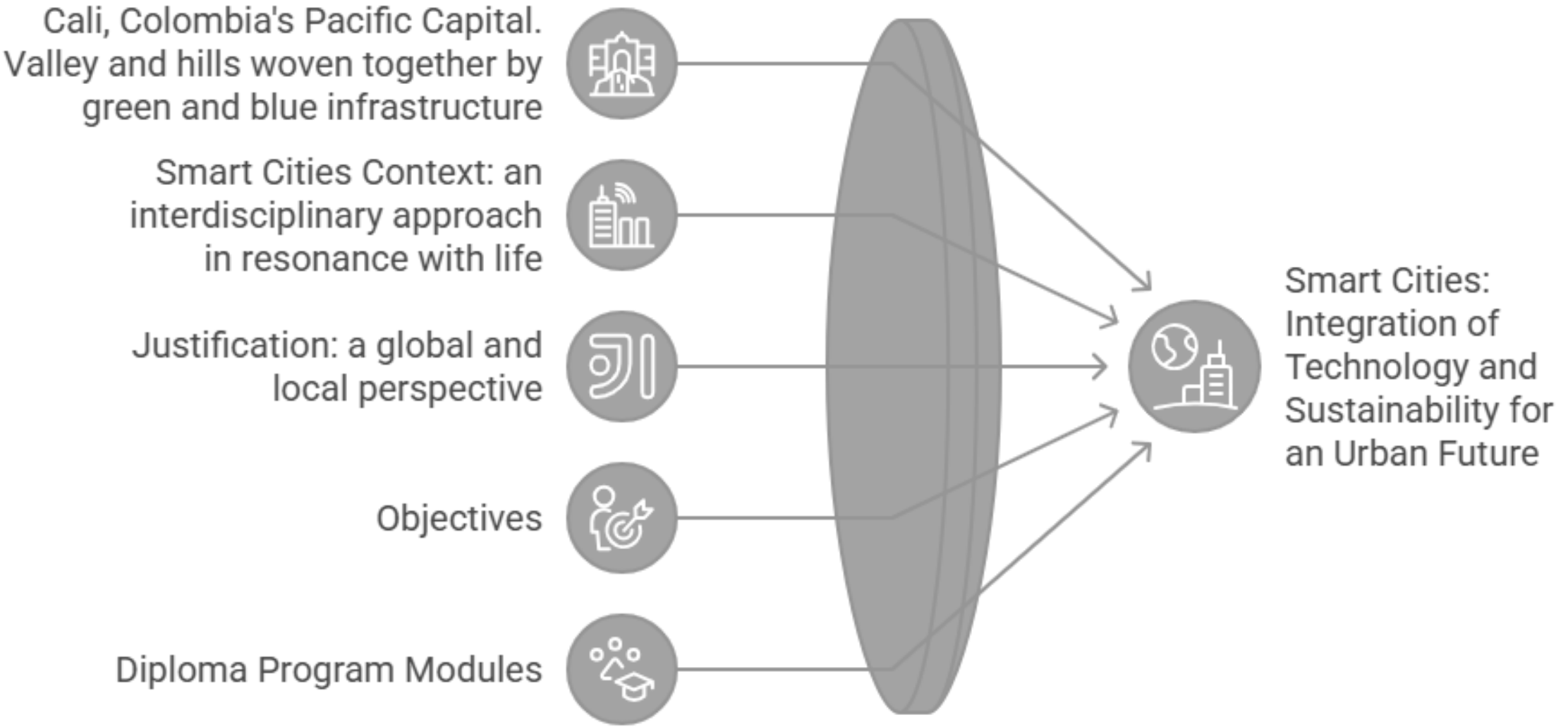
Diploma in Smart Cities:
Integrating Technology and Sustainability for the Future of Urban Living

Program Length: 72 hours, 24 classes

Barberi Faculty of Engineering, Design and Applied Sciences

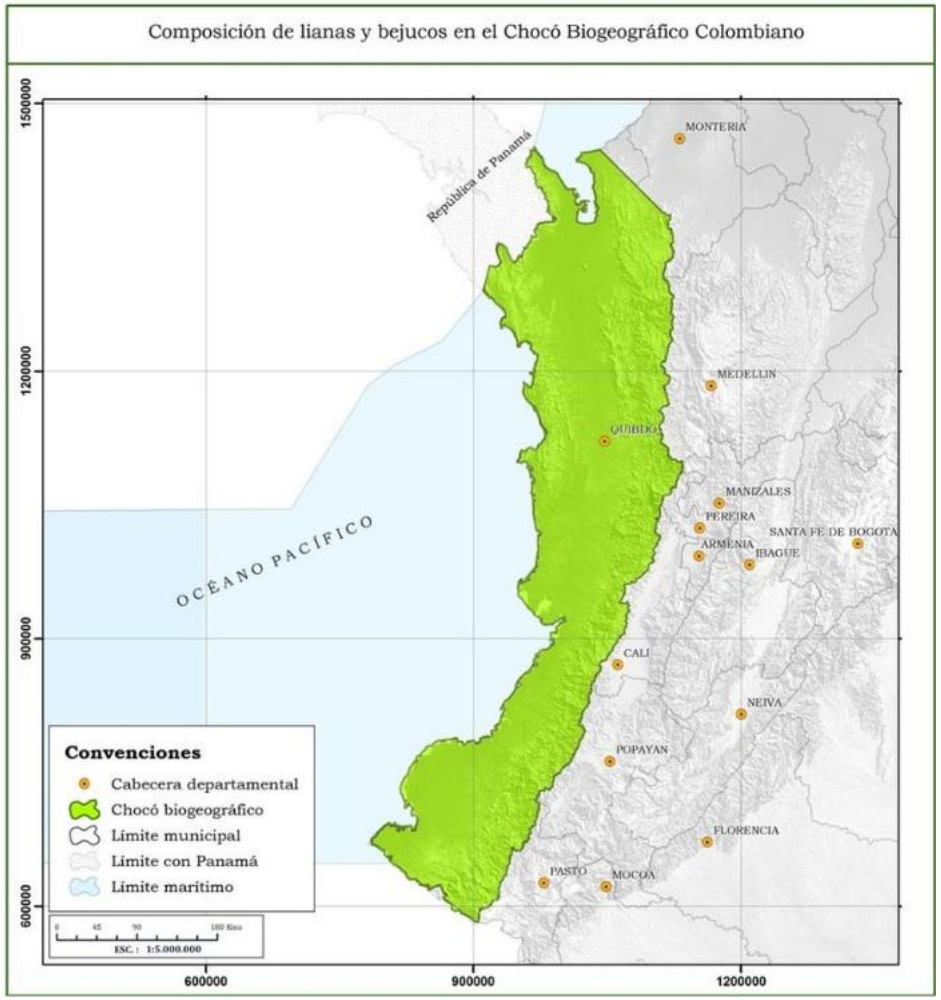
Universidad ICESI

Agenda

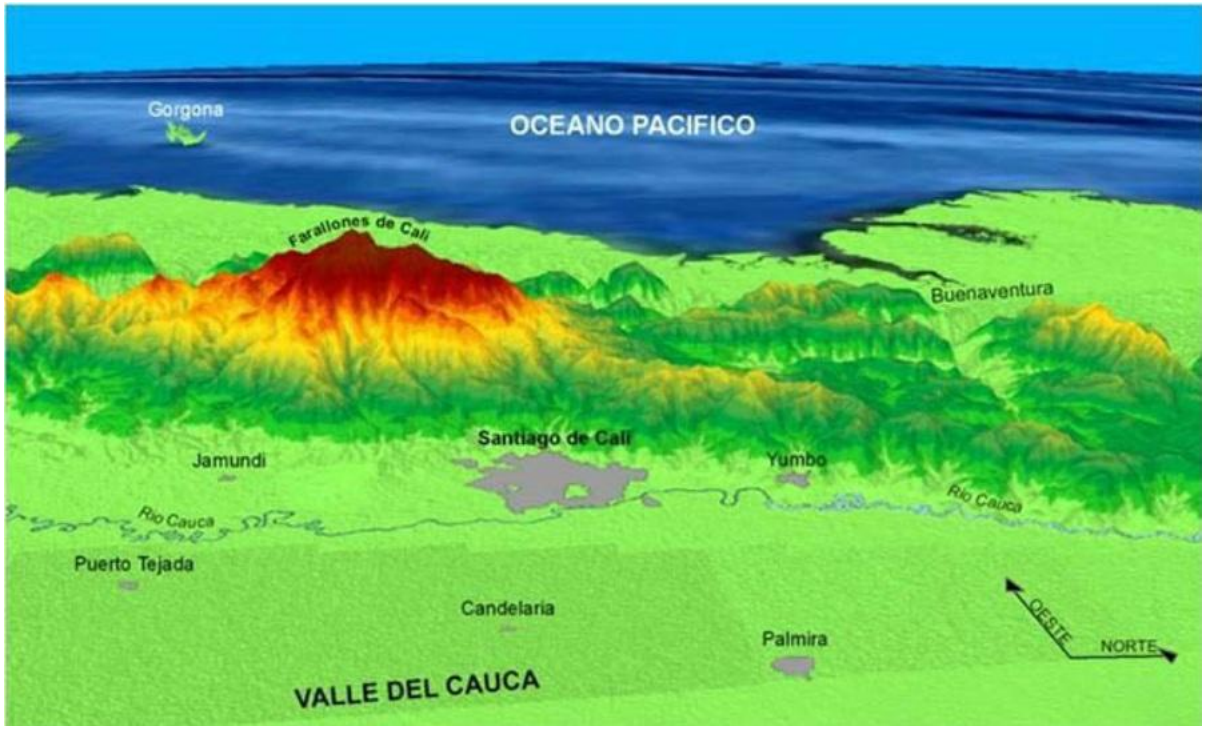

Cali, Colombia's Pacific Capital. Valley and hills woven together by green and blue infrastructure
Smart Cities Context: an interdisciplinary approach in resonance with life
Justification: a global and local perspective
Objectives
Diploma Program Modules
Smart Cities: Integration of Technology and Sustainability for an Urban Future

Cali, Colombia's Pacific Capital: Chocó Biogeographic Region

Valley and hills woven together by green and blue infrastructure



Fuente: https://www.researchgate.net/publication/282956397_Composition_of_lianas_and_vines_in_the_Colombian_Choco



Fuente: https://bellasartes.edu.co/festivalruquitavelasco/valle-del-cauca/

Cali, Colombia's Pacific Capital: Cali is Cali, and the hills are part of it too

Valley and hills woven together by green and blue infrastructure

Fuente: https://www.behance.net/gallery/54861947/Ilustraciones-para-Carucos-%28Cocreacion%29

Cali, Colombia's Pacific Capital: Parque Integral Cristo Rey

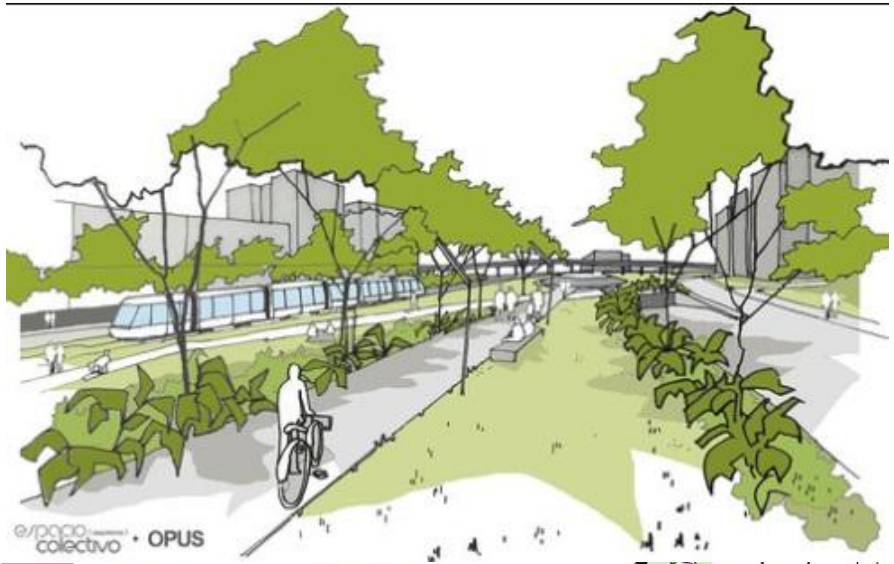
Valley and hills woven together by green and blue infrastructure

1. Iglesia La Milagrosa
2. Estadio Pascual Guerrero
3. Parque de las Banderas
4. Club San Fernando
5. Clinica Imbanaco
6. Calle 5ta
7. H.U.V
8. Facultad enfermeria U.VALLE
9. U.VALLE sede San Fernando
10. Parque del Perro
11. Plan Parcial Morelia
12. Universidad Libre
13. Av. Circunvalar
14. Tanque de Siloé
15. Teatro al aire libre Cristales
16. Casa Santa Maria de las Palmas
17. Asentamiento Brisas de Cristales
18. Via a Cristo Rey
19. Río Cali
20. Río Aguacatal
21. Monumento Cristo Rey

Fuente: https://www.elpais.com.co/cali/cali-tendra-el-corredor-biologico-peatonal-mas-extenso-de-colombia-0139.html

Cali, Colombia's Pacific Capital: Cali’s Future Green Corridor

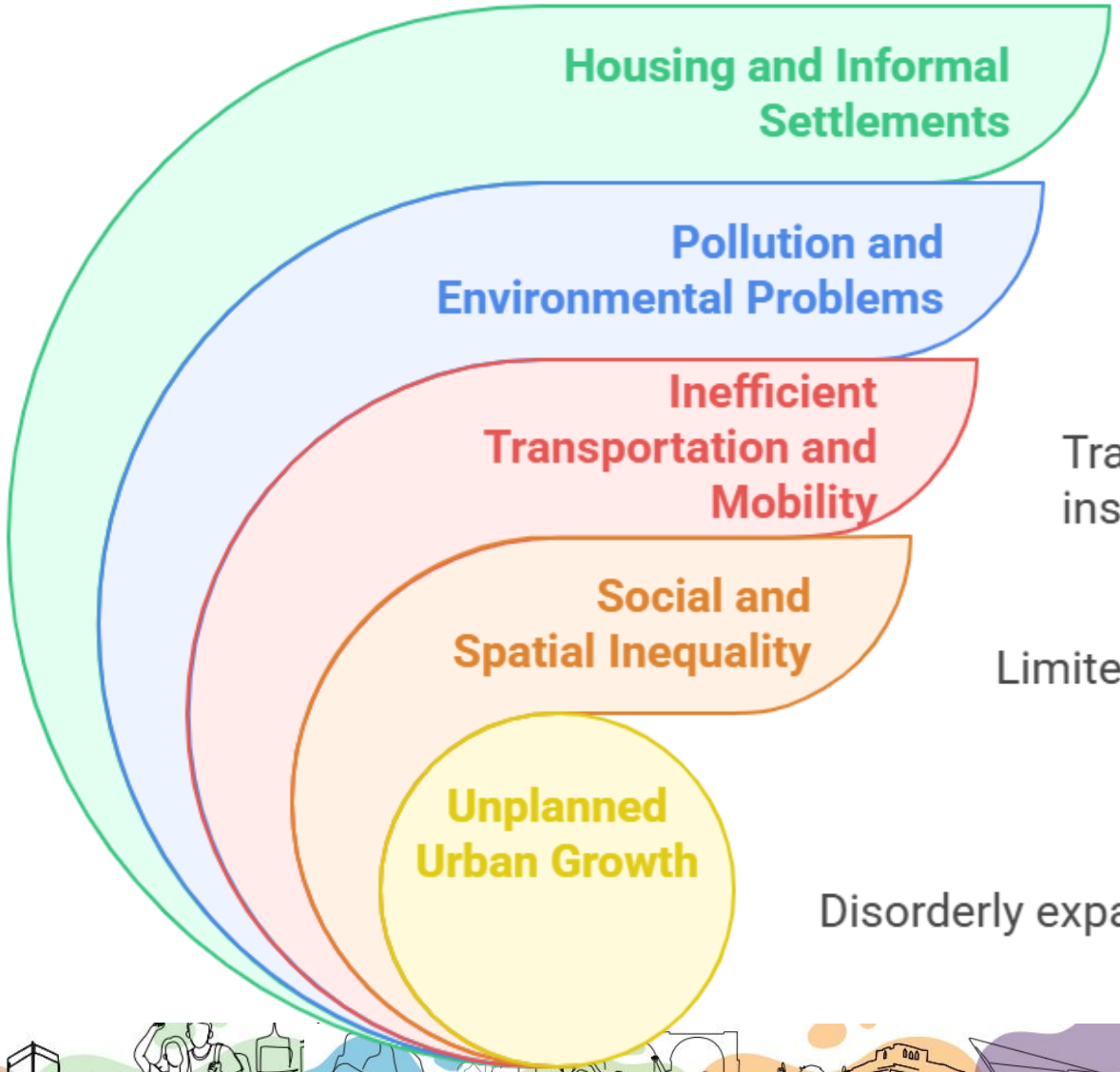
Valley and Hills woven together by green and blue infrastructure



Fuente: https://www.opusestudio.com/tercorredor-verde-cali

Latin-American Context

Common Urban Challenges and Opportunities for Transformation



Shortage of affordable housing and deficient infrastructure

High air and water pollution

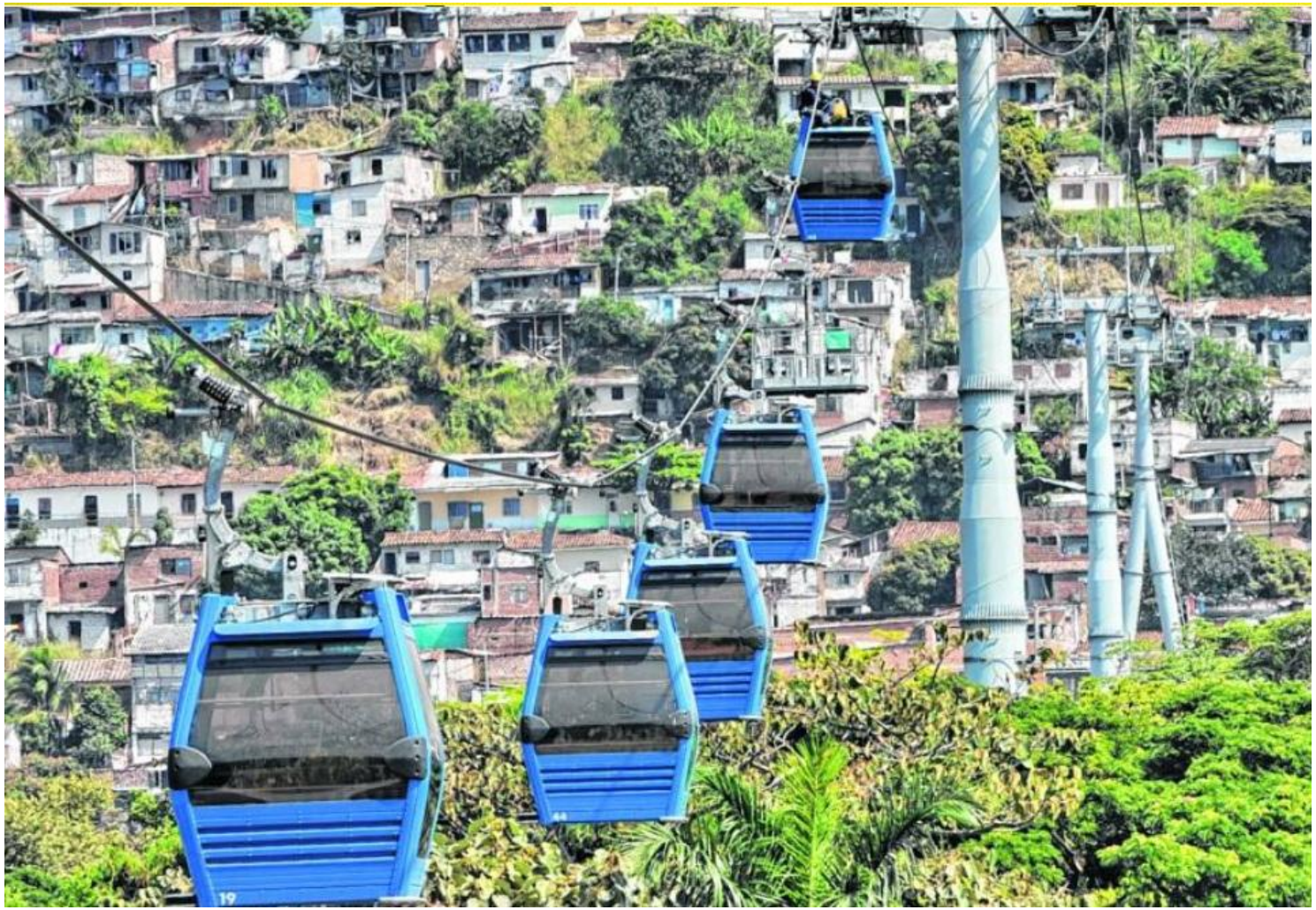
Traffic congestion and insufficient public transport

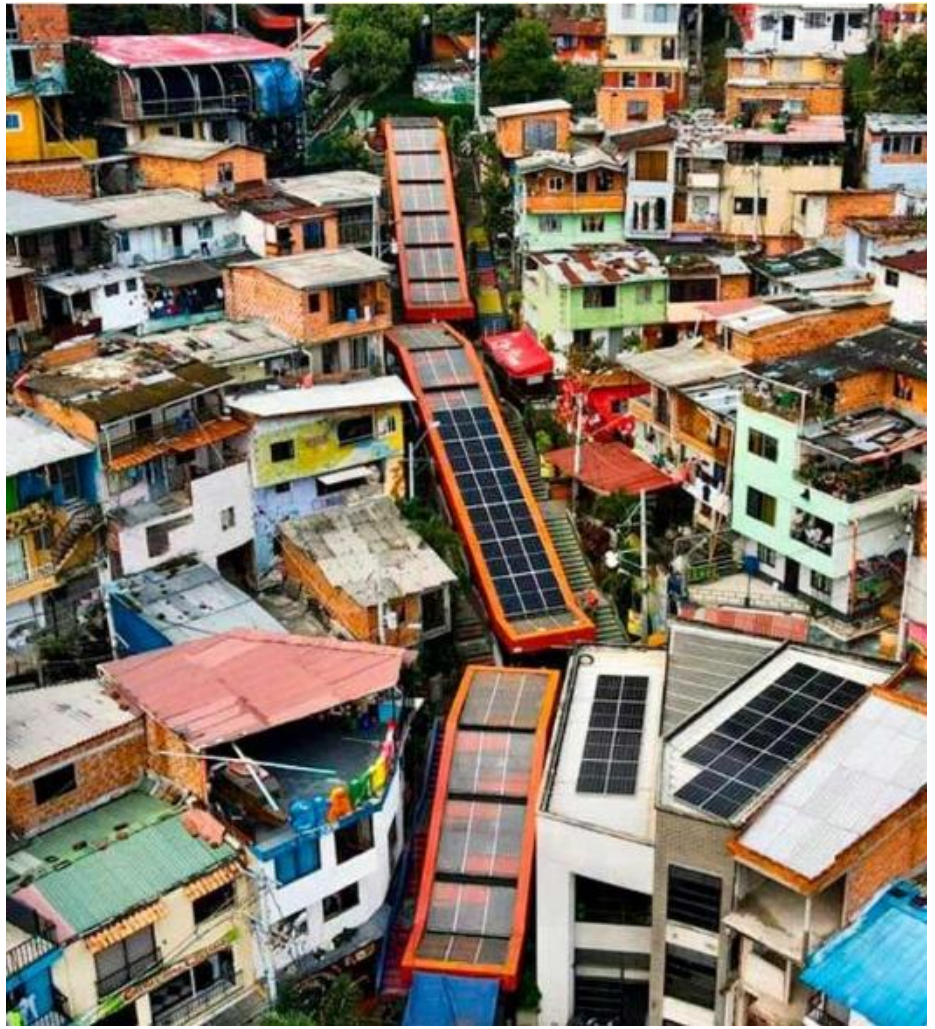
Limited access to basic services

Disorderly expansion without infrastructure

Latin-American Context

Common Urban Challenges and Opportunities for Transformation





Fuente: https://www.qhubocali.com/asi-paso/cali-es-cali-construyeron-en-una-terraza-y-frenaron-el-regreso-del-mio-cable/

Fuente: Imagen de la Alcaldía de Medellín [medellin.gov.co]

Latin-American Context: Parques del Rio
Common Urban Challenges and Opportunities for Transformation

Fuente: https://landscape.coac.net/parques-del-rio-medellin

Medellín, Colombia, Parques del Rio.

- City-river connection for equity and sustainability
- 280 trees planted to enhance the urban environment
- Medellín as an eco-city and a refuge for biodiversity

Global Context: Learning from South Korea

Holistic City Planning: Integrating Nature Based Solutions, People, and Technology

Cheongyecheon River

- It is a tributary of the Han River.
- It is 5.8 km long.
- It flows into the Yellow Sea.

Global Context: Learning from South Korea

Holistic City Planning: Integrating Nature Based Solutions, People, and Technology

Context: Smart Cities

A holistic and interdisciplinary approach in harmony with life

Improving Quality of Life

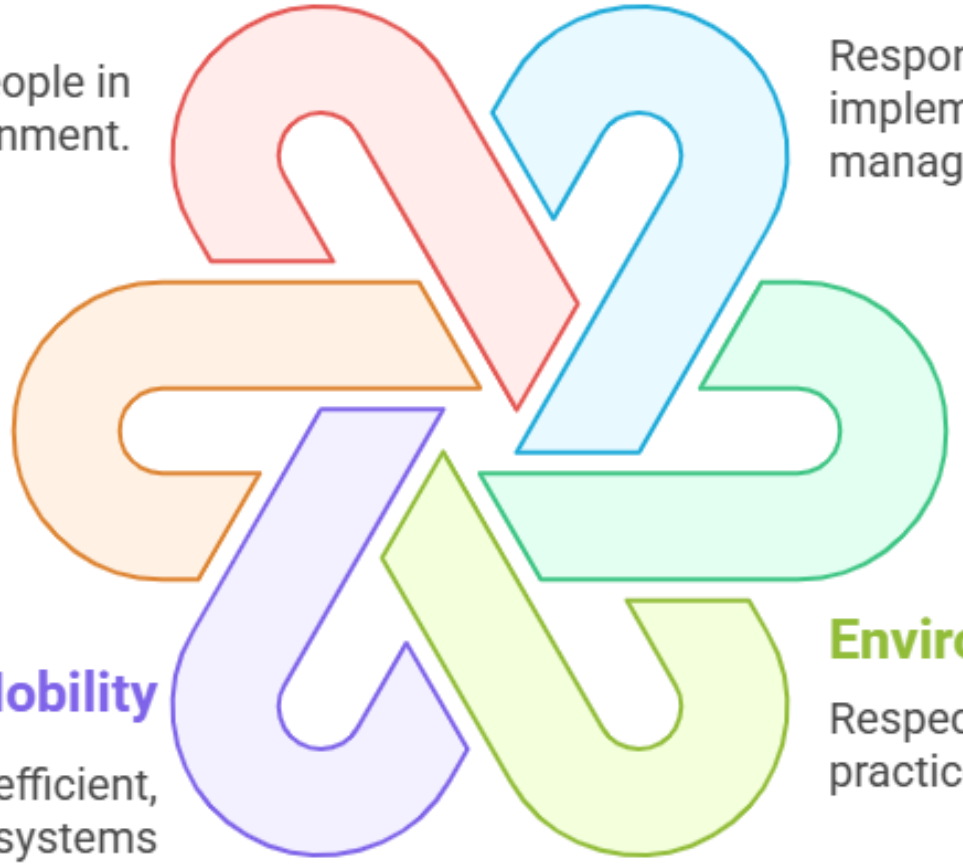
Improve the well-being of people in harmony with the environment.

Participatory Policies and Governance & Strategic Alliances

Inclusive policies, involve citizens in decision-making, and form strategic alliances.

Smart Mobility

Inclusive mobility and efficient, connected transportation systems



Innovation and Technology

Responsible use of AI and data science, implementation of solutions for energy management, and utilization of biotechnology.

Urban Planning

Design of urban spaces for resilience, considering mixed-use development and proximity.

Environmental Sustainability

Respect for natural ecosystems and practices to minimize ecological impact

Justification: a global and local perspective

Population Growth

Seventy percent of the population will live in cities by 2050

Latin American Urban Challenges

Common urban challenges and opportunities in Latin America.

Multidisciplinary and Interdisciplinary Approach

Academic, social, public, and private organizations

Public Policy Governance

Importance of public policies and effective governance.

Sustainable Mobility

Promotion of sustainable and inclusive mobility solutions.

Life at the Center and Creating With Nature

First life, then spaces, then buildings (reversing it never works).

Educational Program Deficit

Lack of educational programs addressing smart cities.

Sustainable Urban Planning

Focus on sustainable urban planning practices and circular economy.

Emerging Technologies and Innovation

Leveraging emerging technologies and innovation to meet real population needs.

At Icesi University, the Barberi School of Engineering, Design, and Applied Sciences fosters talent and knowledge to empower academic, social, public, and private organizations

Main Objective

To provide participants with an understanding of the strategic use of technology for the design and management of sustainable urban solutions, recognizing the key role of nature and ecosystems as living infrastructure for resilient and smart cities. The program promotes an multidisciplinary an interdisciplinary approach to identify fundamental concepts in urban planning, inclusive mobility, public policies, governance, and environmental sustainability, integrating biodiversity, ecosystem services, and nature-based solutions.

Specific Objectives

- Identify the principles of smart cities and their integration into sustainable urban planning
- Describe emerging technologies such as Data Science, IoT, and AI applied to urban management
- Distinguish sustainable mobility solutions and their relationship with urban design
- Recognize key concepts of renewable energy and biotechnology in urban ecosystems
- Observe and analyze public policies and alliances that promote sustainable cities in Latin America

Modules of the Diploma

Sustainable Urban Planning

Focuses on innovative models for sustainable urban planning

4 Classes

Emerging Technologies and Data Science

Explores the role of emerging technologies and data science in the development of smart cities

5 Classes

Inclusive Mobility and TOD (Transit-Oriented Development)

Highlights the development of transit-oriented transport for inclusive mobility

4 Classes

Innovative Energy Systems and Biotechnology

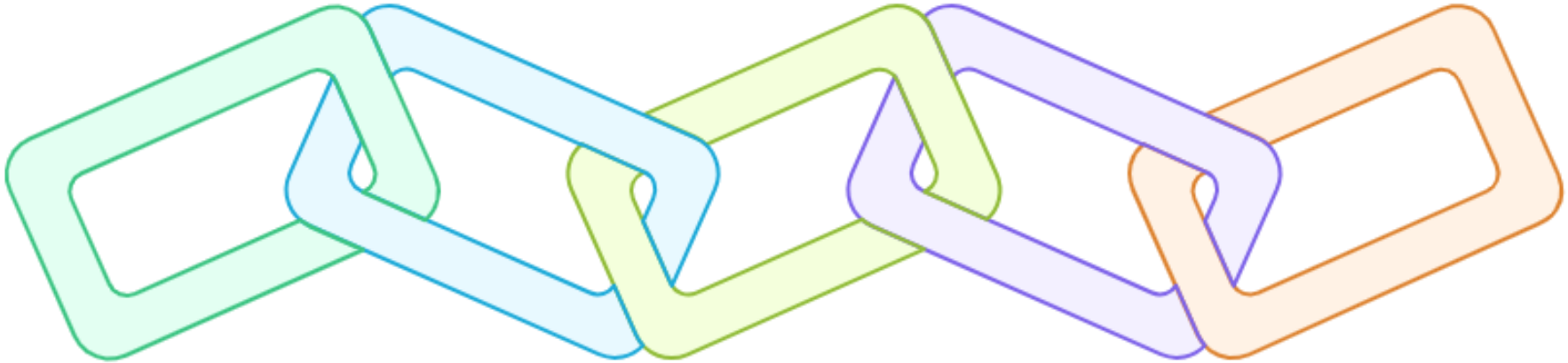
Covers innovative energy and biotechnology systems for sustainable urban ecosystems

7 Classes

Public Policies, Governance, and Public-Private Alliances

Discusses public policies, governance, and public-private alliances for smart cities.

4 Classes



Module 1. Sustainable Urban Planning: Innovative Models for the Present and Future of Cities

Class 1: Evolution of Urbanism - Historical Perspective and Lessons for the Future

Analysis of the evolution of urbanism and lessons learned, with examples of cities

Short-Distance Cities, 15-Minute City, Soft City, Superblocks

Class 2: Compact and Sustainable Urban Models

Class 3: Collaborative and Participatory Urban Design for Urban Regeneration

Innovative Approaches: Tactical Urbanism, Urban Acupuncture, and Place Making

Urban Norms that Regulate the Transformation of Cities

Class 4: Urban Planning and Management for Sustainability

Module 2. Smart Cities: Emerging Technologies and Data Science

Class 1: Smart Cities - Definition and Fundamental Principles	Introduction to smart cities from a technological, social, and ecological perspective, with analysis of international cases
Fundamentals of Data Science Applied to Urban Planning and Use of Open Data Platforms	Class 2: Data Science in Urban Management
Class 3: Artificial Intelligence in Smart Cities	Basic applications of artificial intelligence in urban services such as traffic, waste management, and security
Role of Digital Platforms and Open Data in Urban Governance and the Improvement of Quality of Life	Class 4: Digital Platforms and Citizen Participation
Class 5: Rivers, Cities, and Ecological Transition	Analysis of the historical and contemporary role of rivers in urban configuration. Tools such as satellite maps and AI are examined to understand the urban landscape

Module 3. Inclusive Mobility and Transit-Oriented Development (TOD)

Class 1: Evolution of Mobility and Urban Transformation

Historical perspective and lessons for the future

Principles of Inclusive Design and "Complete Streets" for All

Class 2: Mobility and Urban Design for Community Well-being

Class 3: Transit-Oriented Development (TOD) and Planning of High-Density Zones

Promotion of a polycentric city model planned around its public transport systems

Distribution of Goods and Services, Challenges in Cities and Strategies for Improvement..

Class 4: Urban Logistics for Efficient Mobility

Module 4. Energy and Biotechnological Alternatives for Sustainable Urban Ecosystems

Class 1: Introduction to Sustainable Urban Ecosystems

General description of sustainable urban ecosystems and their importance

Exploration of sustainable energy sources in cities.

Class 2: Sustainable Energy Systems in Smart Cities

Class 3: Biochemical Applications in Urban Ecosystems

Bioremediation of contaminated soil and water.

Production of biogas and biofertilizers from urban waste

Class 4: Waste Management, Bioenergy, and Sustainable Urban Gardens

Class 5: Ecosystemic Urbanism for Sustainable Cities

Concepts and principles of ecosystemic urbanism.

Low-tech and high-tech technologies with NbS for climate change mitigation and adaptation

Class 6: Innovative Nature-Based Solutions and Technology for Urban Sustainability

Class 7: Circular Economy in Cities

Design with purpose, prolong use, regenerate the environment

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Module 5. Public Policy, Governance, and Public-Private Partnerships for Smart and Sustainable Cities

Class 1: Introduction to Urban Public Policies and their Relation to Sustainability

Integration of social, economic, and environmental sustainability in public policies

Optimization of displacements in cities

Class 2: Mobility Public Policies

Class 3: Public Policies for Urban Planning

New urban agenda, SDGs, smart growth.

Data analysis systems and informed decision-making.

Class 4: Urban Governance Technologies and Public-Private Alliances for Innovation

Thank You

First life, then spaces, then buildings (reversing it never works)

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