Case Study Context

Case Study Title: Downscaling the Sustainable Corridors

Tool Name: Urban Design Climate Workshop

City and District/Neighbourhood: Rio de Janeiro, São Cristóvão District

Organisations: Actors involved (a list of organisations)

UCCRN European Hub, UCCRN Latin American Hub, Pontificia Universidad Catolica de Rio de Janeiro, Fiocruz, New York Institute of Technology, Columbia University,

Delft University of Technology

City of Rio: (Prefeitura da Cidade do Rio de Janeiro, Rio Águas, Instituto Municipal de Urbanismo Pereira Passos, Relações Internacionais (International Relations Office), Escritório de Planejamento (Planning Office), Centro de Operações Rio (Rio de Janeiro's Operational Control Centre, Secretaria Municipal de Meio Ambiente da Cidade (Municipal Secretariat for the Environment).

Why a city wanted to use the tool:

Rio de Janeiro adopted the Urban Design Climate Workshop (UDCW) methodology to support the creation of a 2050 urban scenario integrating advanced climate simulations, with a focus on the district of São Cristóvão. Rio chose to use the UDCW tool to test a methodological and systemic approach for urban adaptation leveraging existing collaborations and global visibility to advance its resilience agenda. The city's interest was driven by:

- Established collaboration: UCCRN's Latin American Hub had already built strong partnerships with Rio's local authorities, universities, and research institutes on resilience and urban planning, creating trust and readiness for joint experimentation.
- Opportunity for synergies: The UDCW aligned with ongoing UCCRN initiatives in Rio (e.g., UCCRN_edu Erasmus+, expert meetings linked to the G20), allowing the city to connect local priorities with international networks and projects.

Description of case study area:

São Cristóvão was selected as a case study because it has been undergoing intense urban development in recent years, partly framed as an urban extension of the Porto Maravilha special plan. The neighbourhood represents a complex urban setting where climatic hazards are recurrent. In particular, it is highly vulnerable to flooding — as highlighted during the April 2010 rainfall events that severely affected several parts of Rio de Janeiro — and to heatwaves, due to limited and fragmented green spaces that reduce its capacity to mitigate extreme heat. Located in the historic Leopoldina region of Rio de Janeiro's North Zone, São Cristóvão is one of the city's oldest urbanised areas. Its occupation began in 1627 with the establishment of the Church of São Cristóvão by Portuguese settlers within indigenous territories, initiating early coastal settlements.

Originally characterised by extensive wetlands — notably the Mangue do São Diogo, a mangrove system stretching across what is now Cidade Nova and central Rio — the area was gradually transformed by successive waves of urban interventions. In 1835, the imperial government launched a major drainage programme, creating the Canal do Mangue to manage stormwater and redirect runoff to Guanabara Bay. This led to the disappearance of key ecological features, including the Lagoa da Sentinela and much of the São Diogo wetlands. Further changes occurred during the modernisation reforms of Mayor Pereira Passos (1902–1906), when the Saco de São Cristóvão, a shallow inlet of the bay, was landfilled to enable construction of the Port of Rio. Expansion of the Canal do Mangue along Avenida Francisco Bicalho reinforced infrastructural connectivity but permanently severed ecological links to the bay. The neighbourhood's identity evolved in parallel with these transformations. After becoming the seat of the Portuguese royal court in 1808, São Cristóvão gained an aristocratic reputation, later abandoned with the fall of the monarchy in 1889. Its strategic location near the port and transport routes then attracted factories and workshops, turning the "Imperial Neighbourhood" into an industrial hub. The legacy of this shift is still visible in its urban form and cultural fabric. In recent decades, many industries and infrastructures have declined or been decommissioned, such as Leopoldina Station (closed in 2001), leaving fragmented and underused urban spaces. At the same time, São Cristóvão remains a strategic mobility hub, served by rail–metro interchanges, the Intermodal Bus Station, and the new Terminal Gentileza (2024), which integrates buses, BRT, VLT, and metro services. However, large highways continue to divide the area, creating urban voids that hinder spatial cohesion.

Today, São Cristóvão reflects centuries of layered transformations shaped by political, economic, and environmental agendas. From colonial settlement to royal seat, industrial centre, and transport hub, the neighbourhood exemplifies Rio de Janeiro's broader challenges of urbanisation, ecological disruption, climate risk, and spatial justice.

Issues facing the city:

The study area of São Cristóvão reflects many of the structural issues currently facing Rio de Janeiro as a whole. These challenges emerge from the interaction between governance instruments, environmental vulnerabilities, and competing urban development agendas.

1. Governance Challenges São Cristóvão is regulated by a complex framework of planning tools that often overlap and produce tensions in implementation. The City Masterplan (*Plano Diretor*) provides the city-wide framework, but its local translation through the *Urban Structuring Project* (PEU, 2004) has seen multiple revisions. The PEU introduced *Areas of Special Interest* (AEIs), such as:

- AEIS (Social): targeting informal settlements like Mangueira, Tuiuti, Vila Arará, and Barreira do Vasco for urbanisation and regularisation.
- AEIT (Tourism): promoting cultural and recreational investment.
- AEIF (Functional): designating areas for major institutional complexes, such as the FIOCRUZ health campus.
- AEIU (Urbanisation): enabling urban restructuring and revitalisation projects with tailored land-use rules.

While these instruments were designed to balance social inclusion with economic development, their uneven application has often favoured speculative redevelopment over community needs. This has been accentuated by the extension of the *Operação Urbana Consorciada* Porto Maravilha into São Cristóvão (since 2024), which has intensified real estate pressures and risks displacing popular economies and cultural traditions.

2. Urban Climate Risks and Environmental Pressures São Cristóvão is particularly exposed to climate hazards, many of which are rooted in its historical transformation from wetlands into a densely urbanised district:

- Heat Stress: The neighbourhood exhibits elevated surface temperatures due to scarce green cover, extensive impermeable surfaces, and the urban heat island effect.
- Flooding: The Canal do Mangue, originally engineered for drainage, is now insufficient to manage stormwater, leading to recurrent flooding during heavy rainfall and exacerbated by untreated sewage inflows. The loss of wetlands and vegetation has reduced the area's natural water retention capacity.
- Air and Water Quality: Heavy traffic corridors, outdated sewage infrastructure, and ongoing densification contribute to deteriorating environmental conditions, affecting both ecosystems and public health.

Despite hosting major green and cultural assets such as Quinta da Boa Vista and the National Observatory, São Cristóvão's ecological infrastructure remains fragmented, underutilised, and poorly aligned with climate adaptation goals.

3. Policy Framework Contradictions

The governance of São Cristóvão illustrates broader contradictions in Rio's urban policy. On the one hand, instruments such as AEIs and urban operations provide opportunities for cultural recognition, service provision, and spatial integration. On the other, their application often reflects uneven power dynamics and speculative logics that undermine the social function of land. As a result, the neighbourhood — like others in the North Zone — faces persistent challenges in aligning urban development with principles of equity, sustainability, and resilience.

Applying your Tool to the Case Study

Detailing the process of collaborating with the city:

The collaboration between UCCRN (technical partner), TU Delft (liaison), and Rio's municipal partners began in May 2023 with the goal of providing technical support tailored to the city's needs. Initially framed as technical support, the collaboration evolved into a process of co-developing knowledge with the municipality, local partners and stakeholders, adapting the UDCW to local priorities and to the developing of a prototype.

Phase 1 (2023 – early 2024): Relationship Building and Knowledge Exchange

- First contacts established between Rio City Hall and tool providers, creating synergies.
- Initial workshop tested how the Urban Design Climate Workshop (UDCW) methodology could be applied to the Rio case, using São Cristóvão as a pilot area. This was not yet a full prototype but rather a proof of concept.
- In March–April 2024, UCCRN, TU Delft, and partners organised two weeks of activities:
  - Round tables and expert meetings with UCCRN Regional Hubs.
  - A student urban design workshop with PUC-Rio and NYIT.
  - Sessions with municipal authorities and community representatives
- The phase concluded with a demonstration project presented to the Municipality incorporating feedback from local stakeholders and external expertise (e.g. Deltares on flood risk, NOSSA on community engagement).

Phase 2 (mid-2024 onwards): Prototype Phase

Downscaling the Sustainable Corridors Vision

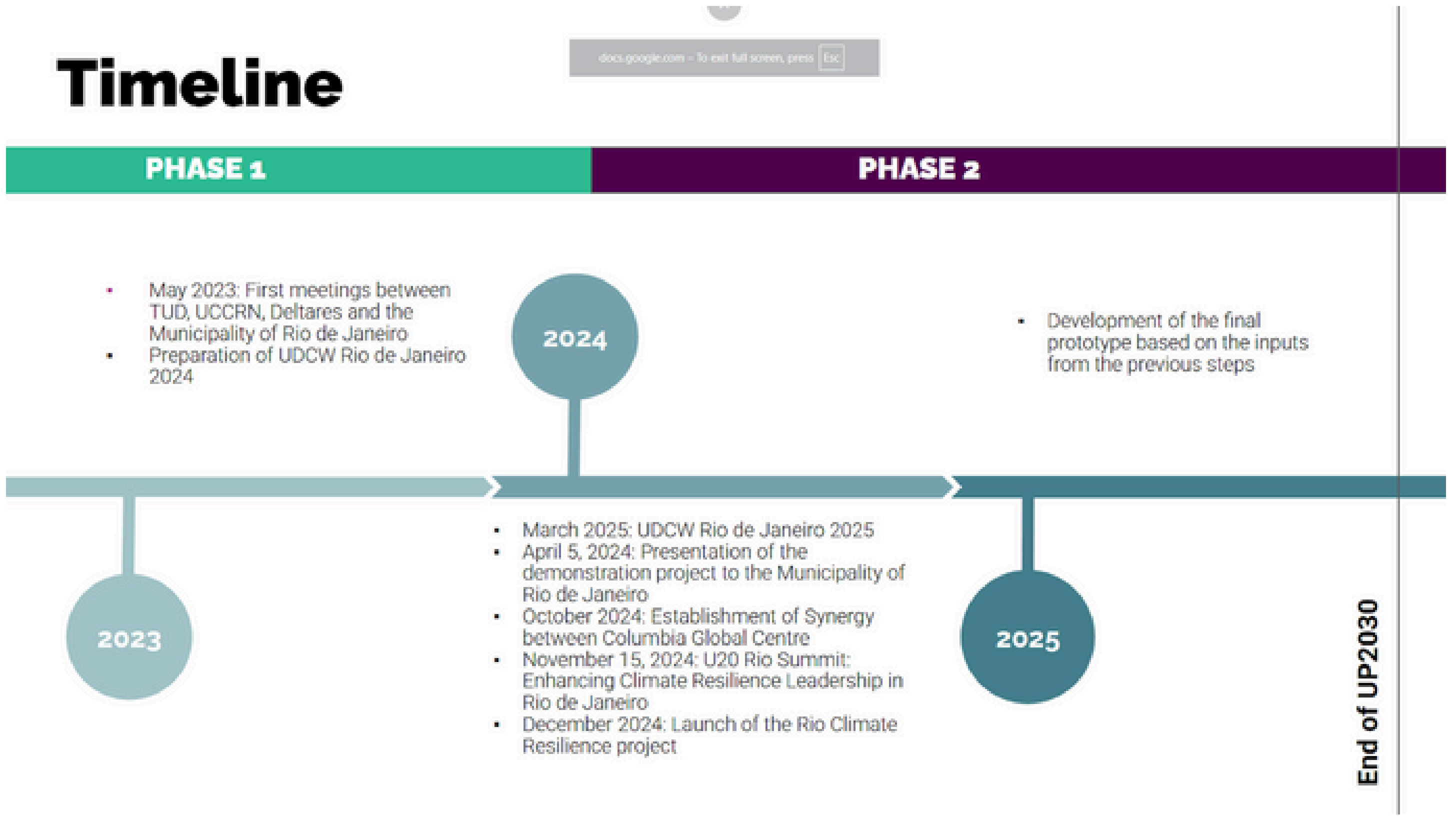
- Building on Phase 1, the collaboration moved into the prototyping stage, where the UDCW was applied to downscale Rio's Sustainable Corridors Vision.
- São Cristóvão was selected as the entry case, serving as a sample area to test the methodology and refine the prototype in a more operational way.
- UCCRN focused on aligning the prototype with Rio's long-term resilience agenda, preparing the second iteration for presentation to the city.

Integration with Wider Initiatives (late 2024)

- In October 2024, synergies were established with the Rio Climate Resilience Project (Columbia Global Centre, NASA-GISS, Columbia Climate School), enhancing UP2030 goals of climate-informed urban design, resilience-building, and global knowledge transfer.
- During the G20 Rio Summit (November 2024), Rio's climate leadership was showcased through high-level events with Mayor Eduardo Paes, municipal leaders, academics, and international partners, reinforcing the city's positioning as a reference in urban climate resilience.

Next Steps (2025 and beyond)

- Develop an urban planning and design portfolio integrating climate data with Rio's GIS system.
- Conduct capacity-building activities for municipal departments to incorporate advanced solutions for resilience, decarbonisation, and spatial justice.
- Enhance risk assessment for heatwaves and flooding, integrating socio-economic vulnerabilities at the neighbourhood scale.
- Promote co-design approaches with communities, ensuring inclusive and context-sensitive outcomes.
- Consolidate synergies across projects (UP2030, UCCRN_edu, NSF-City-as-Lab) as a joint platform for climate research and action in Rio and Latin America.
- Strengthen institutional integration by aligning City Hall departments through tool co-development and training.



<u>Integrating tool into local context:</u>

The São Cristóvão district in Rio de Janeiro, currently undergoing extensive redevelopment—including the new Flamengo stadium, Porto Maravilha waterfront regeneration, a multimodal transport hub, and the transformation of Leopoldina station—provides an ideal testing ground for the Sustainable Corridors initiative. In response to stakeholder requests, scenario-based approaches have been adopted to ensure corridor designs align with local priorities and planned urban projects. The Urban Design Climate Workshop (UDCW) addresses these needs by identifying climate risks and impacts specific to São Cristóvão, assessing design interventions that balance adaptation, mitigation, and socio-spatial justice, and prototyping solutions through simulations of heatwaves, floods, energy demand, emissions, and ecosystem services. By facilitating co-design processes with stakeholders, the UDCW ensures that equity and accessibility are embedded at the community level. Linking PDS objectives with locally grounded design strategies, the São Cristóvão pilot demonstrates the practical translation of Sustainable Corridors from vision to implementation, enhancing Rio's capacity for climate-resilient urban transformation and providing a model for other cities in Brazil, Latin America, and beyond.

<u>Examples of tool being used:</u>

The UDCW simulation tool has been used in particular for Multi-scale Scenario comparison (Current, Business as usual and Best Practice). The following samples illustrate a focus area (Canal do Mangue) of the district in which microclimate assessment were performed: Current state; Buisness as usual; Best Practices with the simulation of climate-resilient interventions related to renaturalization of a former industrial site, creation of new public spaces pocket parks, social housing and community services.

More specifically, the UDCW simulation tools were used to calculate two key performance indicators related to outdoor thermal comfort: Mean Radiant Temperature (MRT) and Universal Thermal Climate Index (UTCI)

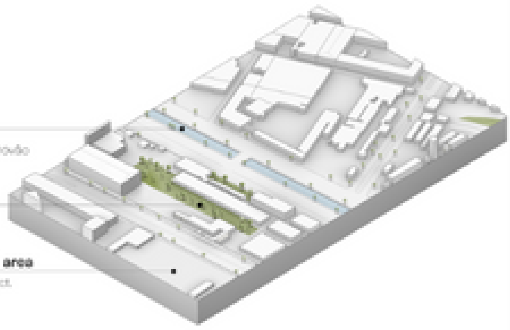
Area 2: Canal do Mangue

SCENARIO 1:
CURRENT STATE

Canal do Mangue
Waterway acting as a boundary between the districts of São Cristovão and Santo Cristo.

Ex industrial area
Currently disused.

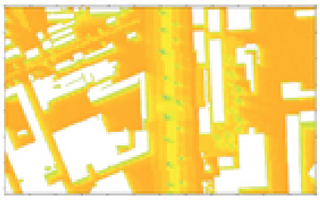
Planned residential growth area
Area related to Porto Maravilha project.



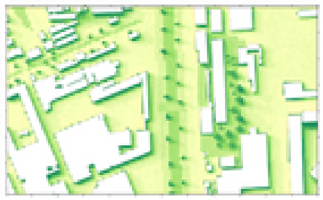
COMFORT OUTDOOR SIMULATION
Epw: Copacabana_RJ_Brazil_2020
Simulation period: 16 November 2020
Time: 12:00 - 18:00

Air T°: 32,8°C
Max T°: 35,7°C
Wind speed: 1,58 m/s
Relative umidity: 56%
Moan T° MRT: 45,1°C
Moan T° UTCI: 36,9°C

Universal thermal comfort index **(UTCI)**



Mean radiant temperature **(MRT)**



26°C 30°C 36°C 42°C 46°C 50°C 54°C

30°C 40°C 50°C 60°C 70°C 80°C 90°C

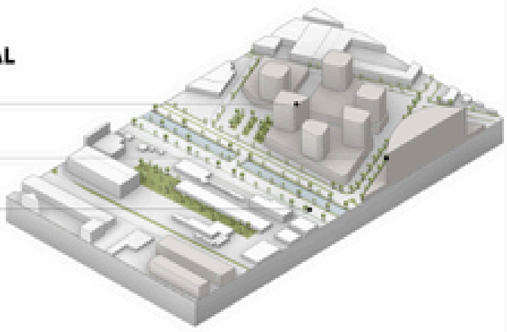
Area 2: Canal do Mangue

SCENARIO 2:
BUSINESS AS USUAL

New administrative area
New administrative buildings for offices and services

New Flamengo stadium
Development of new stadium and open spaces.

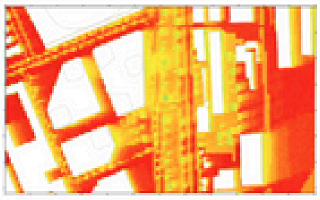
Green corridor



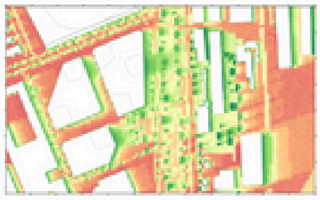
COMFORT OUTDOOR SIMULATION
Epw: Copacabana_RJ_Brazil_SSP585_2050
Simulation period: 16 November 2050
Time: 12:00 - 18:00

Air T°: 36,0°C
Max T°: 42,8°C
Wind speed: 2,84 m/s
Relative umidity: 30%
Mean T° UTCI: 41,5°C

Universal thermal comfort index **(UTCI)**



Mean radiant temperature **(MRT)**

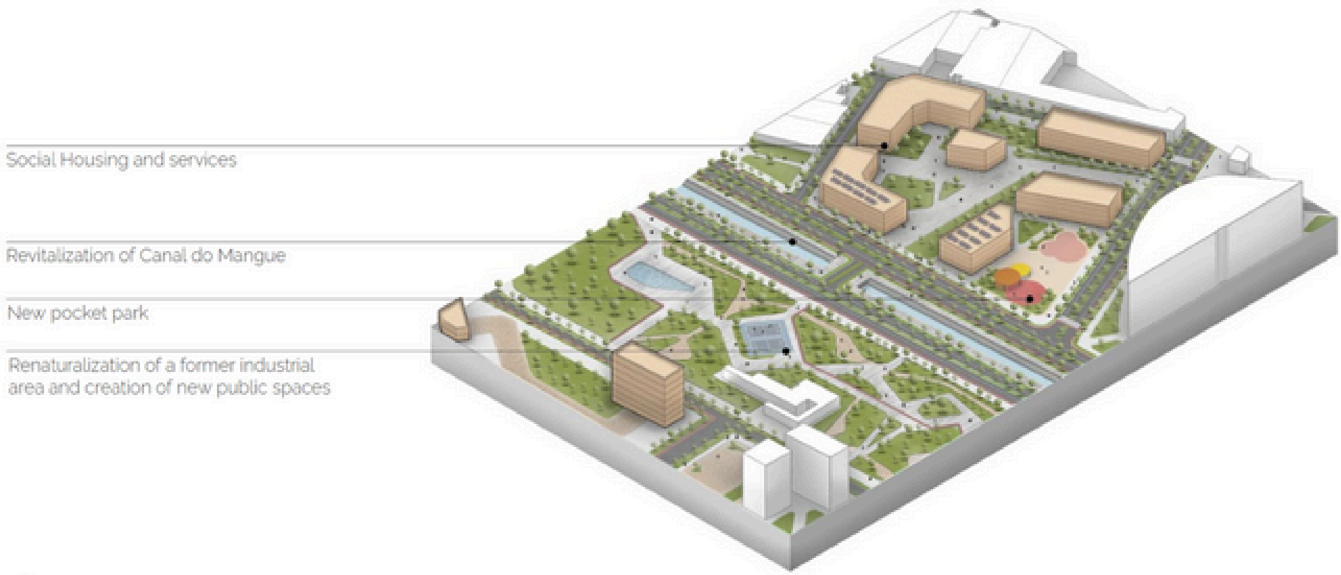


26°C (no stress) 30°C (stress moderatl) 36°C (stress moderatl) 42°C (stress forte) 46°C (stress forte) 50°C (stress molto forte) 54°C (stress molto forte)

30°C 40°C 50°C 60°C 70°C 80°C 90°C

Scenario comparison

Area 2: Canal do Mangue



0m 100m 200m

Scenario comparison

Area 2: Canal do Mangue

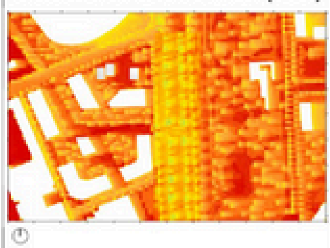
0m 100m 200m

COMFORT OUTDOOR SIMULATION

Epw: Copacabana_RJ_Brazil_SSP585_2050
Simulation period: 16 November 2050
Time: 12:00 - 18:00

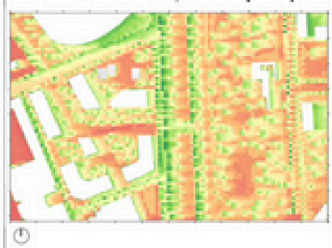
Air T°: 36,0°C
Max T°: 42,8°C
Wind speed: 2,84 m/s
Relative umidity: 30%
Mean T° UTCI: 42,9°C
Mean T° MRT: 54,4°C

Universal thermal comfort index **(UTCI)**



- 26°C (no stress)
- 30°C (moderate stress)
- 36°C (moderate stress)
- 42°C (high stress)
- 46°C (high stress)
- 50°C (very high stress)
- 54°C (very high stress)

Mean radiant temperature **(MRT)**



- 30°C
- 40°C
- 50°C
- 60°C
- 70°C
- 80°C
- 90°C

Challenges:

The application of the Urban Design Climate Workshop (UDCW) tool to São Cristóvão faced multiple, interrelated challenges linked to the complexity of the area. A key difficulty was the comprehensive analysis of the site, encompassing climate risks, land use patterns, urban form, and the intricate policy framework governing the neighbourhood. Understanding recurrent flooding, heat stress, fragmented green spaces, and environmental pressures required detailed climate modelling and simulations to accurately capture local vulnerabilities (e.g. informal settlements). At the same time, mapping land use and assessing the implications of overlapping planning instruments—such as the City Masterplan, the Urban Structuring Project (PEU), and various Areas of Special Interest (AEIs)—was essential to identify opportunities and constraints, helping to distinguish what strategies to prioritize and what interventions to avoid. Policy contradictions and uneven implementation further complicated this process, demanding careful interpretation of governance structures to align the UDCW tool with local needs and socio-spatial justice objectives. Operational challenges also arose in coordinating stakeholders, municipal authorities, and academic partners, requiring iterative co-design sessions to translate complex analyses into actionable scenarios for heatwaves, floods, energy demand, emissions, and ecosystem services. Despite these difficulties, the systematic analysis of the area enabled informed, locally grounded decisions that strengthened the effectiveness and relevance of the Sustainable Corridors pilot.

Outcomes of Tool Use:

Results/Insights:

The application of the UDCW tool to São Cristóvão generated a series of results and insights that informed both climate-resilient design strategies and policy recommendations. Two preliminary development scenarios—Current State and Business-as-Usual (BAU)—were modeled at neighborhood scales to establish baselines and project future conditions. The Current State scenario, incorporating existing built form, land cover, and vegetation, highlighted areas of high thermal stress due to limited greenery and extensive soil sealing, as well as flood-prone zones exacerbated by insufficient drainage infrastructure. Heatwave simulations under current conditions (36–38°C) and minimal ventilation identified hotspots requiring targeted mitigation, while pluvial flood analysis based on the April 2010 extreme event revealed vulnerabilities concentrated along the Canal do Mangue and adjacent areas.

The BAU scenario projected future urban development under existing planning trends, including municipal and private sector projects, and simulated future climate conditions under RCP 8.5. Results indicated a worsening of heat stress in northern São Cristóvão due to increased building density, whereas areas benefiting from planned green infrastructure interventions, such as the Marvel Harbour redevelopment, experienced localized improvements in thermal comfort. Flood simulations under BAU highlighted persistent exposure in the absence of targeted adaptation strategies, confirming the need for integrated urban drainage and resilience measures. Complementary analyses—encompassing policy and governance frameworks, green and blue infrastructure, socio-spatial vulnerability, and accessibility—provided critical context for interpreting simulation outcomes. Mapping overlapping planning instruments (e.g., Plano Diretor, PEU, AEIS, APAC, and Porto Maravilha expansion) helped identify opportunities and constraints, guiding the selection of interventions to avoid adverse impacts and prioritize socially and environmentally beneficial actions. Collectively, these results demonstrate the tool's capacity to translate Sustainability Corridors into context-specific strategies, supporting decision-making for climate-resilient, inclusive, and adaptive urban development in São Cristóvão.

Beyond the scenario-based simulations, the tool application in São Cristóvão included the development of analyses focused on best practices and the elaboration of a masterplan that operationalizes the concept of Sustainability Corridors at a localized scale. The corridors, central to Rio de Janeiro's Sustainable Development Plan, were downscaled to guide interventions within the urban fabric of São Cristóvão, translating metropolitan strategies into targeted actions that embed resilience, mobility, and ecological functions into smaller-scale areas. The masterplan integrates multiple dimensions: social inclusion through new and retrofitted housing; mobility improvements via pedestrian and cycling networks connecting residential clusters, green corridors, and major projects such as the Flamengo stadium; and ecological regeneration, converting abandoned or underutilized spaces into green infrastructure that enhances biodiversity and climate adaptation. Public spaces, cultural, educational, and recreational facilities are strategically distributed to reinforce community resilience and identity, fostering equitable access to services and opportunities. This process of downscaling and spatial integration demonstrates how the tool can translate the principles of sustainable corridors into actionable urban strategies, embedding them into local planning and design interventions. By linking climate-informed analyses with the structured framework of the corridors, the masterplan not only addresses thermal stress and social inequities identified in the scenario simulations but also provides a replicable model for resilient urban regeneration within São Cristóvão and potentially other neighborhoods in Rio de Janeiro.

CASE 2 Rio de Janeiro (2024–2025)	
Outcomes	- Creation of a city masterplan scenario for 2050, incorporating climate simulations to identify critical areas needing intervention - Application of tools and methodologies to integrate science-driven decision-making into urban planning processes, fostering local capacity building for resilient development - Exchange activities and workshops strengthened collaborations and knowledge sharing - Positioned Rio to advance climate neutrality and resilience goals within global frameworks
Climate / No-Climate Related Priorities	**Climate-related:** - Addressing hazards such as flooding and heatwaves through science-based assessments and resilient urban design - Incorporating climate mitigation and adaptation into city planning (green infrastructure, decarbonization pathways, more public green spaces) - Enhancing local capacity for climate risk assessment and resilient infrastructure planning using advanced tools and participatory approaches **Non-climate-related:** - Consolidation of informal settlements - Reducing socio-spatial segregation - Improving access to public spaces, education, and health services - Promoting sustainable urban growth through verticalization and infrastructure upgrades - Supporting spatial justice and equitable resource distribution
Design Strategies	- Applying climate simulations to identify critical areas for intervention, guiding urban design in neighborhood-scale projects - Promoting green and blue infrastructure (green corridors, permeable surfaces, flood mitigation systems) - Utilizing 3D simulations and GIS tools for data-driven urban planning - Fostering cross-disciplinary and stakeholder collaboration to align development with climate adaptation and mitigation
Synergies (Plans, Projects, Strategies, Actors)	- Plan for Sustainable Development and Climate Action (PDS) - "Rio Climate Resilience" initiative with Columbia Global Center and NASA-GISS - G20 Summit
Barriers and Gaps	- Lack of funds to fully develop the UDCW methodology - No resources to use the UDCW facilitation toolkit - Simulation modeling accuracy and need for updates - Use of HEC-RAS Unsteady Flow simulation analysis to determine flooding hazard
Innovation	- Data collection protocols - Application of UDCW methods to combine climate simulations with participatory planning - Integration of advanced tools (3D/GIS, HEC-RAS) for scenario development and hazard assessment - Strengthening local capacity through knowledge-sharing activities and international collaborations

Lessons learned:

The São Cristóvão case study highlights several key lessons in applying climate-informed urban design tools at the neighborhood scale. First, translating metropolitan strategies, such as Rio de Janeiro's Sustainability Corridors, into context-specific interventions requires a deep understanding of local governance, policy frameworks, and socio-spatial dynamics. The overlapping planning instruments and ongoing redevelopment projects in São Cristóvão demonstrated that high-level visions must be critically analyzed and adapted to avoid conflicts, guide priorities, and ensure social equity. Second, integrating climate analyses with urban design—through heatwave simulations, spatial assessments of vegetation and green infrastructure, and multi-scenario modeling—proved essential for identifying both vulnerabilities and opportunities within the urban fabric. This process highlighted the importance of embedding resilience and ecological functionality into the design of public spaces, housing interventions, and mobility networks, ensuring that adaptation measures are not isolated but contribute to broader social and environmental goals. Third, the downscaling of Sustainability Corridors into a localized masterplan illustrated how metropolitan strategies can be operationalized at finer scales, creating an integrated framework that links housing, mobility, public space, and ecological regeneration. The approach demonstrated that iterative co-design with stakeholders, combined with data-driven simulations, is critical for producing actionable, inclusive, and resilient solutions.

Overall, the São Cristóvão Prototype shows that high-level sustainability visions can be successfully translated into neighborhood-level interventions when informed by comprehensive analysis, multi-stakeholder collaboration, and adaptive planning. The methodology developed here provides a replicable framework for other districts in Rio de Janeiro and cities worldwide, emphasizing the value of combining strategic planning, climate resilience, and social equity in urban transformation processes.

The role of the tool in supporting improved decision making:

- **Cross-sectorial capacity building to enable local offices** in introducing in their operational realm advanced solutions for resilient-planning. The necessity to overcome siloed approaches has been pointed as a main barrier for considering more holistically climate-related risks, public infrastructures, housing policies, environmental protection actions. Synergies with EPL, Escritório de Planejamento da Prefeitura do Rio de Janeiro+IPP, Instituto Pereira Passos, Prefeitura do Rio de Janeiro
- **Knowledge exchange about science-driven and evidence-based planning processes,** in particular about risk modelling and risk mitigation options and co-benefits of adaptation can facilitate the uptake of more equitable and environmental sustainable solutions (e.g. nature based solutions for flood protection). Synergies with COR, Centro de Operações Rio, Prefeitura do Rio de Janeiro; IPP, Instituto Pereira Passos, Prefeitura do Rio de Janeiro.
- **Concrete opportunities to implement UP2030 tools bundling** between heat waves modelling (provided by UCCRN tools) and flood modelling (provided by DELTARES), for specific requirement of (Rio Águas, Fundação Instituto das Águas, Prefeitura do Rio de Janeiro)
- **Synergies with on-going environmental actions related to nature protection, community based initiatives, environmental education** driven by SMAC, Secretaria Municipal de Meio Ambiente da Cidade, Prefeitura do Rio de Janeiro, within municipal programmes for the management of the Atlantic forest in the favelas, community gardens.These included: Policy and Governance, examining the institutional frameworks and planning instruments that shape interventions in the area; Green and Blue Infrastructure, assessing ecological assets, vegetation, and water systems that influence climate resilience; Socio-Spatial Aspects, focusing on patterns of social vulnerability, and demographic distribution; and Accessibility, analyzing mobility networks and the proximity of essential services. Together, these dimensions provided an integrated basis for translating the Sustainability Corridors into context-specific strategies. Many concurrent policies affect the region of São Cristóvão. In particular, the neighborhood is influenced by the **Plano Diretor (Masterplan)**, the **PEU São Cristóvão (2004)**, the designation of Áreas de Especial **Interesse Social (AEIS)** and **Áreas de Proteção do Ambiente Cultural (APAC),** as well as the recent expansion of the **Operação Urbana Consorciada Porto Maravilha (OUC).** Each of these instruments carries distinct priorities, ranging from cultural heritage preservation and social housing to urban redevelopment and large-scale investment. This creates an additional layer of complexity for new projects in the area, as concurring visions and objectives coexist within the same urban territory. The purpose of UDCW implementation and its in-depht analysis has been to examine both the risks associated with the expansion of Porto Maravilha into São Cristóvão and the opportunities that emerge. In particular, it emphasizes how the concept of sustainability corridors — as outlined in the city's strategic vision — can serve as a unifying backbone for reconciling these multiple planning instruments, guiding development toward more integrated, inclusive, and resilient outcomes.

Looking Towards the Future:

Future outcomes/opportunities

- Continued synergies: Collaboration between the UCCRN European Hub and Latin American Hub will sustain UDCW implementation with the City of Rio and local partners. Rio will continue serving as a case study for education and training at institutions such as the University of Naples Federico II, New York Institute of Technology, and PUC-Rio.
- Pilot case in international research: Rio has been included as a pilot city in a Horizon Europe proposal focused on innovative solutions for resilient and climate-adapted coastal communities in the Atlantic.
- Global visibility: The work of UCCRN and the Rio prototype will be presented at COP30 in Belém, Brazil, highlighting Rio as a leader in urban climate resilience and showcasing the outcomes of the collaboration on the global stage.