Students Reinventing Cities

La Esperanza/El Señor del Árbol, Quito

Special Plan for the Monjas River (under development)

La Esperanza and El Señor del Árbol are located in the lower basin of the Monjas River in the north of the city of Quito and are part of the Special Plan for the Monjas River's intervention areas.

La Esperanza is close to a central neighbourhood and therefore has public transport options, a shopping centre, and various amenities nearby.

However, there are no accessible recreational facilities in La Esperanza itself. In addition, a large sewage and rainwater collector system ends here, making it one of the areas most affected by the erosion of the river. This has put both homes and important infrastructure such as the Pfizer Wall and the Carcelén heritage estate at risk. Along the left bank of the river in La Esperanza, you will find a residential settlement and a large plot of former industrial land could be redeveloped. On the right bank, there is a largely unused rural estate that contains some high-rise housing.

El Señor del Árbol is located in the rural parish of San Antonio, on the outskirts of the city of Quito. It is relatively close to the central area of Mitad del Mundo, which connects it to public transport, tourist attractions, plazas, parks, and various amenities. However, like La Esperanza, the neighbourhood itself lacks facilities. There is also an informal settlement that is partially at risk due to the erosion of the river and its slopes.

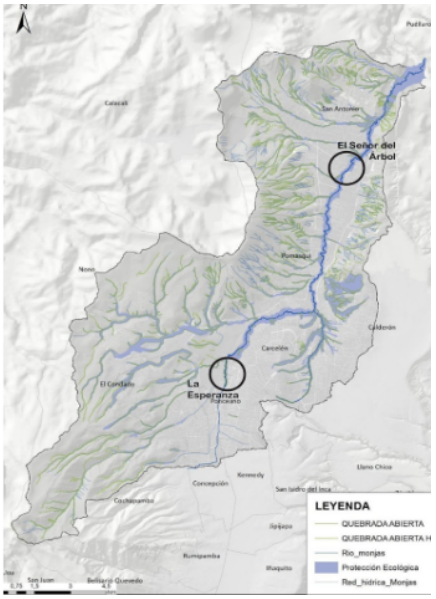

Figure 1) Site Locations. Source: Municipality of the Metropolitan District of Quito

Site Area:
25.4 ha - La Esperanza
35.6 ha - El Señor del Árbol

Key Information:
The total population of the Special Plan for the Monjas River's intervention areas was estimated at 97,735 inhabitants in 2021.

Priority areas & main expectations: The challenge in these areas is to develop a proposal that promotes sustainable development, rainwater management, and blue-green infrastructure by developing an urban model that could be replicated in other parts of the city with similar characteristics.

The proposal should consider the main objectives of the Special Plan for the Monjas River, which are: risk prevention and mitigation, recovery of the river's ecosystem, safe habitat management, promotion of environmental and social stewardship, increasing of green areas and applying nature-based solutions as adaptation measures.

Presentation of the Site and Development Expectations

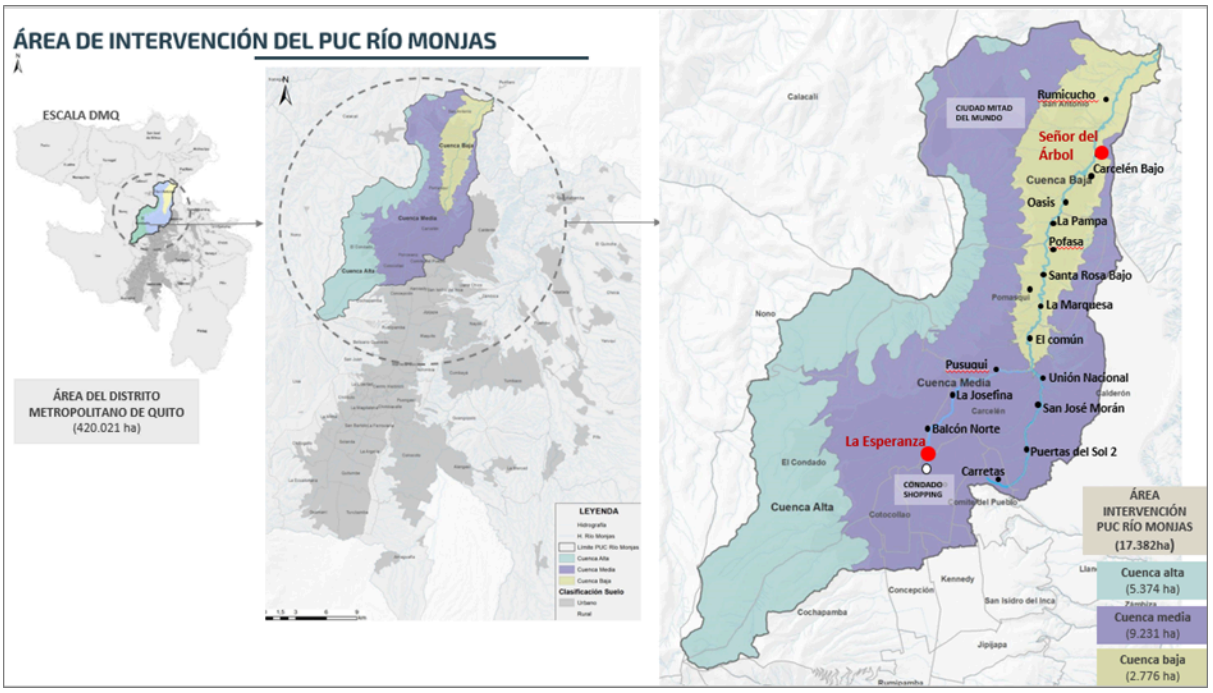

Figure 2) Location of the Monjas River Plan - Municipality of Quito within the Municipality of Quito.
Source: Municipality of the Metropolitan District of Quito

The intervention area of the Monjas River Special Plan is around 17,000 ha and is located to the north of the city of Quito. The sector of La Esperanza is located in the middle basin of the Monjas River and the sector of El Señor del Árbol in the lower basin of the Monjas River.

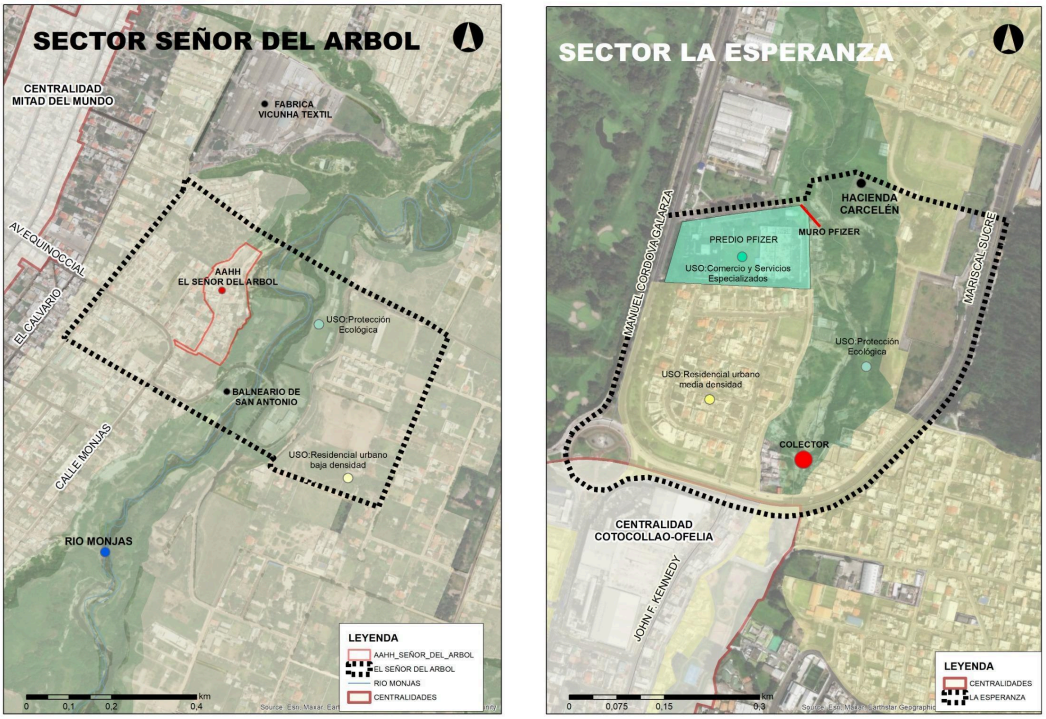

Figure 3) Location of the selected sectors within the Monjas River Special Plan.
Source: Municipality of the Metropolitan District of Quito

Manuel Córdova Galarza Avenue and the large Quito Tennis and Golf Club site border La Esperanza's west side, whilst to the south and east you will find Mariscal Sucre Avenue, the Pfizer Laboratories site and the Casa Hacienda Patrimonial Carcelén on the north. To the south, it borders the Cotocollao - La Ofelia Centre and the Condado Shopping Centre. Towards the southern edge of La Esperanza is one of the city's largest rainwater collectors. This structure discharges rainwater and sewage into the river, contributing to erosion, landslides and damage to private property.

On both sides of the river, some houses are at high risk of sliding down the slopes of the river, especially the Carcelén estate. The owners of this property sued the Municipality of Quito for the effects of river erosion, and as a result, the Constitutional Court issued the 'Monjas River Case' ruling. A Pfizer laboratory is also located within the area. The owners have expressed their willingness to leave the property, meaning that the building has great potential to be repurposed.

Figure 4) Photos of La Esperanza (from left to right: farmhouse, 'El Colegio' collector/dissipater and discharge of sewage and rainwater directly into the river from a house in the settlement).
Source: Municipality of the Metropolitan District of Quito

In El Señor del Árbol northern border, you will find Conjunto Intiñan and Beatriz Colango Streets. To the south are Chaguar and Burbano Streets, to the east by Lulumbamba Street and to the west by Zopozopagua Street. To the west it is connected to the Centralidad Mitad del Mundo by Equinoccial Avenue, and to the north it is close to the Vicuña textile factory. Balneario de San Antonio - a playground managed by the city government- is located within the area, and is frequently flooded in times of extreme rainfall. A growing informal settlement 'El Señor del Arbol', consists of various dwellings at risk due to severe slope erosion.

Figure 5) Photos of El Señor del Árbol(from left to right: flooding of the Monjas riverbed and de facto settlement at risk from slope erosion). Source: Municipality of the Metropolitan District of Quito

Objectives & Strategies of the Special Plan for the Monjas River

The rapid expansion of the city in the last decade and the increase in impermeable surfaces have increased the flow of rainwater into the Monjas River basin. In La Esperanza, both rainwater and sewage are pumped into the Monjas River through a drainage system, leading to the river's erosion and subsequent slope collapse. These conditions have led to the Monjas River becoming the most polluted river in the city, impacting residents, their homes and other property. For this reason, in January 2022, the Constitutional Court issued sentence No. 2167-21-EP/22, which ordered the elaboration of the Monjas River Complementary Plan to guarantee a healthy and ecologically balanced environment in connection with the right to a safe habitat.

The Monjas River Special Complementary Urban Plan compliments the city's Land Use and Management Plan and seeks to provide a comprehensive response to the city's water management challenges. To this end, strategic axes, general principles and strategies aimed at reducing disaster risks, contributing to environmental and socio-economic sustainability, and recovering and rehabilitating the Monjas River basin and its ecosystems have been developed. Teams should develop projects aligned with the following guidelines:

Strategic Axes of the Plan:

1. Risk prevention and mitigation.
2. Recovery of the Monjas River basin ecosystem.
3. Management of safe and quality habitat in a territory resilient to climate change.
4. Management of water resources in the basin to guarantee a clean, healthy and safe territory.
5. Promotion of environmental and social stewardship.

Within Axes 3 and 4, the main strategies applicable to this competition are:

- Increasing permeable land to build an urban green network (Blue Green Infrastructure).
- Applying standards for rainwater management and environmental sustainability.
- Integrating nature-based solutions and sustainable urban drainage systems.
- Developing rainwater management systems that retain, store, and deliver water appropriately to river channels.

One of the principles of this plan most applicable to the competition is the strengthening of the **urban green network** in the Monjas River basin. Students must consider the city's wider plan to develop the Monjas River's green network into a large linear park, and how their ideas relate to this wider strategy. Figure 6 (below) illustrates the study areas of this competition in relation to the urban green network proposed in the Monjas River Special Plan.

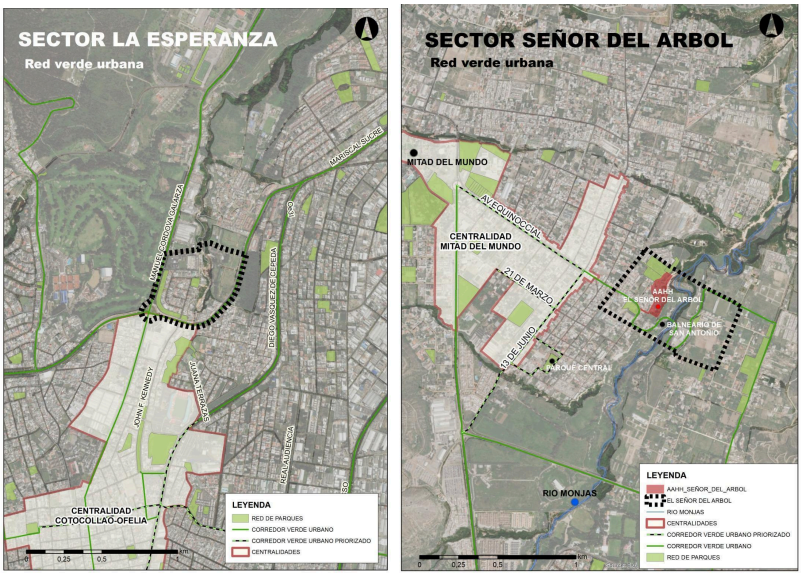

Figure 6) Study areas in relation to the urban green network outlined Monjas River Special Plan.
Source: Municipality of the Metropolitan District of Quito

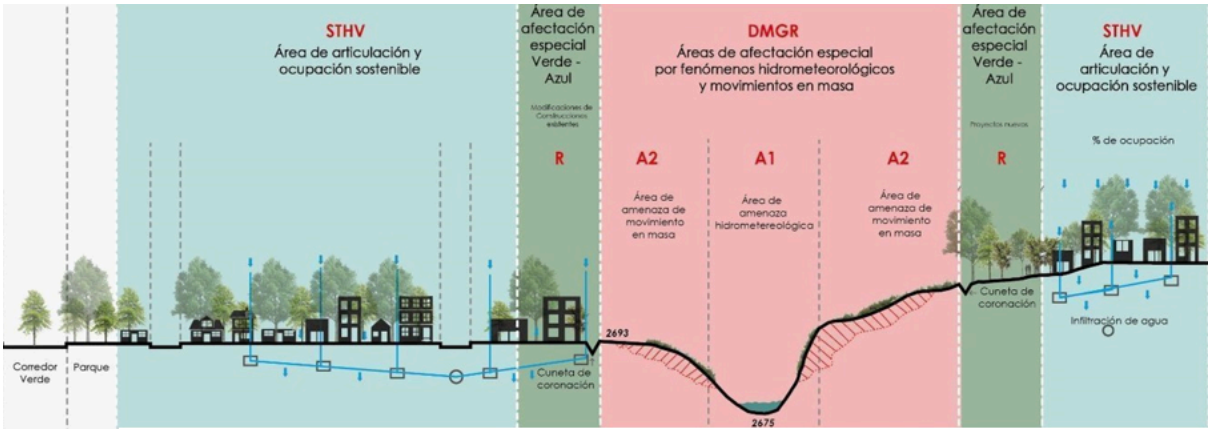

Figure 7)Section of the Monjas riverbed proposed by the Monjas River Special Plan.
Source: Municipality of the Metropolitan District of Quito - Metropolitan Directorate of Territorial Planning.

As shown above, the Special Plan for the Monjas River aims to transform **three main areas** along the riverbed, following the Metropolitan Blue Green Infrastructure Ordinance guidance outlined in the municipal regulations.

1. (Red) Total protection of areas affected by hydrometeorological phenomena and mass movements. No new constructions can be developed due to high risks.

2. (Green)In blue-green zones, future constructions are prohibited. Revegetation is proposed to create a 'buffer area' before the risk zone (in red).

3. (Blue) Sustainable urban development is permitted, considering the following:

- Permeable surfaces are increased to better integrate urban-green networks and mitigate the lack of green recreational areas in neighbourhoods, sectors and zones (as illustrated in Figure 6.)
- Increase vegetation cover, collection and reuse of rainwater, and application of nature-based solutions.
- Development of green corridors with application of sustainable urban drainage systems.

Students are expected to submit the documents required in the competition which include the **project plan**, a **graphic presentation**, and an **implementation plan**.

In their projects, teams should propose a **sustainable urban model** for the two sites - La Esperanza and El Senor del Arbol - taking into account the strategies of the Monjas River Special Plan. Students should focus on the two primary objectives of this competition.

Developing a sustainable urban model

- Integrating rainwater management infrastructure and increasing vegetation cover.
- Ensuring that buildings and public spaces adhere to sustainability standards.
- Improving quality and access to green public space and recreational sports facilities (e.g. parks, sports fields). Interventions should integrate rainwater management, collection and drainage; for example, new recreational facilities could be proposed that include surface rainwater storage systems.

Recovering areas along the banks of the river

- Increase vegetation cover.
- Consider the plan for the linear park along the Monjas River as the backbone of the urban green network. Proposals should consider reforestation, planting native species and increasing the involvement of stakeholders and the local community.

In their proposals, students should remember that the river water is currently polluted. It is expected that Quito's will remain contaminated for the next 25 years.

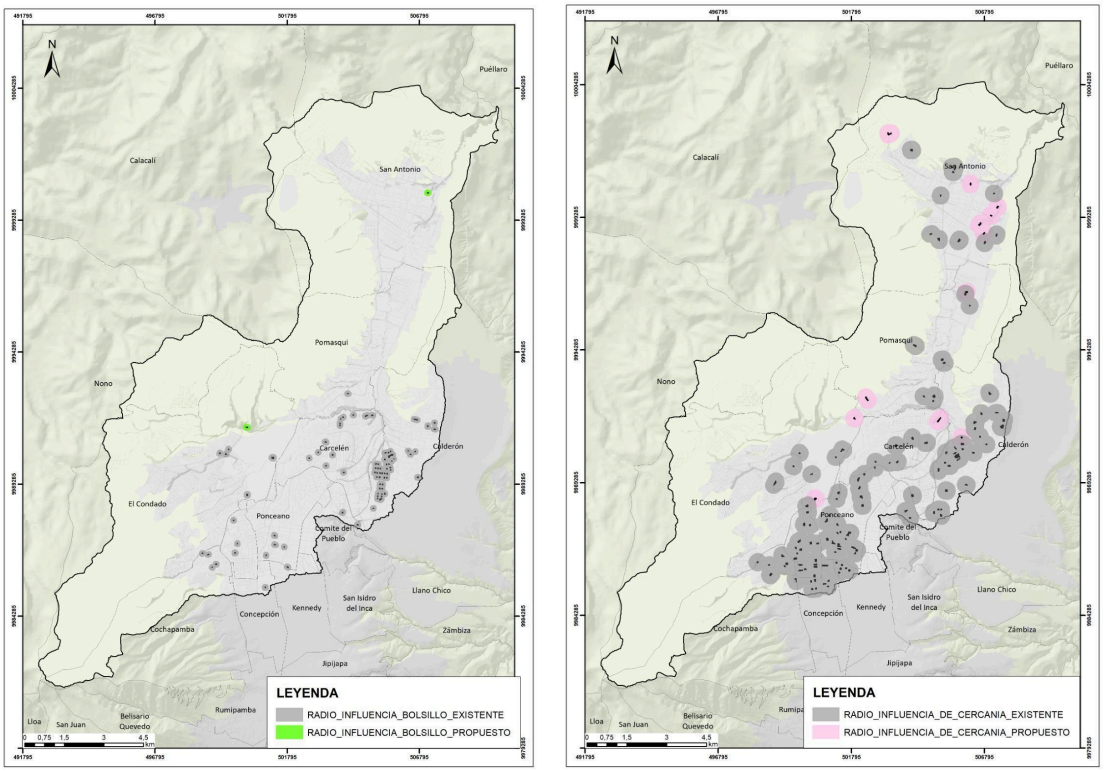

Figure 8) Analysis of the existing coverage and proposed recreational facilities of the Monjas River Special Plan (on the left, pocket or neighbourhood parks, and on the right, proximity parks).
Source: Municipality of the Metropolitan District of Quito

City Climate Priorities and Specific Environmental Challenges

The following climate challenges faced in the study areas should be taken into account:

- **Extreme rainfall events**. Increased intensity and duration of rainfall which causes erosion along the river banks and risk of slides.
- **Risk of runoff** onto roads and public spaces. This is caused by the soil in the river basin becoming impermeable in extreme rainfall events.
- **Landslides** along the slopes of the Monjas River. These are caused by the *El Colegio* water collection and drainage system overflowing and spilling water into the river in extreme rainfall events.
- **Flooding** caused by extreme rainfall in El Señor del Arbol. Flooding occurs within the riverbed itself and does not affect the neighbourhoods on the upper edge of the stream due to the depth of the river, However, Antonio de Pichincha spa and waterpark that is owned by the municipality is particularly affected. r.
- **Water pollution** in the Monjas River The water of the Monjas River exceeds acceptable pollution levels and is the most polluted river in Quito.

Quito's Climate Action Plan 2020 (PACQ) presents a set of strategies, programmes and projects for a long-term vision to 2050. The PACQ presents Quito as a carbon neutral and resilient territory in the face of current and future impacts of climate change. The plan emphasises the responsibility, inclusion and participation of citizens of all ages. In order to move towards a new urban model, the PACQ proposes three main objectives to integrate into Quito's climate change policies:

1) Reducing the city's carbon footprint.
2) Using nature-based solutions (NBS) to boost resilience and reduce social vulnerability
3) Guarantee the health, wellbeing and quality of life of all citizens.

For the purposes of this competition, students should consider the following climate actions of the following sectors:

1. **Sustainable Buildings and Urban Growth Strategies**: The following actions reduce climate risks by promoting temporary rainwater retention (to reduce pressure on urban drainage systems in extreme rainfall events), rainwater reuse (to decrease dependency on the public drinking water network) and increased vertical and horizontal vegetation cover (to reduce the urban heat island effect).

    - *Climate compatible standards* so that buildings and public space are adapted to future climate conditions.
    - *Eco-efficient neighbourhoods and parks* that compliment sustainable housing projects. For example, public facilities, green areas and meeting spaces.

    These actions have further activities such as integrating nature-based solutions and strengthening the urban green network.

2. **Integrated Water Resource Management**
    - *Adaptive Water Management*. Reducing climate risks through integrated water resource management, nature-based solutions and improving drainage systems.
    - *Resilient infrastructure*. Improving blue and grey infrastructure to mitigate the impact of extreme precipitation, such as flooding and landslides.

These actions lead to further activities such as sustainable urban drainage systems and treatment plants to decontaminate rivers.

3. **Environmental Services**
   - *Sustainable land management and provision of environmental services.* Promotion of ecological restoration processes and the recovery of environmental services to increase carbon sinks in the city. For example, reforestation, community and stakeholder engagement.

4. **Sustainable Mobility**
   - *Active mobility for an active city.* Develop permanent cycle lanes by closing roads for cars, adding cycle lanes to main streets, expand the cycle lane network, integrate parking infrastructure and repair stations.

5. **Inclusive and equitable climate action**
   - Urban regeneration and nature-based solutions

Specific Planning Rules and Regulations

In relation to the fundamental norm of the Ecuadorian State Article 14 of the **Constitution of the Republic of Ecuador** establishes that:

> *"The right of the population to live in a healthy and ecologically balanced environment, which guarantees sustainability and good living is recognised".*

On the other hand, Article 66 (27) eiusdem, in relation to the rights of liberty, mentions that:

> *"The right to live in a healthy, ecologically balanced environment, free of pollution and in harmony with nature, is recognised and guaranteed to all".*

Furthermore, Article 276(4) eiusdem mentions that:

> *"The development regime shall aim to restore and conserve nature and maintain a healthy and sustainable environment that guarantees individuals and communities equitable, permanent and quality access to water, air and soil, and to the benefits of subsoil resources and natural heritage".*

Finally, Article 376 eiusdem mentions that:

> *"In order to make the right to housing, habitat and environmental conservation effective, municipalities may expropriate, reserve and control areas for future development, in accordance with the law."*

In relation to the regulations of the decentralised autonomous government of the Metropolitan District of Quito. Article 3714.1 of *Title VI* of *the Green-Blue system* of the **Municipal Code for the Metropolitan District of Quito**, states that:

> *"The general considerations of the Green-Blue System are: the regulatory framework and guidelines for the integrated management of the components of the green-blue infrastructure of the Metropolitan District of Quito, in a coordinated and articulated, dynamic and adaptive manner through the establishment of the Green-Blue System, for the conservation of biodiversity, the reduction of risks, mass movements and the strengthening of resilience to climate change*".

On the other hand, paragraphs b), d) and e) of Art. 3714.1 referring to "The purposes of the Blue-Green System", define the purpose of the Blue-Green network:

> "*(b) Expand, enrich and conserve green spaces in order to increase environmental and social resilience to the effects of climate change.*
> *d) Promote sustainable territorial planning, preventing the development of land and buildings in areas at high risk from hydrometeorological phenomena and mass movements".*

e) Incorporate nature-based solutions and sustainable urban drainage systems SUDs, in the public space of public and private infrastructure for the proper management of runoff and soil permeability of the Metropolitan District of Quito.

Regarding the areas of affectation, Art. 3742 indicates that the ***area of special affectation due to hydrometeorological phenomena and mass movements*** is composed of the geographic accident of the edge of the stream or slope, the zones with hydric threat and with threat of mass movements. The affectation implies the prohibition of building and prohibition in the issuance of the Unique Metropolitan License for the exercise of Economic Activities (LUAE). Compatible agro-ecological activities will be restricted and their authorisation implies an analysis of soil stability.

Art. 3743 states that the ***special blue-green affected area*** corresponds to the area adjacent to the area affected by hydrometeorological phenomena and mass movements. It will be defined only when the area affected by hydrometeorological phenomena and mass movements is identified. The affectation implies the prohibition of building. Occupation will be allowed only with temporary and removable architectural elements and urban furniture.
Only ecological and agro-ecological activities may be carried out in this area, in accordance with the provisions of the Land Use and Management Plan. Only vegetation enclosures are allowed in this area and revegetation aimed at the recovery of vegetation cover and the development and implementation of nature-based solutions is mandatory.

In relation to local urban planning regulations, the document containing the "***Reglas técnicas de arquitectura y urbanismo, Tomo 2. Edificabilidad"***, *for the Metropolitan District of Quito,* determines the technical conditions that must be met by buildings on both urban and rural land in Quito. This volume mentions:

"1.8.3 Sewage drainage: Sewage or sanitary drainage corresponds to the management, control and proper conduction of water used for human consumption, which can be grey or black water.
1.8.3.1 Conditions of application:
A) Wastewater management in urban land classification shall be carried out through the separation of wastewater (sanitary) and rainwater (rainwater) pipes throughout the building system. With the exception of listed heritage buildings.
B) Wastewater management on rural land shall be carried out in accordance with the sewerage system design standard of the company in charge of the service. In case of not having access to direct connection, one of the following mechanisms will be applied:

b. A sewage treatment plant shall be installed to treat the eluate and allow for the discharge of treated water to a water body, ensuring that the quality of water to be discharged complies with current local or national standards.
c. A septic tank shall be installed and the reasons for this level of service shall be stated in the technical report. "

Links to online resources

1. Satellite Map - Secretariat of Habitat and Land Management:
2. Geoportal "Your City Online":
3. Survey results " Special Plan for the Monjas River"

Language Requirements

Students can submit their proposal in English or Spanish.

City-specific Awards

Awards ceremony and recognition for the winning team (*subject to available resources).*