro in a way that is sensible to the local environment and community needs. Eventually, we plan to incorporate traditional Muisca methodologies of living with water in new developments by letting the water breathe and considering gradients of wetness to create a sustainable and resilient landscape.

UD STUDIO III - LOWER TUNJUELO

HOW CAN WE LIVE WITH WATER?





CLUSTER SCALE ACCESS

 \oplus distribution hub \oslash access route

HOUSING

 $^{\odot}$ high density $^{\odot}$ low density



PROGRAMS

Daquaculture Obiodiversity reserves Obiofiltration ponds Ocare zones

AQUACULTURE AND FLOURISHING ECOLOGIES

ANDEAN ALDER AS ACTOR OF CHANGE

AGRICULTRE LAND ENVOKING SENSE OF BELONGING

同時期

Same -

TEMPORALITY OF STREET FRONTAGES







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DOUBLE DISPLACEMENT AT THE WATER'S EDGE 59

04 NETWORK OF CARE AND WATER

LA VACA WETLANDS

Integrating new forms of mobility, structures of care and landscape into the urban fabric.

TEAM

Devanshi Gajjar Rutwik Karra Xu Cheng Yaoze Yu

PROJECT SUMMARY

Network of Care revives the Sabana de Bogota, a wetland that the Muisca community once inhabited with a sense of care that recognized water and other ecosystems as a part of their community. Today, this wetland is severely depleted by a city's impervious surfaces, polluted with trash, and disrupted by floods. Our strategy is to make water visible in its many shades of blue and green particularly in streets and existing concrete ditches built to drain water to the Bogota River, and to connect this growing visibility with current remnants of the wetland that currently stand isolated. Along with water visibility, we expand the ideals of Care Blocks, a social Infrastructure project initiated by the city, to care for and guide this revival of a wetland system and related natural ecosystems. Our aim is to create a city that promotes stewardship through a Care Network that considers water a partner in inhabiting the Sabana de Bogota. It is a shift from water fear to water trust.





Map of Savannah of Bogotá, Archiveo General de Indias (1614)

Present day Bogotá

0.1 CARE NOW AND THEN

For the Muiscas, the indigenous community of the Sabana, care was not limited to the community, but also in the ways of living with other ecosystems. Today, Bogotá is a city of overflows. An overflow of internally displaced people and an overflow from transit oriented development. Most importantly, Bogota is now a settlement at the edge of overflowing water. Where as care in the past meant care for the social realm, along with ecological care.

Today, this knowledge of care is manifested in the spatial form in existing community buildings. Care block is the city's flagship social infrastructure project, that liberates care-givers, (which is the women in the household), from their care work, to provide them with free time. They are encouraged to learn new skills that can make them employable, building an interconnected social capital. This Care Block gives women a Bank of Time, allowing women of households to pursue their hobbies and further their education.









antinen terrer 0.0

UD STUDIO III - LA VACA WETLANDS





The extension of this care network towards ecology begins at the scales of the canal network, and includes extension of wetlands, transformation of the river, and development of a vision of the city with the reclaimed sabana.





The concrete canals are proposed to be de-concretized and transformed into water holding systems. Hence, becoming avenues of exchange of information, education, care and co-existence of ecosystems.

0.1 NEIGHBORHOOD AND CANAL SYSTEM TODAY 0.2 CARE EXTENSION TO DITCHES AND PUBLIC SPACES



0.1 LA VACA WETLAND 2070 0.2 CO-EXISTENCE 2070



A sectional vision of the Expanded La Vaca in 2070, negotiating edge with the Corabastos Market. A large low ground with water retaining plants along the edges, and biofiltration plants in the water create habitats and public spaces.

2070 | Co-existence of public realm, public transit and water - Streets become a combination of movement and water.



Ditches in 2070 | Care becomes an aspect in design that promotes community in stewardship of water and maintenance. These care activities change over seasons and longer periods of time.



the region is imagined.

River and the city in 2070 | A water-side is created for the community. From recreation to the Sabana ecosystem, a large low ground that has the capacity to hold, absorb and facilitate the flow of water downstream without flooding
05 EXPANSION OF THE FUCHA RIVER

FUCHA RIVER

TEAM

Qiannan Guo Zicong Liu Yiwan Zhao Haoyu Zhu

PROJECT SUMMARY

Our project deploys a rezoning strategy to reclaim, revive, and revalue waterbodies in the Bogota savannah to create a robust and stable urban ecology at the waterfront. It creates financial opportunities, treats wastewater, and restores wetland ecology. People can only appreciate the value of these water bodies if they are aware of the importance of clean and safe water.

We therefore reimagine the Fucha River as a new, selfpurifying water-holding system, connecting existing low grounds and remnent wetlands with the river. In the process, we bring value to the waterfront, break the barriers created by the current river's concrete channel, increase job opportunities, and densify housing in Bogota city.





UD STUDIO III - FUCHA RIVER









Bogotá | 2080

Fucha River | Design Strategy

We are proposing the Fucha river as a new holding system to connect the canals, wetlands, and rivers and finally to reclaim the Sabana plain. The water bodies will be reconnected into a new urban ecology system to be more stable and robust.

Our main concept here is to extend the river bank and transform the concrete canal into natural landscape with softening materials and improved green infrastructure. And most importantly, bring this environment into the urban fabric and be accessible to local people.



Expansion of River

Body

Cuting off the

Untreated Water

Fucha River

in 2023



Connecting & Restoring

the Wetlands





Fucha River Based Planning











River, which will also serve as the last purification point before the water flows into the Bogota River. The main goal of the design is to restore the natural environment, and the green infrastructure could gradually permeate the surrounding community, which could provide people a more healthy and natural neighborhood to live in.



Wetland more about nature and realize the importance of protecting nature.

UD STUDIO III - FUCHA RIVER



DOUBLE DISPLACEMENT AT THE WATER'S EDGE 81



Our design is focusing on the highly polluted segment along the fucha river. Because both illegal domestic sewerage and untreated waste water from butchers or recycle center are directly connected to the river, it's necessary to cut off the release and have regulations immediately.





The first step is to regulate the pollution and add pretreat structure. In residential areas, we are turning the vacant hard ground into neighborhoods garden and add a fermentation tank beneath it. The recycle warehouse has a potential to become public facilities such as a laundry room for the community. In this method, we could gather the waste water and pretreat it. The next step is to add biological water purification structures. We will break the concrete river bank and widen it, and add bio thermal sand filtration ponds along the sewage systems.





COMMUNITES LEAD CONSERVATION

Bosque Calderón

Quebrada Las Delicias

Juan Amarillo

humedales





DOUBLE DISPLACEMENT AT THE WATER'S EDGE 85

06 FOR THE BIRDS STEWARDSHIP AND REPAIR

JABOQUE WETLAND

TEAM

Siwei Tang Lianghao Cheng Rubin Lian Hongfeng Wang

PROJECT SUMMARY

Bogota is a popular desitination for bird watchers for its biodiversity. Birds are not only an essential part of the natural ecosystem but also an important indicator of the health of the urban environment. The proposal starts with remediation of the wetland ecosystem and completing the existing bird-watching facilities. Secondly, various campaigns are proposed to engage with community members to create stewardship. All these bird-oriented facilities and activities can become the seed to raise the awareness of the environment and the prompt the community to become stewards of their environment.





BOGOTA CITY CHANGE MAP

BIRD TO SEED THE CHANGE

The proposal is inspired by the existing birdwatching platforms within the wetland and bird lover communities which have the potential to drive and support community rejuvenation and simultaneously improve the ecosystem of the wetlands and the surrounding neighborhoods. Systems for cleaning the waste and making wetland edges into productive landscapes are introduced. Partnerships are also proposed between the community and local schools and organizations that can become stewards of the wetland and the bird habitats.











WETLAND IN BOGOTA



Colombia is the country with the highest number of bird species in the world, with more than 1,900 native and migratory species. And Bogota is the first city that has an urban wetland with the highest environmental certification in the world.

GLOBAL BIRD MIGRATION MAP

TARGET ISSUES

ENHANCE THE BIRD-WATCHING PLATFORMS AND CONNECT THEM TO THE COMMUNITY



Instead of setting up fences, local people want people to interact with the wetland, and learn about the wetland and also protect the birds.





UD STUDIO III - JABOQUE WETLAND

The existing bird-watching platform and the landscape boardwalks, which are a congregation points for bird lovers.



CONNECTING EXISTING FACILITIES

DOUBLE DISPLACEMENT AT THE WATER'S EDGE 91

PROPOSED FACILITIES



We investigated existing birds in our site; some live in open woodland or pasture, and some birds live in wet areas or shallow freshwater; while others live around shore and marshes.



Based on the bird-appearing locations and migration routes, we are trying to design a migration path for different kinds of birds by transforming the existing roofs into green roofs, then connecting them to form corridors.



By connecting existing green spaces and adding more, we want to form green corridors. Waste water from the community will be purified by proposed facilities, which also will become part of the bird watching tour.



We are trying to connect our bird-watching route with the original road and activate the public space by adding activities. We propose more trees along the road and renovation of the small community green spaces.



Our proposal starts with remediating the wetland environment and completing existing bird-watching facilities. We propose various campaigns to engage with community members to create stewardship. All these bird-oriented activities, will become the seed to raise the awareness of the environment and prompt the community to change.





By transforming and connecting the original spaces, we want to create a continuous green space that encourages locals to interact with the wetland, and also make the communities more welcoming for the birds.



We propose to add bird-friendly facilities such as artificial bird nests and mobile bird hospitals in these neighborhood parks and organize weekend workshops and distribute mobile apps, so residents can know more about Bogota's biodiversity and participate in rescuing wounded birds.









By proposing the regulations that promote a bird-friendly urban environments, we believe urban environments can be transformed to allow birds to live and thrive in human-centric spaces.

glass that allows light in



Turn out unnecessary lights at work and at home





UD STUDIO III - JABOQUE WETLAND

07 PRODUCTIVE WATERSCAPES

JUAN AMARILLO WETLAND

Strategies for Developing Productive Waterscapes and Inclusive Communities in Bogotá

TEAM

Mingrui Jiang Ruxuan Zheng Yan Huo Chongyang Ren

PROJECT SUMMARY

The edge of the Juan Amarillo Wetland and other wetlands of Bogota is not a static landscape. Rather it is a dynamic and productive place between wetland and community. Our project enhances this dynamic and productive edge, allowing residents to become the guardians of the wetland, protecting it through interaction and care in ways that work better than the fence that currently separates them. At the same time this edge can be cultivated for agricultural produce to enhance the community's economy. This reciprocity is an innovative working solution that generates benefits for both the wetland ecosystem and community.



SHRINKING WETLAND WITH URBAN SPRAWL



UNDERDEVELOPED WETLAND SURROUNDING AREA











Commuting takes >100 mins



SITE OBSERVATION NORTH SIDE



SITE OBSERVATION SOUTH SIDE



UD STUDIO III - JUAN AMARILLO WETLAND

DOUBLE DISPLACEMENT AT THE WATER'S EDGE **101**

DESIGN CONCEPT



Current Wetland≠ Static landscape Features



Weaving Connecting wetland and surrounding communities development



wetland benefit communities and stakeholder interests







AREA 1 SELF-BUILT SETTLEMENT



AREA 2 SUBA SETTLEMENT





AREA 3 WASTEWATER TREATMENT PLANT









I'm a resident of the neighborhood and there's no one here to take care of it, so there's always a lot of pumpkins, so I collect them and I can eat them myself or I can sell them to the market





I'm a community leader of the neighborhood. There is heavy illegal garbage dumping phenomenon. People drop massive waste around the wetland. **How to deal with** these waste becomes a serious

To beautify the environment and solve the waste issue, we have started to built community gardens with tyres as planters. We hope to have more legalized waste stations to protect the wetland.

There is no sign or activity space next to the wetland. It is just a large area of shrubs and aquatic plants. If you don't come in and pick up these pumpkins, they will soak in water and rot.

A star

There is no natural filtration along the water edge of Juan Amarillo Wetland. We need to renature water edge and educate people about the significance of the wetlan and ecosystem

AREA 1 SITE PLAN SELF-BUILT SETTLEMENT





UD STUDIO III - JUAN AMARILLO WETLAND

AREA 1 2023-2080 INTERVENTION SECTION







AREA 2 SITE PLAN SUBA SETTLEMENT







Food



UD STUDIO III - JUAN AMARILLO WETLAND

AREA 2 2023-2080 RETROFIT SECTION







2080

AREA 3 SITE PLAN EL SALITRE WATER TREATMENT









UD STUDIO III - JUAN AMARILLO WETLAND

AREA 3 2023-2080 IMPROVEMENT SECTION



2023

Drainage channel





Water treatment tank

DOUBLE DISPLACEMENT AT THE WATER'S EDGE 109

08 CITIZENS OF THE FOREST

BOSQUE CALDERÓN

Climate resilience through community stewardship.

TEAM

Ankita Sharma Rohin Sikka Sanya Verma Simran Gupta

PROJECT SUMMARY

Bosque Calderón lies at the base of the Eastern Hills of Bogotá at the intersection of the montane forests and the rapidly expanding city of Bogotá. The neighborhood is rich in biodiversity and under constantly growing pressure from both sides - real estate developers trying to move in and the community that is under a constant risk of landslides due to the degrading ecology.

This project works to redefine the ecotone between the city and the forest, with the community of Bosque Calderón at its core. The project re-envisions Bosque Calderón as a model biotic community, acknowledging the residents as citizens of the forest and granting them the agency to repair the ecology, the capacity to develop a symbiotic relationship with other species, and the legal rights to their land.



The neighborhood of Bosque Calderón is located at the edge of one of the richest biodiversity hotspots globally. These include the Andes mountain range and a complex set of ecosystems - the rapidly expanding city, the montane forests and the high altitude ecosystem of the Paramos, which is vital for the distinctive water system of Bogotá. With limited resources at their disposal the community is very resilient and has developed a number of self-organized systems. Almost 90% of the residents work in the construction industry and the neighborhood is largely made up of self-built houses.

The social bond between the residents is very strong but is now constantly being put to the test. Their land is under threat from real estate developers and universities who are trying to move in, and at the same time they are under a constant threat of landslides with the degradation of ecology and water depletion due to invasive species like the Eucalyptus. If nothing changes then very soon the Eastern Hills of Bogotá will be a conglomeration of large concrete structures with huge carbon footprints and a complete disregard for the ecology. To save the community is to save the forest.



LONGSTANDING COMMUNITY OF BOSQUE CALDERÓN THE CITY'S EDGE



UD STUDIO III - BOSQUE CALDERON





COMMUNITY AS THE 'SEED OF CHANGE'

The residents of this neighborhood truly are citizens of the forest. They belong here and have inhabited this land for generations. The elders reminisce about all the afternoons spent along the stream, hiking up the Eastern Hills and celebrating this ecosystem they call home.

RESTORE THE STREAM

The first strategy involves restoring the stream and the ecology. First, the community will regain their access to this fenced ecology. The houses near the stream are at a greater risk due to soil erosion, so rewilding will start with planting the indigenous Chuesque bamboo which is known for its soil holding capabilities to mitigate this risk. Work on the trail leading upto the Eastern Hills will also be initiated by the community.

In addition to holding the soil, Chuesque bamboo will be grown as a construction material which symbolizes the community's heritage in the construction industry. Native species like Quiche will be planted to purify the water and enrich the aquifers. As the stream recovers, it will yet again become a space where the community gets together to celebrate water and the association they have always had with this ecology.







REWILDING USING NATIVE SPECIES

DOUBLE DISPLACEMENT AT THE WATER'S EDGE 117

ACTIVATE THE NEIGHBORHOOD

As a part of the second strategy the ecology is integrated into the neighborhood fabric. The bamboo planted close to the stream will be used to build retrofit nurseries which will become green extensions of houses. People will then be able to come together in shared roof gardens and rewilded backyards. In addition to that, the open spaces will also be rejuvenated with similar bamboo structures further enhancing meeting opportunities and the already thriving social capital.

The residual public spaces and the streets will be rewilded and the concrete and the hardscaped areas transformed into more permeable surfaces. The existing underutilized community center will be rebuilt to provide more space for community and recreation activities and as the community grows and expands the ground level will start being used for small businesses and shops to sell locally sourced produce, both of which will work to activate the neighborhood and promote social interactions.











UD STUDIO III - BOSQUE CALDERON

CULTURAL PAVILIONS & TRAILS

ACTIVATING THE RESIDUAL PUBLIC SPACES

ACTIVATING THE STREET

SUSTAIN THE FOREST COMMUNITY

In the final strategy, the values cultivated through the reintegration of the community with the ecology will be extended beyond the neighborhood. As the community reconnects with the forest, it will expand the forest and blur the edges of the urban and natural fabric. The reintroduced trail will support eco-tourism in the neighborhood as the community becomes the steward of this gateway to the Eastern Hills. The seedlings nurtured in the nurseries, backyards and roof gardens will be taken to forests and the rewilding sites outside the neighborhood as the community of Bosque Calderón will become a model community for the ecotone between a city and the forest.

Just like Bosque Calderón, other settlements at the threshold of the city and forest in Bogotá can also use similar strategies to collectively celebrate Bogotá's rich ecosystem and biodiversity.











PRODUCTIVE LANDSCAPES FOR ECO-TOURISM

LOCAL PRODUCE MARKETS

GATEWAY TO THE EASTERN HILLS

CARTAGENA

Situated at the northern coast, Cartagena is a city surrounded by water. Main bodies include the Caribbean Sea, the bay, a swamp, Cienega de la Virgen, and canals. It has 74 km of water borders, and 88 km of combined primary and secondary canals for rainwater runoff.

DOUBLE DISPLACEMENT AT THE WATER'S EDGE 123

9

REPARANDO LA BAHIA DE CARTAGENA

MANGROVES + BIODIVERSITY

COMMUNITY BENEFIT

FISHING + LIVELIHOOD

WATER QUALITY

WASTE COLLECTION Canals

Cienaga de la Virgen

Cienaga de

la Virgen

Caribbean Sea



DOUBLE DISPLACEMENT AT THE WATER'S EDGE 125

09 CENTERING CARTAGENA

CARTAGENA, COLOMBIA

Healing biodiversity and livelihoods in tourism's wake.

TEAM

Deepa Gopalakrishnan Di Ngô Lê Jade Katrina Leann Durand María Gabriela Flores

KEY STATEMENT

Today, Cartagena de Indias faces an untenable growth of extractive tourism which leaves negative impacts on the environment and its communities. The Ciénaga de la Virgen - a critical part of the city's watery urban landscape that connects the Caribbean Sea, the Bay of Cartagena, and the canal network - is collapsing from pressures of urban expansion and climate change.

Like Cartagena's confluence of coastal tides and inland rains, our design exists at intersections of biodiversity restoration and celebration of intergenerational Afro-Colombian heritage that can support locals and tourists.

The project envisions establishing an amphibious housing armature, seeding ecological stewardship, reviving water mobility, and enhancing economic opportunities for locals.





DOUBLE DISPLACEMENT AT THE WATER'S EDGE 127

9



The Cienaga has gone through major landscape changes since 1776. This includes heavy infrastructure like Aeropuerto Rafael Nunez, La Bocana, and the Gran Manglar Viaduct, which have all caused the cienaga to choke over time.



The extractive tourism within the walled city heightens the collapse of the rest of Cartagena. The pollution produced from this extractive tourism severely affects the self-built communities of displaced locals and migrants along the Cienaga de la Virgen, who face the most risk with projected 2040 sea level rise.



situation that calls for urgent attention.

increases in tourism

Heavy infrastructure is effecting the Cienaga de la Virgen. Communities of both people and mangroves are being displaced, destroying a historically strong relationship between humans and nature. It is a

DOUBLE DISPLACEMENT AT THE WATER'S EDGE 129

Communities are fragmented by channels. Most people have never been to the beach or seen the Caribbean Sea.





women in our community are very entrepreneurial, we work with the youth and promote intergenerational transfer of skills and knowledge so they can become better leaders and manage their own communities



We worked with actors like Fundacion Grupo Social and Ecovida. During our visit to Cartagena, we witnessed the interchange of hard edges everywhere, from the oceanfront, to the system of concretized inner city canals, to the hard earth resulting from deforestation of mangroves at the Ciénaga. Houses turn their backs to water, and the underserved are pushed to the periphery. We recognize three seeds of change: the community, the mangroves, and adaptable and densified housing! We envision three policy frameworks to implement these seeds: a tourism tax that will go directly to the community for their ecosystem services, a community land trust, and empowerment of people.





DOUBLE DISPLACEMENT AT THE WATER'S EDGE 131

PHASING

Existing conditions within our pilot site show people living precariously on the water's edge, encroaching on the Ciénaga, and affecting the health of mangroves. Families claim space through an informal rule of law, rendering the edge of the ciénaga inaccessible. In the short term, we propose public elevated platforms, care for mangroves, water filtration, a small community hub, and a model amphibious house to establish trust with the community and show what is possible. Floating houses are a desire of local community partners we interacted with. Sleeping pods for non-extractive tourism can co-exist with an increase in amphibious housing, recognizing the need for a return to food production with farming and fishing according to seasons of rain and tide, akin to the ancestral practices of the Zenú indigenous peoples of the region.



Year 202 GRUPO SOCIAL GRUPO SOCIAL artestantes Ca



AMPHIBIOUS EDGE AND COMMUNAL LIVELIHOODS

The amphibious edge begins with the restoration of the mangrove ecosystem by expanding the existing nursery, and creating a community of environmental stewards. Healing the water of the Cienaga also envisions the dredging of the sediment-carrying canals. From our continued conversations with the community, we learned of their interest in floating houses, so we envision a model housing unit in 2023 with future opportunities for adaptation and densification. In 2035, the waters edge can transform into a soft public realm with a floating community hub as an anchor. Makerspaces and self governance areas, will bring the focus to communal skill development and local entrepreneurship. The amphibious housing can densify with opportunities adapted for inter-generational living. With a healthy mangrove population, in 2050, carbon data monitoring hubs and floating apiaries will be introduced.





NON-EXTRACTIVE TOURISM IN THE CIENAGA DE LA VIRGEN

The community will not only heal the cienaga but collaborate with the ecology by producing mangroves, continue to steward the ecosystem through youth education, and payment for ecosystem services. Ecotourism can thrive with tourist sleeping pods and sustainable boat tours which create a new form of regenerative economy for the community. The Cienaga de la Virgen is not at the peripheries. We believe that it is a place to experienced and not a place to be neglected. This pilot project can be the driver of change.

A prototype is proposed for communities to live with water along the Ciénaga, creating protection zones for mangroves and softening edges, as well as implementing strategic cuts to increase the original flushing of the salt and sweet water.





Mangrove forest Before urbanization UD STUDIO III - CIÉNAGA DE LA VIRGEN



Mangrove deforestation Current conditions



Mangrove planting Seeds on the ground



Payment for ecosystem services 2025





Future sea level rise **Eco-tourism** 2035 2050 DOUBLE DISPLACEMENT AT THE WATER'S EDGE 137

10 NEW CIRCULAR ECONOMY

CANALS AORUND CIENAGA DE LA VIRGEN

Restoration of vulnerable communities and natural environment through the new circular economy

TEAM

Changyup Shin

KEY STATEMENT

The communities settled in the South of Ciénaga de la Virgen are economically and environmentally the most vulnerable populations in the city of Cartagena. They lack basic infrastructure such as sewage systems, economic and educational opportunities, or means to improve their poorly self-built homes that regularly flood. Carelessly dumped trash in the canals reaches Ciénaga de la Virgen North, impacting its ecosystems.

The project proposal envisions alleviating the inequity for these communities by creating circular economy using waste management which can also provide jobs and education that can lead to addressing the environmental issues.



DOUBLE DISPLACEMENT AT THE WATER'S EDGE 139

9

COLOMBIA'S PATH TO SUSTAINABILITY

Mr. Petro, the president of Colombia recently showed his will to make the country more sustainable. To achieve his goal, the phase-out of the oil industry that the country is heavily dependent upon will be inevitable. However, many opponents to his direction believe this is too soon to reduce the petrochemical industry questioning if there is a substitute to balance the economic impact considering the fact that the oil revenues account for about 5th of government income.

In addition, the government has announced that, "Under its ambitious targets, Colombia will eliminate problematic and unnecessary plastics and transform all plastic packaging to reusable, recyclable or compostable formats. It will work to increase its plastic recycling rate to 50%, and the average recycled content of plastic packaging to 30%."

-Colombia launches second Plastics Pact in Latin America, https://wrap.org.uk/

0.1 TRANSECT OF MAMONAL (BELOW)

Petrochemical and plastics production located in Mamonal area are among the major industries of Cartagena. Reficar, the second largest refinery of the country owned by Ecopetrol, is located in this region.



0.2 TOURISM INDUSTRY (ABOVE)

With its geographical location near the Caribbean Sea, and historic architecture, tourism became one of the major industries of Cartagena. The number of foreign visitors to the city is more than 3 million per year.



0.3 UNDERSERVED COMMUNITIES (ABOVE)

While the government was focused on the economic development through Cartagena's two main industries mentioned above, the communities South of Ciénaga de la Virgen were left underserved for decades.





0.4 NEW CIRCULAR ECONOMY (BELOW)

In order to address the issues of the major industries and underserved communities, we can revisit the current waste management system to integrate waste into a new circular economy.

DOUBLE DISPLACEMENT AT THE WATER'S EDGE 141



0.5 VULNERABLE COMMUNITIES (BELOW)

Many of these communities are economically and environmentally the most vulnerable populations in Cartagena. They lack basic infrastructure as well as economic and educational opportunities.



0.6 POORLY SELF BUILT HOMES (ABOVE)

Many homes are poorly self-built. As many of them are located near the canals that often flood during the heavy rain season, They need means to improve their homes.



0.7 CANALS & CIÉNAGA DE LA VIRGEN (ABOVE)

The design proposal for these communities starts from constructing a trash collection outpost close to the The trash in the canals reaches Ciénaga de la Virgen, impacting its ecosystems. They are tied together and suffer from a lack of support from the government and existing canals. It will provide temporary jobs of trash picking for the locals who needs jobs. the hardship of these communities.



UD STUDIO III - CANALS AND CIÉNAGA DE LA VIRGEN





0.8 CANALS & CIÉNAGA DE LA VIRGEN (BELOW)




0.9 TRASH COLLECTIONDOLORE

When the majority of trash is removed from the canals and they meet minimum required water quality, the Mangrove nursery will promote Mangrove planting with the help of locals. The Mangroves can be planted along

the canals to maintain water quality, increase biodiversity, and prevent flooding.



UD STUDIO III - CANALS AND CIÉNAGA DE LA VIRGEN

10. STRONG COMMUNITIES

Trash picking, crafting with recyclable waste, Mangrove planting, and the effort to maintain the natural environment will bring the lost biodiversity and the finishing job back to the community.

Improved incomes will provide home improvement opportunities for locals.

The education of ecosystem stewardship will provide opportunities to have contracts with hotels in return for tenure when the commercial investment reaches these communities due to the expansion of the tourism industry.

CALI

Located within the Cauca Valley between the Central and Occidental Cordilleras lies the 'city of seven rivers', Santiago de Cali. Established as an agricultural hub for the country and a strategic site for trade and export, Cali's colonial legacy has materialized through spatial segregation and exclusion of vulnerable communities toward the periphery of the city, within the hillside in the west and former wetlands in the east.



JUSTICIA DEL AGUA PARA CALI





Los Campos



11 TERRENOS DE AGUA

FOOTHILLS

Holding water at Cali's highest frontier through networks of eco-stewardship, hydro-social care and resilience.

TEAM

Anagha Arunkumar Anchalinad Anuwatnontaket Devanshi Pandya Vir Shah

PROJECT SUMMARY

Across ecological and social frontiers, our project centers current and future ways of living and moving with water.

Reforestation, large scale upstream water reservoirs and capacity building within the community are our major tools. Over time, policy-protected and incentivised communal stewardship will generate a stabilized, rewilded landscape for ecological resilience and socio-economic opportunities.

By creating spaces to clean, hold and absorb water throughout the settlement, we can regulate ground water. Waste management infrastructure will encourage sustainable habits around waste and water. At the frontier between the 'formal' and 'informal', softened landscapes will privilege pedestrian activity to lower social and infrastructural barriers.

The proposal will evolve over time to strengthen the eco-hydro-social networks that will redefine life in selfconstructed settlements across Cali.

UD STUDIO III



WATER ACROSS TERRAINS



A drop of water that emerges from the ground, condenses and flows through the rocky mountains of the Andean ranges. In its journey it grows as it is filled with life; forming rivulets, leading to a stream and finally culminating in a rushing river, leaving peaceful pools and waterfalls in the higher altitudes.

Hillside settlement density

Foothill settlement density

4100M

3300M

Canal 900N Formal settlement density

The hillside fringe settlement is caught between ecological and urban forces. Both residents and water are forced to negotiate their survival.

Floods are a form of water trying to erase demarcations imposed upon nature. In ^{2000M} exploring opportunities here, the contested waterscape is reimagined to retain, absorb 1050M and infiltrate.

By augmenting existing hydro-social networks, we constitute new ways of being and celebrating to both envision new possibilities for the ongoing future, and reframe articulation of the past and present.

CALI CITY



ΟΟ STUDIO III - FOOTHILLS

PEOPLE AND PLACE

Our proposal identifies and builds upon the existing network of flood response and resilience, in collaboration with inhabitants and other stakeholders.



HOLDING WATER IN THE FOREST



Over time, the hillside will be reforested with local species of flora, stabilizing the soil. Water will be held, filtered and absorbed into the ground in contour trenches and bio-reservoirs.







UD STUDIO III - FOOTHILLS

REFRAMING THE WATER COMMONS





INTERVENTION AT WALLED CORNERS



INTERVENTION AT WALLED CORNERS

thus uncovering the stream.

DISSOLVING THE SEAM



The highway, currently a physical barrier between formal and informal, will transform into a green-priority social corridor with self-constructed incremental live-work housing.







12 CALLES PARA CALI

STREETS

Events based program transforming Streets of Cali to prevent future displacement by directing water flow.

TEAM

Aashwita Yadav Oréoluwa Gift Adegbola Sanah Mengi Yashita Khanna

PROJECT SUMMARY

Our project envisions events as our seeds of change. We use an events calender to direct the design of the Streets of Cali. With water flowing from the highlands of Siloe to the foothills of river Cauca, our events expand the street infrastructure by enhancing the presence of water in the city fabric and celebrating culture in the streets. Our events based program aims to prevent future displacement by directing water flow and slowly dissipating it into the Cauca river.

The events calendar is curated to allow events to gradually take over the streets of Cali, transforming the city of Cali by holding water in its streets while simultaneously celebrating the culture and festivities.







PROBLEMS NOTICED ON THE STREETS

Even though the city is extensively vibrant, the streets These impermeable streets, socially and ecologically lack interactivity. They lead to experiences of exclusivity together render the streets of Cali unsafe. and inaccessibility. There is extensive infrastructure that

socially divides the city due to its unapproachable water Our roadmap to implementation expands the Cali Fair bodies, and car-oriented design. into a City wide event.



Honing on to the power of culture, salsa, and festivals in Cali, we designed our own Festival Calendar for the City of Cali, extending existing events and developing newer ones throughout the year.



La Feria de Cali - Cali Fair - December La Feria de Flores - Flower Festival - March Fiesta de la Cosecha - Harvest Festival - April La Ferria de Graficalia - Street Art Festival - July Social Ciclismo Event - Social Cycling Circuit - August La Feria de Agua - Water Celebration - November

CITY CENTRE - LA FERIA DE CALI / CALI FAIR

In the last week of December, Cali is used to closing the year in style, when the Cali Fair offers the best rumba show. One more year Cali reminds us why it is known as the famous "capital of salsa". Are you ready to dance salsa?









THE HIGHWAY DURING THE SALSA FESTIVAL AT NIGHT





NUEVA GRANADA - FERIA DE LAS FLORES / FLOWER FESTIVAL

Flowers are one of the main exports of Colombia. The Flower Festival is celebrated during the main flower season in the region. You can enjoy a classic car parade with lots of old but stylish cars in good condition. Besides, there is folk music, dancing, and tasty traditional food drinks. The festival is full of different activities like impressive concerts and pagan parades!



UD STUDIO III - STREETS OF CALI



SECTION BB - STREET SECTION THROUGH COMMERCIAL AREAS



THE INNER ROADS DURING THE FLOWER FESTIVAL



LAGUNA DEL PANDAJE - LA FERRIA DE COSECHA / HARVEST FESTIVAL

The harvest festivals, which are held during April, are the birthday celebration of this great city. These festivals are held all around the city, beginning with a horse back ride that takes place along the main streets. There are fairs and parties at the neighborhoods outside the downtown area and the main squares, all this with the intention of making the whole city a big celebraion.



UD STUDIO III - STREETS OF CALI





RESIDENTIAL STREETS DURING THE HARVEST FESTIVAL





UD STUDIO III - STREETS OF CALI

13 AGRICULTURE AS INFRASTRUCTURE

FIELDS

LOS CAMPOS: Water Holding Across a Broad Geography

TEAM

Haoyu Hu Yue Huang

Tippi Huang

PROJECT SUMMARY

We see Fields as the seeds of change that will form a new flood resilient infrastructure in Cali, and our goal is to create "multiple amphibious cities" to create a more diverse and resilient urban landscape for Cali. The project aims to transform sugarcane monoculture into diversified agriculture that heals the soil, empowers farm workers, diversifies incomes, and creates decent employment opportunities for them. We proposed green corridors along the Cauca River and excavating river channels to mitigate flood risk. At the same time, new industries, such as aquaculture and tourism, will be introduced to promote a blue and green economy where communities can also be paid for managing biodiversity ecosystems. From 2023 to 2050, we envision a more livable, socioeconomically inclusive and environmentally sustainable Cali, with a special focus on nature-based infrastructure and biodiversity conservation, which will ensure a more sustainable and resilient future for the city in the face of climate change.



SUGARCANE, FIELDS, RIVER

The overflow of Cauca River and the rupture of the Jarillón has long posed a risk for local residents and this risk separates the sugarcane farmland from the urban fabric.



LEGACY OF SLAVERY IN CALI

CULTURAL AND FOOD HERITAGE

Cali's sugarcane implies a huge cultural footprint and the variety of crops are as

ECOLOGY	EC
 Water-holding Infrastructure Farm lands to also serve as infrastructure for water holding. Diversified Agriculture Transform monoculture into diversified agriculture to improve soil health by crop rotation. 	 Cooperative To build cooperative agronomist, enterperender skills. Renewable Strengthen food prediction to agricult
• Forrest Corridors by Agroforestry To pursue biodiversity by integration of trees and shrubs into crop and animal farming system.	 Diversify E Opportunit Empower v
	and the second second





much a part of Colombian food, culture and tradition as they were in the past.

CONOMY

ve Ownership of Farmland es between the universities, ises and farmers by offering

Agro-industry cessing industries for value iral produce.

conomy, Create Job

vomen with paid jobs

CULTURE

• Nurture Afro-Colombian Heritage

• Promote AgriTourism and Cultural Tourism

To grow sustainably, sell locally made goods at a weekly organic market, and offer popular ecotours and accommodations at their farms.

 Promote Traditional Foods Boost the bio-cultural richness to understand gastronomy as an engine of social and cultural development in Cali

Sugar mills & sugarcane processing plants

THREE PHASES







CONNECT

- Stitch the East and West of River Cauca together
- Connect the historic ox-bows to the river

STRAGETIES ON SITE

- ACTIVATE Activate the ox-bow connections to
- Create agro-forestry corridors in the city to improve water holding and food access

Access Routes & Bridges

LEVERAGE

- Leverage cultural tradition for tourism
 Connect farm cooperatives to national supply chains

Crops Rotation & Cali Gene Pool

River Transportation

Biodegradable Bagasse Buildings



Food Processing Industries for Value Addition to Agricultural Produce

(PIL) Restaur

Primary Agricultural Products Processing





Agritourism with Multiple Experiences







STRATEGY MAP

WATER HOLDING ACROSS A BROAD GEOGRAPHY

SECTION BEFORE & AFTER



During the rainy season and flooding, the river area will increase and hold more water, which will greatly reduce the impact of flooding on cities and towns. independence can be achieved through urban design towards decarbonization, economic diversification, and riverside resilience.



UD STUDIO III - FIELDS

AXON DETAILS DEVELOPING

EXPANDING CALI TO AGRITOURISM

As a tourist destination, Cali offers a variety of experiences. This map shows our ambition to combine production, tourism, farm-to-table dining, education and academic research for expanded tourism opportunities.

TRANSFORMATION1: FUTURE FARMLANDS OF EQUITY AND PROSPERITY

REGENERATIVE AGRICULTURE, REDUCED FLOOD RISK AND ROBUST ECONOMY

Ultimately, our project will strengthen the riverbank, improve the environment, bring considerable green space, job opportunities and economic benefits.

UD STUDIO III - FIELDS

TRANSFORMATION2: AGRO-INDUSTRIES FOR DIVERSYING ECONOMY AND JOBS

2023 CALI BEFORE TRANSFORMATION

2050 CALI AFTER TRANSFORMATION

We hope to mitigate soil erosion and flooding, as well as bring about economic, ecological and cultural development, which will effectively prevent flooding in

Cali and diversify agriculture to create more job opportunities by introducing water-holding infrastructure across a broad geography.

UD STUDIO III - FIELDS

14 RIVER CULTURE IN CALI

RIVERBED

Leveraging Urban Pacific river culture to increase access to the river and promote collective governance and stewardship of water ecosystems.

TEAM

John Max Grunewald Naumika Hejib Verena Krappitz Caroline Wineburg

PROJECT SUMMARY

Our project embraces the long legacy of river culture in Cali of Urban Pacific communities and proposes strategies to leverage this culture to counter cycles of injustice and build community capacities with productive urban waterscapes. By bringing equitable access at strategic locations along the Cauca River, we challenge the land use of the 30 meter setback to strengthen communal land rights for Afro-Colombians living in the riverlands and reward care for critical ecosystems. By connecting existing waterways, we propose retrofitting strategies for housing for future climate adaptation and weaving social, ecological, and hydrological systems within the existing urban fabric. We envision a scalable, resilient framework for communities to expand river culture in Cali.

Los Urbanos Pacificos

River or water culture in Cali is influenced by its proximity to the Pacific coast and extends throughout the valley. The Cauca River receives water from two mountain ranges, Cordillera Occidental and the Cordillera Central, creating a complex hydrological cycle. Valle de Cauca, which extends between the mountains, is influenced by the global weather phenomena El Niño and La Niña, increasing periods of drought and intensifying heavy rainfall as temperatures rise.

Environmental and land use policy in Colombia can be utilized to secure protections for river communities and habitats. DECRETO 2811 from 1974 declares waters are inalienable in the public domain, and specifically demands a thirty meter set-back zone from rivers in order to protect the water. Land tenure is currently protected by Colombia's Ley 70 from 1993, which aims "to establish mechanisms for protecting the cultural identity and rights of [Afro-colombian] Communities as an ethnic group and to foster their economic and social development" (Ley 70). These two land use laws provide the political grounding to reimagine land use policy in

the 30 meter setback through collective cultivation and governance, redressing existing power asymmetries.

During the six decades of Colombia's civil war, Cali became a receptor for Internally Displaced people, largely Afro-Colombian communities from surrounding regions near the Pacific Ocean. An acute housing crisis unfolded as new residents were excluded from the formal housing market and settled in high risk areas along the water's edge, areas with features and economies familiar to their coastal hometowns.

Heavy flooding in 2011 resulted in the city's proposal of Plan Jarillon which led to further forced displacement of residents living in between the levee and the river. These disruptions of livelihoods and social bonds lead to increased vulnerability for marginalized communities.

In order to break the cycle of injustice, we propose strategies to provide access to the river, connect water bodies across the city, and rebalance power dynamics to benefit riverine communities.

Archival Photo of Cali river culture UD STUDIO III - RIVERBED

Site photo of Cauca River access, breaking Cali's cycle of injustice geomorphology of Valle de Cauca

Cordillera Occidental

Placa Continental

Oceano Pacifico

View of future river culture

2080 Access Plan

Interior View within Access Point

ACCESS THE RIVER

With the implementation of ecologically-restorative practices along the river embankments, the surrounding soil will be strengthened, lessening edge erosion. By initiating wetland restoration and permaculture, the river's edge will begin to expand as native vegetation grows to support nesting habitats for birds and fish, while filtering and improving water quality.

Floats, piers and access points will be built with empirical, place-based knowledge. By diversifying water holding landscapes, this lessens the burden on infrastructure, like the Jarillon, to provide the sole source of flood protection. The access points are connectors, infusing River Culture further inland providing equitable access.

River culture is expected to expand into everyday life from the access points, allowing for a diverse range of programs determined by and for the community (from community agriculture, technology hubs, resource + knowledge exchange, and social services.)

We proposed funding streams from The Water Security and Sustainable Development Hub and the Secretaria de vivienda social y habitat to support these activities for community based organizations like el Colectivo de Mujeres Pazificas de Cali. The Center for Research on Sustainable Agricultural Production Systems, or CIPAV can provide additional funding to further promote permaculture practices and payments for ecological services.

UD STUDIO III - RIVERBED

Access Point on Jarillon Section View

CONNECT WATERS

With our next strategy to connect waters, we propose bringing river culture further into the city, by broadening the ecological zones around existing canals and green belts, aggregating productive waterscapes for capture and filtration, and adapting housing in place for future climate resilience.

As the city was urbanized, rivers and channels were built to regulate the flow of water. Connect waters remembers the dynamic water landscape which was once abundant with cienegas when the entire flatlands were saturated with water. Cali's water bodies have become disconnected, behind levees and walls, while communities are further marginalized in the periphery and exposed to higher risk as the city grows into the river lands.

By bringing the water in, the public will benefit by the broadening of socio-ecological zones, closely tying commercial and ecological corridors, and beginning to adapt the urban fabric for water collection and filtration functions. To retrofit housing for future flood events, critical living functions are moved up to the first floor, utilizing the ground level for commercial spaces and workspaces. Flexible and self adjustable housing modules provide a scalable, resilient framework for communities to densify on their terms and based on their needs. Through Cut and Fill Terrain Changes, critical infrastructure will be strengthened while new ecology zones thrive. The renatured waterways and agroforests will increase the absorbancy level of the ground and expand within the urban fabric.

View of Permeable Commercial Plaza

2080 Connect Plan

Housing Densification Section View

REBALANCE POWER DYNAMICS

Water in Cali has historically been an element of social and spatial segregation. By accessing the river and connecting the waters, the dynamic river will be transformed back from its intermediate state as a controlled river into an expansive landscape of water and urban fabric. The Water Justice Council, created through a coalition of community, governmental, academic, and environmental stakeholders, will empower community councils and river stewards through collective governance to rebalance power dynamics. Reflecting on the possibility for the regional expansion of river culture across the entire Cauca Valley, water's potential is recontextualized, not to divide but to strengthen communal and ecological bonds for a more just and resilient future in Cali.

WATER JUSTICE COUNCIL

LOCAL **STAKEHOLDERS**

GLOBAL RESOURCES

Transect + Stakeholders

HOUSING JUSTICE

AFRO-COLOMBIAN RIGHTS ORGANIZATIONS

COMMUNITY

COUNCILS

ASSOCIATION OF DISPLACED NATIONAL CONFERENCE OF AFRO-COLOMBIAN AFRO-COLOMBIAN ORGANIZATIONS

• AFRODES

HOUSING PROGRAMS

ACADEMIC PROGRAMS

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SUSTAINABLE DEVELOPMENT

ECOSYSTEM RESTORATION

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CENTER FOR RESEARCH ON SUSTAINABLE AGRICULTURE

INSTITUTE

TOWARDS POLICY, IMPLEMENTATION & CLIMATE JUSTICE ACTION

COLUMBIA CLIMATE SCHOOL, CLIMATE AND SOCIETY

BACKGROUND

Alongside the Water Urbanism Design Studio, the Columbia University Climate School course "Imagining Climate Resilience and Justice," explored climate justice and action through a lens of policy making in support of communities and ecologies on the frontlines. Their work of research, case studies and policy, and synthesizing learnings and dilemmas, linked to the Urban Design Studio through recommending a set of principles and actions that helped guide and test urban design concepts and implementation strategies.

The following policy and enabling environment recommendations were developed in partnership between GSAPP Urban Design and Columbia Climate School students as well as local partners on the ground. They are intended to synthesize what we heard, the challenges shared with us, and the opportunities uncovered to support seeds of change on the frontlines.

They also offer a path for advancing Climate Justice and Action at Columbia University.

SEEDS OF CHANGE

What if Cartagena's blue economy development plans prioritized communityled initiatives and ensure equitable access to resources?

Karl Greenfield, Margaux Alfare

What if housing priorities and funding centered on climate risk and vulnerability? Juliet Tochterman, Katy Zack

What if loss and damage accounted for the climatic and cultural elements that have been subjected to legacies of ecocide, enslavement, and colonialism? Josh Nodiff, Patrick Beckley

What if care, wellbeing, and mental health were legitimately valued as ecosystem services provided by Colombia's critical ecosystems?

Pria Mahadevan, Jaad Benhallam

What if there was a symbiotic relationship between top-down international and national actors and bottom-up community climate adaptation?

Hailey Basiouny, Georgia Monaghan

TOWARD A REGENERATIVE ECONOMY

TEAM

Karl Greenfield Margaux Alfare

KEY STATEMENT

Colombia has vast natural capital, but faces significant environmental and economic challenges. Half of Colombia's households face food insecurity despite its rich agricultural lands. Recent economic policies--such as reducing dependence on fossil fuel and expanding public purchase of local goods-are helping to build a sustainable and regenerative economy. A regenerative economy is one that creates wealth and wellbeing while also restoring and enhancing natural systems. Investment in the regenerative economy flows to local efforts where local goods are produced, waste is recycled and landscapes are transformed and protected. Public subsidies to spur the regenerative economy can come from taxes on extractive industries. For example, a tax on AirBnB could help to fund mangrove reforestation and local eco-tourism operators in Cartagena. There are also emerging financial vehicles such as carbon markets and nature bonds, for which local regenerative economy entrepreneurs in Colombia will be well positioned.

WHAT IF CARTAGENA'S CURRENT COASTAL MANAGEMENT POLICIES AND PRACTICES PRIORITIZED COMMUNITY-LED INITIATIVES TO PROMOTE AN EQUITABLE DEVELOPMENT OF THE CITY'S BLUE ECONOMY?

KEY OUTCOMES

- Maintain continuity of existing blue economy initiatives
- Taxation and distribution of funds to create a sustainable blue economy
- Establish a governance framework, finance alone is inadequate
- Develop a transparaten, standardized framework for national blue carbon projects

GLOBAL

- Offer no-interest loans for blue economy projects, some of which may be converted into grants
- Strengthen the capabilities of non-profit organizations and local governments to guide the rulemaking of Article 6.4 of the Paris Agreement, which deals with international carbon markets, appears critical
- Increase efforts for the adoption of a ban on deep-sea mining, which could have significant negative consequences on marine ecosystems

NATIONAL

 Implement an Airbnb tax as a way to generate revenue that can be used to fund local infrastructure projects, such as the development of public transportation, better waste management systems, and local environmental conservation projects

- Push for the construction of an internal carbon credit market, where the credits would be assessed by the Colombian government and sold exclusively to Colombian corporations.
- Advocate for the development of a Caribbean-wide blue economy strategy, thereby ensuring that sustainable tourism principles are adopted by other nations in the region
- Increase investment in local universities to facilitate scientific analysis of Colombia's path forward regarding carbon and biodiversity

LOCAL

- Shift away from traditional approaches to beach replenishment, which has had negative impacts on the marine and coastal environment
- Implement more restrictive building codes for coastal development to preserve natural habitats and prevent coastal erosion
- Develop localized financial and policy mechanisms that prioritize restoration and conservation efforts
- Increasing connections via public services and public transit to poorer communities to promote greater social equity
- Promote non-partisan scienceinformed coastal management, as it allows decision-makers to make informed choices about resource allocation and environmental rehabilitation

TOWARD A REGENERATIVE ECONOMY

What if Cartagena's current coastal management policies and practices prioritized community-led initiatives to promote an equitable development of the city's blue economy?

READ MORE: POLICY MEMO FINAL PRESENTATION

TOWARD HOUSING JUSTICE

TEAM

Katie Zack Juliet Tochterman

KEY STATEMENT

Colombia has vast natural capital, but faces significant A right to housing is enshrined in Colombia's constitution; but safe, affordable housing remains out of reach for millions of Colombians. The civil war, narco-terrorism, and refugee crisis have all contributed to widespread housing insecurity. When people who have been displaced by war or other trauma settle on land, they often find themselves facing a new set of perils, such as flooding, landslides, and political marginalization. National laws have protected the rights of Afro-Colombians and Indigenous peoples to ancestral lands and community self-determination. Many people in government and civil society in Colombia are working to help these communities build resilience and political power to have a voice in their future. Local governments are also working to provide more housing opportunities especially for those most in need. This has been done directly through social housing and through zoning and incentives for equitable growth. There are many lessons from the experimentation in social housing in Colombia, but a few that rise to the top are a need to ensure transparency and accountability in the development of social housing, raising standards for construction to future climate conditions, and building capacity in local governments to enforce regulations and build lasting partnerships with communities facing housing insecurity.

WHAT IF HOUSING PRIORITIES AND FUNDING **CENTERED CLIMATE RISK AND VULNERABILITY?**

KEY OUTCOMES

- Standardize and legitimize land rights of displaced people in the context of their social and climate ris
- Support empirical housing as an interactive process that enables local vernacular and non-homogenized housing
- Redefine housing 'invasions' as communal solidarity
- Acknowledge the historical legacy of colonialism and past/current systems of corruption
- Assure any new housing is built to a standard that takes into account long-term climate projections

GLOBAL

- Transparency and protection of anti-corruption activists working on exposing illegal and corrupt real estate transactions
- Ratification of International Covenant on Economic, Social and Cultural Rights
- Communication between national and local actors and programs

NATIONAL / REGIONAL

- Funds to fully implement already existing laws/policies that address housing and economic inequalities
- Reform Colombia's Law 70 and/or the Colombian Housing and Habitat Law by including Community Land Trusts as a legal mechanism for obtaining land rights/titles

- Technical and financial assistance to local municipalities in order to incorporate socio-spatial planning of sustainable and equitable, climate adapted housing
- City governed account for anticorruption activities and honest government standards
- National scale land tenure assessment to understand and bring transparency to land holding across the county

LOCAL

- Transparency and protection of anti-corruption activists working on exposing illegal and corrupt real estate transactions
- Ratification of International Covenant on Economic, Social and Cultural Rights
- Communication between national and local actors and programs
- National and local policies/programs through Loss and Damage funds in order to fulfill international commitments

To focus on creating the foundations necessary to amplify the voices of vulnerabilities, allowing them to create their own solutions for economic, social, and environmental justice

READ MORE: POLICY MEMO **FINAL PRESENTATION**

TOWARD A JUST TRANSITION

TEAM

Josh Nodiff Patrick Beckley

KEY STATEMENT

Colombia has vast natural capital, but faces significant A right to housing is enshrined in Colombia's constitution; but safe, affordable housing remains out of reach for millions of Colombians. The civil war, narco-terrorism, and refugee crisis have all contributed to widespread housing insecurity. When people who have been displaced by war or other trauma settle on land, they often find themselves facing a new set of perils, such as flooding, landslides, and political marginalization. National laws have protected the rights of Afro-Colombians and Indigenous peoples to ancestral lands and community self-determination. Many people in government and civil society in Colombia are working to help these communities build resilience and political power to have a voice in their future. Local governments are also working to provide more housing opportunities especially for those most in need. This has been done directly through social housing and through zoning and incentives for equitable growth. There are many lessons from the experimentation in social housing in Colombia, but a few that rise to the top are a need to ensure transparency and accountability in the development of social housing, raising standards for construction to future climate conditions, and building capacity in local governments to enforce regulations and build lasting partnerships with communities facing housing insecurity.

WHAT IF LOSS AND DAMAGE ACCOUNTED FOR THE CLIMATIC AND **CULTURAL ELEMENTS THAT HAVE** HAVE BEEN SUBJECTED TO LEGACIES OF ECOCIDE, ENSLAVEMENT, AND **COLONIALISM?**

KEY OUTCOMES

- Uproots the legacies of ecocide, enslavement, and colonialism that uphold the climate crisis
- Reinvests funding toward climate solutions that center the leadership, voices, and visions of Afro-Colombian communities
- Institutionalized democratic mechanisms for community and participatory engagement planning, design, research, and governance
- Reimagines coastal restoration as integrated within the sociocultural, economic, ecological, political, and architectural fabric of urban life
- Celebrates resilience, joy, community, and culture with regenerative economies of care

GLOBAL

- Establish an international compensation commission to receive claims from Global South countries and equitably disburse climate reparations funded by Global North countries, such as the Barbados climate mitigation trust
- Amend the Rome Statute to codify "ecocide" as an international crime, litigate against multinational corporations found liable for ecocide, and recoup money won as compensation for loss and damage, such as Chiquita
- Cancel all neocolonial debts and ensure that reparations are disbursed as grants and not loans; Transform the global financial system by uprooting regimes of neoliberalism and neocolonialism upheld by IMF and World Bank
- Pursue a Global Green New Deal involving the just transition away from fossil fuels, including the decarbonization of the cruise and mineral extraction industries
- Develop practices aligned with the "International Decade for People of African Descent, 2015-2024". UN platform celebrating contributions made by people of African descent, tasked with stopping discrimination and promoting inclusion

NATIONAL/REGIONAL

- Establish a federal loss and damage agency that redistributes funding to regional resilience programs devised by Afro-Colombian county advisory groups and create a Afro-Colombian/ Indigenous community credit union
- Develop Extended Producer Responsibility (EPR) mechanism funded by tourism/commodities trade to support underserved communities. Generated funds can go to community efforts
- Reform Law 1931, management of climate change to support reforestation and ecosystem services
- Createguidelines for the management of climate change applicable to both, public and private entities.
- Establish a national mechanism for receiving payments for ecosystem services and quantify the value of these services in relation to its "highest and best use."
- Develop a financial vehicle that assures those payments go directly to the communities stewarding them.
- Reform Colombian Economic Growth Law, 2019 — "exempt income" for socalled "Orange Economy" activities (income from the development of technological value-added industries and creative activities, for a term of seven years, provided that some requirements are met)
- Reform Law 1448 2011: Victims and Land Restitution Law - return illegally held land to its rightful owners. Eliminate hierarchy of victims in which eligibility for reparation depends on the date when the abuses were carried out. Include Afro-Colombian lands in national protected areas

Resolution 181 - 2013: Designed to prevent land grabbing in the future. It helps new landowners properly obtain titles and registration documents to ensure that land cannot be illegally taken or abused.

LOCAL

- Create a Public-Private solution for 3rd party digital chain of custody system to track growing trees and display mangrove growth status to support reforestation using public capacity and private innovation and capital
- Improve Anti-Discrimination Law 2011, which levies prison sentences for acts of discrimination on the basis of ethnicity, race, gender, sexual orientation or nationality by aligning with aspects of USA Crown Act - "Creating a Respectful and Open World for Natural Hair"
- Establish county advisory groups for participatory governance on: Providing safe and affordable housing, jobs, entrepreneurial pathways, Providing access to essential services such as healthcare, education, and transportation; Creating a sense of community and belonging; Creating public spaces that are designed to be welcoming. The advisory group would: Strengthening the tie between educational policy and guidelines with the overarching National Development Plans and National Decennial Education Plans. The Ministry of Education should co-develop and enforce regional and local policies that align with national policy

TOWARD A JUST TRANSITION

What if loss and damage accounted for the climatic and cultural elements that have have been subjected to legacies of ecocide, enslavement, and colonialism?

READ MORE: POLICY MEMO FINAL PRESENTATION



TOWARD CARE AND STEWARDSHIP

TEAM

Jaad Benhallam Pria Mahadevan

KEY STATEMENT

Currently wetlands and other critical ecosystems are not fully valued for the services they provide - water filtration, flood mitigation, biodiversity. They also provide stewardship opportunity and bridging the gap between people and their relationship with nature. For a long time, women's work and care has not been valued , but there is a revolution around this and Bogota is leading the way - reimagining how care can be a service that's provided by the wetland itself, and that caregivers are key agents of change in this system. Meanwhile, housing and ecosystem services and conservation are at times in conflict with one another when marginalized and displaced people settle in wetlands and other sensitive areas, such as coastal mangroves. Through scaling of care systems, one might imagine that there could be strong local governance and decision making around payments for ecosystem services that might be used for any number of community-based services or infrastructure needs to support these communities or offer structures and resources to move out of harm's way.





KEY OUTCOMES

- Reform the local political system to decrease high turnover
- Leverage the value of ecosystems through a framework of care – which has already been used to support and elevate certain marginalized actors in society.
- Empower caregivers to lead local environmental stewardship
- Train and fund women to create local networks of environmental guardianship that allow for rehabilitation and growth of target populations (men, at-risk youth, formerly incarcerated, etc)

GLOBAL

- An emphasis on bottom-up, community-led approaches to environmental care and biodiversity protection is missing on a global scale. To address this, a portion of the incoming Loss and Damage fund and/ or other sources should be directed towards supporting payments for ecosystem services in biodiversity hotspots.
- At an international level, financiers for PES could include: the Green Climate Fund and future Loss & Damage allocations. Private sector donations and commitments to net-zero would also be applicable for scaling payments.

NATIONAL

- Use scaled-up local initiatives like Mujeres que reverdecen to strengthen local biodiversity, and leverage the flexible nature of Colombia's PES laws/guidelines to pursue private partnerships and/or direct private funding towards new and existing PES schemes.
- Within the existing national legal structures, the PES law (Law No. 870, 2017) would be a logical first step to set up the framework for care-based PES. To ensure success, a compatibility assessment around this law and its application to mental health/wellbeing/care would need to be performed.

LOCAL

- Funding and expanding Mujeres que reverdecen through payments for ecosystem services within a care framework, creating pathways for more at-risk members of society to engage with nature as a means towards both rehabilitation and enhanced ecosystem services.
- The initiative begins at the local Bogotá level, where the care blocks are already part of the recently implemented territorial master plan. The critical ecosystems of Bogotá, such as the wetlands, are sites for piloting. The program can then be expanded nationally, to include other fragile yet crucial ecosystems (i.e., mangrove, rainforest, páramos).

TOWARD CARE AND STEWARDSHIP

What if care, wellbeing, and mental health were legitimately values as ecosystem services provided Colombia's critical ecosystems (wetlands, mangroves, paramos, etc.)?

READ MORE: POLICY MEMO FINAL PRESENTATION



TOWARD COMMUNITY-LED STEWARDSHIP

ΤΕΑΜ

Georgia Monaghan Hailey Basiouny

KEY STATEMENT

Climate, social, economic, and cultural risks are deeply intertwined, particularly as it relates to urban wetlands in Bogotá. Wetlands are critical to climate resiliency, hotspots of biodiversity, carbon sequestration, water filtration. Those most vulnerable to climate change also possess deep commitment to responsibilities of caring for the wetlands. Meanwhile, communities are double or triple-displaced from violence, conflict, infrastructure, or other risks with little to no choice but to live in crowded informal settlements around these wetlands at at increased climate risk. Without resources, including funding and time, they are essentially expected to protect the wetlands they may be entirely new to understanding and valuing. Climate justice in Bogotá depends upon community leadership and co-stewardship of its urban wetlands and is path towards sustainable projects and governance that assure the environment and people coexist and grow.

While many policies and projects at global, national/ regional, and local scales are wholly or partly dedicated to the restoration and protection of wetlands, policy gaps stem from (1) funding that flows to well-established international institutions, not least because of corruption that remains a challenge across scales of government within Colombia, and (2) existing socioeconomic, cultural, and structural barriers that reduce the abilities for local Bogotáns (and Colombians more broadly) to ensure wetlands are protected, healthy, and able to flourish as flood management solutions.



KEY OUTCOMES

- Trust-building, particularly with local Indigenous communities who should only be asked to share knowledge if their needs are heard
- Deep and long-term relationships over connection and accessibility, for both communities and nature.
- Multi-stakeholder processes as well as sustained engagement at every stage even when not everyone will be satisfied with every decision
- Foster nature, community and belonging - if 'Bogotá belongs to everyone, it belongs to nobody'
- Ensure value is measured holistically, accounts for community perspectives of what 'value' means and includes typically unaccounted-for values (care, time and nature)
- Embed accountability mechanisms to counteract corruption, mismanagement and maladaptation; pursue accountability through reparations to hold institutions accountable for past and current harms

Inspired by New Zealand's Waikato River Clean Up Fund, Bogotá's Care Block system and a number of other community-led climate frameworks, we propose Bogotá develop a Bogotá Care Fund (WRA, 2021). The objective of the Fund is to be a vehicle which connects top-down actors with bottom-up initiatives by directing international and national climate finance and resources to local government and community-led care (social and ecological) initiatives. The Care Fund itself acts as a vehicle to pool international finance and resources (such as from WRI, the World Bank and UN) with government and private finances, and direct these finances towards a range of 'Care' programs, including the existing Care Block system, community-led ecosystem restoration and conservation projects, research, public access or education projects. The rationale behind this approach is that it will provide much needed funding and resources to existing care systems, Care Blocks and Guardians of the Wetlands, but it will also transform traditional hierarchical structures into relationships of collaboration, co-production and cross-pollination through its communityled Governance Framework.

TOWARD COMMUNITY-LED WATER GOVERNANCE

What if there was a symbiotic relationship between top-down international / national actors and bottom-up community climate adaptation?

READ MORE: POLICY MEMO FINAL PRESENTATION



COLUMBIA UNIVERSITY RECOMMENDATIONS

SUPPORT RESEARCH, PLANNING AND IMPLEMENTATION

Supporting planning and execution of a coastal blue economy in Cartagena through knowledge sharing and capacity-building Integrate the role as students to develop, in close collaboration with partnering organizations and stakeholders on the ground, a forecasting and geospatial data program to generate climate services tailored to local organizations' needs

ENABLE LONGER TERM PARTNERSHIPS

Longer partnership through potential internships or capstone projects to ensure continuity of projects led by local organizations such as Ecovida and Fundaciòn Grupo Social Maintain long-term partnerships with on-the-ground NGOs and community groups within Colombia/Cartagena Continue to expand upon this work in the next iteration of this class,, potentially offering more detail on how agencies can scale and support this work.

Create a pipeline for both the students and local stakeholders involved to keep these conversations going is key.

SUPPORT NETWORK AND LEARNING

Build the capacity on both ends to offer internships, capstones, or other opportunities where students can continue to collaborate with the organizations under study will have long lasting impacts. Make linkages to internships/jobs through Columbia World Projects or the Climate School that focus on monitoring and evaluation partnerships, projects, and climate services

Offer networking and collaboration opportunities for these groups by connecting them with participating stakeholders/actors within Columbia's network

COURSEWORK AND PEDAGOGY

Courses like Imagining Climate Resilience & Justice Support pedagogy that builds year after year to ensure that be important projects are not forgotten. Offer an extension of Water Urbanism Studio in Colombia, multi-year engagements, or bi-laterally, where Colombian students conduct a similar course here, where our own water projects could benefit and compensate from Colombian expertise. It is also an opportunity to decolonize pedagogy and curriculum.



COLUMBIA UNIVERSITY RECOMMENDATIONS

DEVELOP A CENTER FOR CLIMATE JUSTICE WITHIN THE CLIMATE SCHOOL TO LEVERAGE THE UNIVERSITY'S INTELLECTUAL CAPITAL FOR MEASURABLE SOCIAL IMPACT AND COMMUNITY ENGAGEMENT (ACROSS LOCAL, NATIONAL, REGIONAL, AND INTERNATIONAL SCALES)

- Not a think-tank, but a do-tank

 in alignment with Columbia
 University's fourth purpose
- Ensure that frontline communities have access to research facilities and resources that they have been historically excluded from
- Pro bono, no strings attached, to respond to the needs identified by a community — rather than a project commissioned by an external thirdparty state or corporate investor

INTEGRATE THE CENTER AS A HUB FOR EXISTING UNIVERSITY OUTREACH EFFORTS IN ORDER TO ELIMINATE REDUNDANCIES AND SILOS — INCLUDING COLUMBIA WORLD PROJECTS, EARTH INSTITUTE, SABIN CENTER, HUMAN RIGHTS INSTITUTE, AND CENTER FOR CONTEMPORARY CRITICAL THOUGHT

- Intra-university partners (within Columbia)
- Inter-university partners (among other universities)
- Frontline community organizations
- International and domestic climate justice coalitions
- Network of citywide climate action initiatives

• Cultural institutions and research partners

PUBLICLY COMMIT TO THE JEMEZ PRINCIPLES

Explore the role of Columbia's colonial legacy and repatriate any material elements of culture in the university's possession back to communities through intentional initiatives and public workshops

LAUNCH A "REGENERATIVE FUTURES INITIATIVE" TO TRANSFORM RESEARCH INTO CLIMATE ACTION TOWARD COLLECTIVE LIBERATION WITH A PRAXIS THAT EMPHASIZES HUMAN RIGHTS AND CLIMATE JUSTICE

- Elevate the voices, visions, demands, and dreams of frontline communities through responsible and non-extractive storytelling that enables communities to speak for themselves and engage in radical imagination
- Uplift transformative climate solutions across all scales (small and large) that have been advanced by frontline communities themselves
- Build relationships with communities through mutual trust, accountability, engagement, site visits, and continuity with sustained long-term commitment

- Equip communities with the intellectual capital, facilities, climatological data, science and policy research, legal support, media capacity, technology, scientific literacy, and other resources necessary to organize themselves
- Develop bold theories of change for climate action among various focus areas (i.e. mobility and migration, energy democracy, ecocide, decolonization, food sovereignty, labor, etc)
- Measure social impact by raising public awareness through strategic communications and media campaigns
- Invest in long-term partnerships and outcome driven programs









IMMERSIVE EXPERIENCE WITH LOCAL STAKEHOLDERS AT THE SITES SITE VISIT | FEB 28 TO MARCH 3, 2023

The objective of the travel experience was to provide students with an immersive learning experience that integrates theoretical knowledge with practical applications. By engaging with ongoing resilience efforts, local communities, and academic institutions in Colombia, the program sought to develop innovative design solutions and contribute to the ongoing policy work in the region. Through a combination of online convenings, an immersive in-person trip, and design projects, students gained valuable insights, collaborated across disciplines, and developed innovative solutions. The studio's

OBJECTIVES

- Explore the intersection of water, social life, nature-based infrastructure, housing, climate justice, and climate migration in the urban context of Colombia.
- development.
- policymakers, and practitioners.
- faculty members, and professionals from various fields.





COLUMBIA CLIMATE SCHOOL Climate, Earth, and Society



outcomes contribute to ongoing efforts in Colombia's resilience initiatives, while also preparing students to address the complex challenges of urban design, climate change, and social dynamics in a global context.

- Develop a comprehensive understanding of the geographic features including mountains, rivers, valleys, and the coastline, and their influence on urban

- Collaborate with ongoing resilience efforts and engage with local communities,

- Foster interdisciplinary collaboration and exchange of ideas among students,







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COMMUNITIES IN THE MAGDALENA RIVER FLOODPLAINS PHOTO CREDITS: THE NATURE CONSERVANCY

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