Quito, a city in the middle of a firebelt

Since the native vegetation that surrounded Quito was destroyed to make way for eucalyptus and pine plantations, the forest fires that the city faces year after year have been intensifying.

Ecuador, a Latin American country located in the middle of the world gets prepared every summer (the dry season) to cope with the possibility of forest fires. During the dry season (from June/July to August/September), several provinces of the country have seen thousands of hectares of native vegetation disappear due to fires, both in forests and moorlands. **The fires generally involve eucalyptus and pine tree plantations, which facilitate and intensify the fire.**

The incidence of fire depends on several factors, such as climate change, and the duration and severity of the dry season. And, according to the authorities who do not analyze the entirety of the problem, it also depends on the mood of moorland arsonists—those people for whom starting and spreading fires is appealing.

However, in order to more deeply analyze the factors involved in forest fires in Ecuador, it is also necessary to analyze the role of exotic tree plantations. Replacing native vegetation with monoculture plantations has devastating consequences on the diversity of species, water sources and soils, as well as on the interaction of local peoples with the spaces they inhabit. **Plantations thus significantly alter the known fire regimens used and managed by inhabitants.**

The situation in Ecuador is serious. According to the Ministry of the Environment, **163,000 hectares are covered with tree plantations, and there is a strong push to expand them,** particularly with species of pine, eucalyptus, teak and balsa. There is a very large budget to effect this expansion, which aims to reach approximately 500,000 hectares. These incentives mainly favor big businesses, at the expense of farmers, forests and water.

Eucalyptus trees consume excessive amounts of water. Each adult eucalyptus tree absorbs an average of 20 liters of water per day. These trees also inhibit the

growth of other plant species that could act as natural fire barriers by retaining moisture. Additionally, **eucalyptus leaves do not decompose easily, but rather remain dry on the ground, providing fuel for fires**. The same is true of its bark and branches. And the essential oils in eucalyptus (and pine), which give them their characteristic scents, are in themselves very flammable substances.

Eucalyptus trees are known as "fire-loving," because they survive forest fires, turn green again and take advantage of the disappearance of other plants—that could have competed for light and water—to grow stronger.

The Eucalyptus Trees that Surround Quito

In the case of the capital, Quito, **native vegetation was eradicated to make way for eucalyptus trees**, creating what is known as the "green belt" of the city. Despite being composed almost entirely of very old eucalyptus plantations, this "belt" has mistakenly come to be considered a forest. This is because the Ecuadorian government uses the FAO definition of forests, which allows monoculture plantations of exotic species to be considered "planted forests."

As a result, these old plantations have not been cut down or received the proper treatment to prevent them from catching fire every summer. The "green belt" is mostly made up of almost 8,000 hectares of eucalyptus plantations, which predominate on the hillsides of Pichincha, and in Píntag, Nono, Conocoto, Alangasí, Amaguaña, La Merced, Pifo, Calacalí, El Quinche and Yaruquí. (1)

The major problem with the plantations surrounding Quito is that their contribution to forest fires increases over time. The impacts caused in 20 years are very different from the impacts caused in 30 or 40 years, because as time elapses, the environmental impacts are magnified. Abandoned plantations become wild; that is, the trees—either by rhizomes or seeds—begin to reproduce themselves, and the new seedlings occupy firewall ditches. The density of the plantation thus increases, leading to a greater accumulation of leaf litter available to spread fires. Tall, thin trees—which occur due to the density of the plantation and the fact that they must compete for sunlight—quickly and easily ignite and spread fires.

Flora and fauna are severely affected by the forest fires that surround Quito. Their restoration, if it is possible, could take a long time. Furthermore, **forest fires trigger other impacts,** such as the emission of gases and smoke containing ozone, carbon dioxide, carbon monoxide, polycyclic aromatic

hydrocarbons, sulfur dioxide, particulate matter and other substances that cause serious impacts on air quality and harm the health of the exposed population.

Fires are therefore also a problem with a social impact, **involving the physical, psychological and economic integrity of the people affected.** In their wake, fires suffocate a large number of people, and destroy goods; this causes an immediate economic imbalance in affected people, **who generally live in the most impoverished and vulnerable areas of the city**.

A Radical Change

If one adds to the above the extreme climatic variations that stem from climate change, **the pressing need to make radical changes to restore forests** is obvious. This involves analyzing the underlying causes of the fires. In conditions of intense drought and high temperatures, native forests—due to their natural stratification in four levels (subsoil, herbaceous, shrub, arboreal)—retain more moisture, propagating less fire than exotic species plantations, which only have one level and a large amount of dry organic material at ground level. The former mayor of Quito admitted this in 2017, after the fires that occurred that year. Yet apparently, every summer we start from scratch.

Some forest fires are the result of human activity: arson, burning garbage, badly-extinguished fires, or even bad faith actions that must be thoroughly investigated. But **old and recent public policies also create the conditions for these occurrences**, such as replacing native forests with tree plantations, or prioritizing reforestation with exotic trees, thinking only about short-term revenues.

Consequently, **a ban must be declared on the expansion of exotic tree plantations**. To achieve this objective, it is necessary to radically change the Ministry of Agriculture's productive matrix, the Incentive program for Climate Resilient Commercial Reforestation, and the Ministry of Environment's "Zero Deforestation" program, which considers that a hectare of logged forest may be substituted or replaced with a hectare of exotic tree monocultures. According to their logic, this would result in net "zero deforestation."

A rethinking of forest management, to gradually modify areas that have been repopulated with pine and eucalyptus toward native formations, is essential. Prioritizing the restoration of ecosystems native to each area is essential. This should take place using a *minga* approach, with the participation

of people and communities near the affected areas. (2)

Different citizen voices are demanding that the ecological and social crisis that we are experiencing be treated through holistic measures. These could include community monitoring to prevent fires, adequate management of watersheds and streams, training in forest fire prevention in vulnerable areas, urban policies aimed at increasing the porosity of city soils, and waste-reduction campaigns in urban and rural areas, such as the "Zero Waste" proposal. (3) All of this should be part of an integrated State policy to prevent forest fires and other disasters.

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(1) http://revistas.usfq.edu.ec/index.php/avances/article/view/134/136

(2) The word "minga" comes from the Quechua indigenous language, and refers to collective work that is done to benefit the entire community.

(3) Workshops on
“Zero Waste”:
http://www.accionecologica.org/component/content/article/2213-basura