

Master theses (abstracts) in Ecu-MAES

Ms. Alexandra Belen Villacis Chiluisa

Spatio-temporal patterns of urban expansion among main biomes in Ecuador using LULC data from 1990-2018

Over the past decades, the world has experienced an accelerated increase in the number of urban areas due to the population growth. According to the United Nations World Population Prospects 2019 report, the world population reached 7.7 billion by mid 2019, having added one billion people since 2007 and two billion since 1994. In addition, current projections indicate that the global population could increase to around 8.5 billion in 2030, 9.7 billion in 2050, and 10.9 billion in 2100. In the case of Latin America and the Caribbean region, its urban population increased about 240% between 1970-2000. Some statistics indicate that currently more than 80% of the population in this region lives in urban areas, and this number probably increases about 85% by 2040. However, most of the cities created in recent decades are characterized by low population density and lack of planning (United Nations, 2019). According to the Latin American Faculty of Social Sciences Ecuador (FLACSO), 3.4 million inhabitants, which represented about 2% of the total population of Latin America, lived in Ecuador in 1950. Currently, Ecuador is in eighth place with approximately 17.4 million inhabitants (INEC, 2020), which indicates a considerable increase in its population since 1950. This reality creates many environmental, social, and economic challenges to overcome. Therefore, the goal of this thesis is to analyze the spatio-temporal patterns of urban expansion among main biomes in Ecuador using LULC data from 1990-2018. This allows to define the urban areas and understand their behavior, needs, and challenges during the urbanization process. Indeed, remote sensing data, GIS techniques, and statistical analysis were the essential components to achieve this objective. One of the most useful methods to determine urban expansion is *Change Detection*, especially using LULC data, which has been changing rapidly due to anthropogenic activities, such as urbanization and industrialization (Samal & Gedam, 2015). LULC data generated from satellite images (Landsat collection) together with population data from censuses and projections play an important role in urban studies. Once this data was analyzed, it was determined that the urban areas in Ecuador show a constant growth trend that has slowed down in recent years. Due to factors such as the agricultural boom, oil exploitation or internal migration, the Coast and the Amazon have experienced an accelerated urbanization process since the 1950s. Cities such as Guayaquil, Quito, and Nueva Loja had a higher level of urbanization on the Coast, the Highlands, and the Amazon, respectively, than the other parishes.

Ms. Fanny Zhinin

Exploration of a financing mechanism for the protection of water recharge zones

It has been observed that the adequate protection of water recharge areas involves monetary compensation to the owners or the purchase of land in favor of the State. However, the government does not have the resources for the acquisition. It is essential to explore alternative sources of financing, which provide an outlet for the state budget deficit, for example, through the mobilization of private resources. The generation of alternative resources for financing would be possible by implementing land use instruments, which allow the production of resources as a result of compensation for additional urban benefits. In the Ecuadorian case, municipal governments have exclusive competence to regulate urban and rural land use and occupation. However, there are State

agencies that allow modifying municipal land use regulations. For example, in the municipality of the city of Cañar, the Sub Secretary of Lands (a dependency of the central State) has sponsored rural parceling without authorization from the municipal government, which generated atomization of productive agricultural units and a budgetary burden on the local government for the provision of infrastructures for dispersed dwellings derived from the subdivision. This lack of land use policy planning suppresses the potential participation of the municipality in the benefits derived from the rural subdivision of the land. In this sense, as the subdivision and rural occupation in Cañar are an impossible phenomenon to counteract, and since there is a budget deficit to protect water recharge zones, it is pertinent to explore mechanisms to make the urban regulation more efficient flexible in the affected areas. By parceling through land use regulation tools, so that they can mobilize private resources to finance protection. In this sense, it is worth asking whether: Are there instruments in the Ecuadorian legal framework that allow the mobilization of private resources to finance the conservation of fragile ecosystems? And does the mobilization of private resources make the transfer of land ownership in water recharge zones economically viable in favor of the State as a protection measure?

Ms. Wendy Rosero

Between conservation and deforestation. Territorial transformations in a protected tropical Andean landscape

This research focuses on the socio-environmental dynamics derived from the relationship and management of the forests forged by actors' complex and historical connection within the canton "El Chaco" province del Napo - Ecuador. Two populations make up the canton "El Chaco," the colonist population settled in the region for almost 100 years, located between two large protected areas, on the one hand, the Cayambe-Coca National Park (PNCC) and, another part, the Sumaco Napo Galeras National Park (PNSNG) which together represent approximately 75% of the cantonal territory. And the second population corresponds to the indigenous community; Kichua-speaker, "Oyacachi." This community, the owner of significant cultural heritage, has been settled within the upper area of the Cayambe-Coca National Park for more than 500 years. Both populations have been traversed by processes of particular territorialization, deterritorialization, and re-territorialization. In the case of the colonizing population, the territorialization process that arose in the 20th century is part of the concept of safeguarding national sovereignty in space in an international dispute, promoting agrarian reform and colonization of the jungle throughout the Andean Amazon. In this way, the market economy and the well-known "frontier society" expanded, representing the development of agricultural and livestock techniques for the population, which have had substantial repercussions on the environment and forests. This study also addresses the particular deterritorialization processes for populations developed by state instruments, such as creating protected areas in 1970 and 1994. These processes have directly impacted the ways of life and the relationship of these populations with the forest. Over the years and the presence of NGOs and public institutions, an attempt has been made to reverse the patterns of deforestation and destruction of natural resources towards techniques for the integral management of farms, which are economically and environmentally sustainable. The evidence shows a slight but encouraging change in the control and use of natural resources, reversing the deforestation process towards protecting and conserving forests.