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Controlled fire practice with Saraguro indigenous communities in southern Ecuador. Photo: Amazonía sin Fuego Programme

## Ecuador’s Amazonía sin Fuego Programme: a strategy for reducing forest fires

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***“We must rethink our view of fire, accept its presence, learn to live with fire, and change the way we manage land accordingly.”***

### Introduction

Fire has been a part of agricultural, livestock, forestry and cultural activities that have shaped landscapes all over the world for thousands of years. However, uncontrolled fires have caused alarm, destroyed forests and natural wealth, put lives at risk and caused economic losses. In Ecuador, forest fires are defined as “fires that spread uncontrolled over all types of natural or planted vegetation, in natural or rural areas, produced by human action or caused by nature; causing serious environmental, climatic, economic and social damage, to the detriment of the natural heritage. Controlled burns for the disposal of agricultural residues and prescribed burns are not considered as forest fires” (GOE 2019).

Forest fires and climate change constitute a vicious circle, and the outlook is not encouraging. As the number of fires rise, so do greenhouse gas emissions, increasing overall global temperatures and the frequency of

extreme weather events. By the end of this century, the occurrence of forest fires is expected to increase by 50% (UNEP 2022).

This article reports on work undertaken in Ecuador since 2017 that seeks to generate a different scenario through the Programme *Amazonía sin Fuego* (PASF, Amazon Without Fires Program). This includes integrated fire management, and promotes alternatives to the use of fire in the country’s highland and coastal regions.

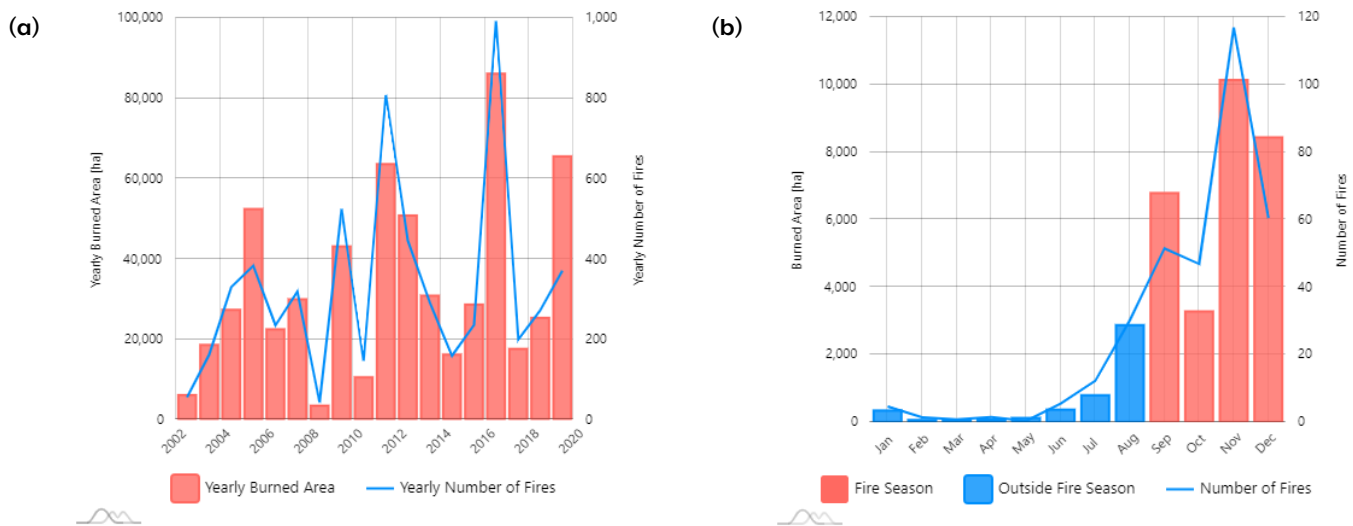
## Fires in Ecuador

Ecuador has exceptional biodiversity, apart from the Galápagos Islands. In its continental Sierra, Coast and Amazon biogeographic regions, there are 91 natural ecosystems covering 15.3 million hectares (ha) — 62% of national territory (MAE 2018) — 65% of which are forested. However, this natural wealth is under increasing pressure, which makes environmental management, land-use planning and the implementation of local and national development plans challenging.

According to the National Risk and Emergency Management Service of Ecuador (SNGRE), forest fires are the most commonly recurring adverse events in the country, making up 38% of such events between 2010 and 2019 (SNGRE 2019). Almost all fires are caused by negligent use of agricultural fires, or are intentionally set during land conversion, hunting, land conflicts, retaliation, vandalism, rubbish burning or other activities. The areas most affected include Andean moorlands, which supply much of the country’s water resources, as well as dry forests, montane forests, and productive agricultural and forestry lands.

Between 2002 and 2019, an accumulated burned area of 598,880 ha was reported from 5,974 different fire events, with most fires occurring between September and December (Figure 1). More than half of this total area was burned in only five of these years, when more than 50,000 ha burned annually (GWIS 2022).

**Figure 1 (a) Annual burned areas and number of fires; and (b) Average seasonality of burned areas (GWIS 2022), 2002–19. Data includes fires in all vegetation types.**



National statistics agencies reported 20,137 fires between 2010 and 2021, which affected 202.618,38 ha (MAATE 2022): 80% in the highlands, 18% in coastal areas, and 2% in the Amazon and island regions (SNGRE 2022); see Figure 2. The most affected provinces were Carchi, Imbabura, Pichincha, Loja, Azuay, Chimborazo, Cañar, Cotopaxi and El Oro.

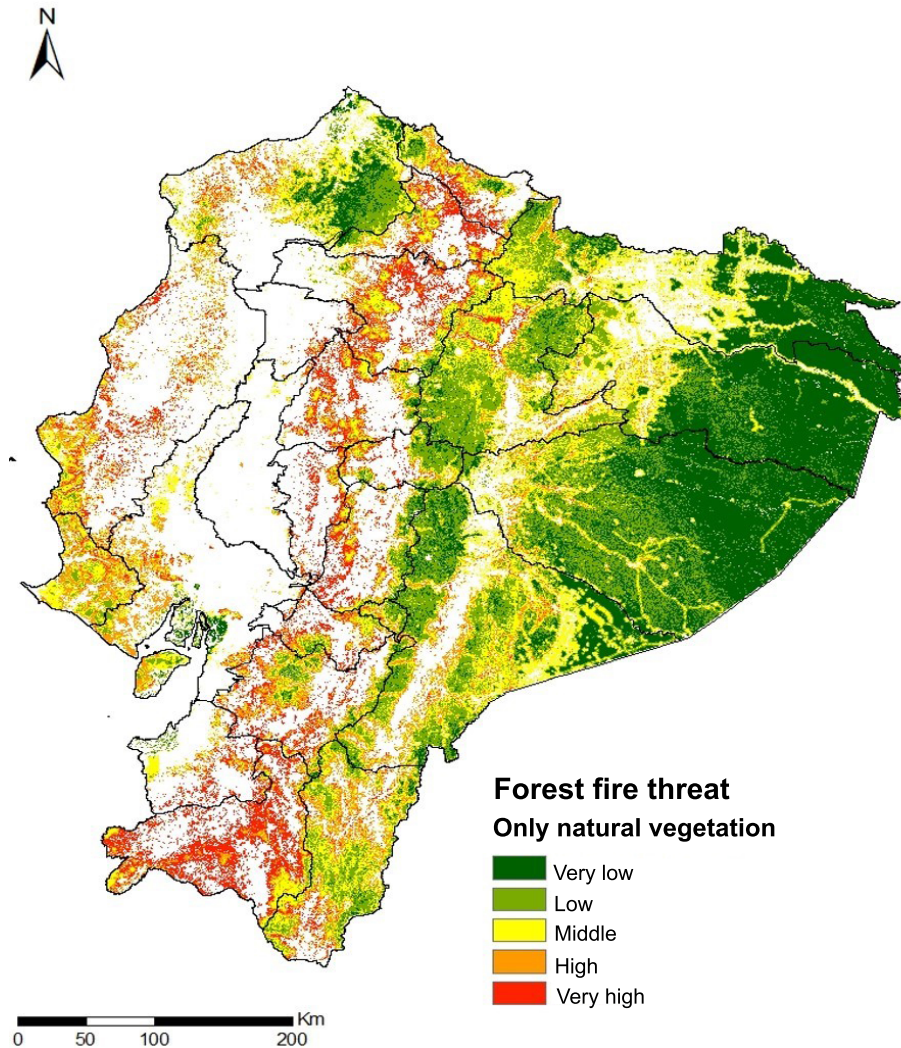
## Integrated fire management

It is clear that forest fires cannot be prevented entirely, but their frequency and effects can be reduced considerably

by applying approaches such as integrated fire management (IFM). The ultimate goal of IFM is to improve the conservation and management of landscapes at risk of fire. To achieve this, society must learn to coexist with fire, change the current perception of the general public and institutions that all fires are bad, and work to achieve fire suppression and prevention instead of the previous focus on fighting forest fires.

With the enactment of the Regulations of the Organic Environmental Code (R-CODA) in 2019 (GOE 2019), the national government took steps to align public policies





**Figure 2. Level of forest fire threat across Ecuador**

and strategies that aim to reduce forest fires, using a broader approach with IFM as its basis. IFM in Ecuador is defined as “the set of technical decisions and strategic actions available for the protection, conservation and sustainable use of natural heritage to prevent and mitigate the harmful effects of forest fires, integrating science and the socio-cultural dimensions with fire management techniques and technologies at multiple levels, without neglecting governance frameworks and the generation of national and local public policies, both forestry and non-forestry, for the incorporation of the IFM approach”(GOE 2019).

Actions to be implemented in the short, medium and long term aim to use fire in a legal, technically appropriate and responsible context. They are also intended to gradually replace the use of “bad” fire by promoting alternatives in agriculture (one of the sectors that causes the most forest fires), and by generating knowledge in society about this approach.

### Applying integrated fire management

The Amazonía sin Fuego Programme (PASF) is the main strategy to prevent forest fires of the Ministry of Environment, Water and Ecological Transition of Ecuador (MAATE) in the country’s highland and coastal regions. It involves multilateral technical cooperation that implements integrated fire management (IFM) practices and alternative fire use (AFU) measures to contribute to environmental protection and to quality of life for rural and indigenous communities. It is implemented in the provinces of Imbabura, Pichincha, Loja (highlands), and El Oro and Manabí (coast), which have the highest incidence of forest fires. The programme builds on work undertaken in Brazil (1999–2009) and Bolivia (2012–2017).

The programme does not fight forest fires, but instead proposes sustainable development alternatives to manage landscapes at risk, recognizing fire as an element of nature that must be managed. The central



Livestock producer Wilmer Enríquez from Loja Province uses fire to clear new areas for his dairy cattle. Photo: Daniel Segura

hypothesis is that the most cost-effective management of forest fires is based on prevention, and involves strengthening the capacity of national institutions and local governments to implement and coordinate actions alongside peasant and indigenous communities, many of whom are traditional and regular users of fire. ASFP is one of few initiatives in the country with a landscape vision that uses interventions based on community management, and that recognizes communities' key role in reducing uncontrolled fires.

To reduce the harmful effects of fire, the programme promotes actions based on five types of intervention. These are: (i) developing national and local planning tools for inter-institutional forest fire management; (ii) continuous fire management training at the institutional and community level; (iii) promoting alternatives to the use of fire in rural areas; (iv) environmental education and awareness-raising on forest fire prevention; and (v) building public policy and governance frameworks in IFM.

## Results and lessons learned

### **Local and national planning tools**

The Amazonía sin Fuego Programme provides planning guidelines for IFM at the local and national level, and developed methodologies were for inter-institutional technical plans for forest fire management (PIFs) for 22 protected areas where the forest fire risk is high. Although PIFs were initially aimed at conservation areas, they are flexible tools that can also be applied to other land at risk, such as forest plantations, farmland and urban interface

areas. This is the first time that IFM has been applied in the National System of Protected Areas of Ecuador; it adds planned actions to the conservation of almost 2 million ha.

In 2018, work began on the first National Strategy for Integrated Fire Management (NSIFM), under a national committee that ensures participatory development. The National Environmental Authority is leading this dynamic process, to establish guidelines and directives to 2030, including protection and conservation actions, and climate change mitigation and adaptation measures. These will be implemented jointly by sectoral bodies and various levels of government, after formalization of this public policy instrument by executive decree expected by 2023.

### **Continuous training at the institutional and community level**

Local and national capacities have been strengthened in multiple aspects related to fire management; these are broader than those involved in the previous focus on firefighting. The aim is to train fire managers and government officers in multiple skills, incorporating an understanding of how territorial and landscape elements influence fire prevention and suppression. However, it has proved difficult to directly link traditional knowledge of fire use by communities with an institutional apparatus dedicated to fire response.

Since 2017, the programme has trained 821 men and women, including 370 brigadistas, who participated in



14 different forest fire prevention and firefighting courses, initially taught by Brazilian experts from PREVFOGO/IBAMA. A certified skills-based IFM training model was introduced in 2020 to train Brigadistas Especialistas en Manejo Integral del Fuego (BREMIF) — specialist units in integrated fire management. Supported by the Pau Costa Foundation (Spain), The Nature Conservancy and the Fire Learning Network (USA), 491 BREMIF brigadistas undertook 11 training courses that provided the necessary skills, knowledge and abilities to organize and perform tasks, and to solve problems in a flexible and autonomous manner. They were also trained to manage fire in coordination with communities and the people who live in the landscape. Training also contributed to the use of uniform terminology, which facilitates communication and reduces ambiguity.

### **Promoting alternatives to the use of fire**

The programme also carries out training and capacity building with peasant and indigenous communities in rural areas that goes beyond the formation of brigades. Focus areas include promoting the adoption of fire-free agricultural practices, providing necessary knowledge to farmers and extensionists about alternatives to fire, and finding a balance between the responsible use of fire based on traditional knowledge while reducing uncontrolled fires that result from poor fire management and planning.

ASFP has promoted conservation-based agricultural techniques through the establishment of ten farmer field schools. The schools incorporate principles of gender equity and equality, reciprocity, self-management and sustainability, and promote the responsible use of fire. More than 100 farming families have been trained and 75 farm plans have been developed for implementing practices that include the preparation and application of organic fertilizers, soil conservation, agroforestry, fruit tree and silvopasture management, holistic livestock farming and ethnoveterinary techniques, among others.

### **Environmental education and awareness-raising**

It has been particularly difficult to develop communication strategies for preventing forest fires, when earlier campaigns were based solely on the absolute prohibition of fire. Such strategies must convey that fire is an element like water or soil that must be managed. ASFP communicates this and clarifies the role of fire in the country's ecosystems and agricultural and forest landscapes, and in the urban interface.

Much effort has been made since 2017 to show the two faces of fire to the public, with the help of local and national programme partners. This includes the development of environmental educational materials and courses on forest fire prevention aimed at teachers in schools and colleges, and talks in schools, universities and communities. During the Covid-19 pandemic, the emphasis shifted to webinars, radio programmes, educational videos and use of social networks. A virtual course (Introduction to Integrated Fire Management) was developed (MAATE 2021), and a national mascot was adopted (Figure 3). Although communication takes place year-round, it intensifies in August to December.



**Figure 3. The national mascot for forest fire prevention in Ecuador, a puma called Urku El Puma.**

### **Building public policy and governance frameworks**

ASFP was aware of the need for a fundamental shift in addressing forest fires from an institutional and regulatory perspective, and worked with MAATE to develop an amendment to the 2019 R-CODA regulation. The IFM approach is now legally recognized as being of public interest and is binding on all levels of government, the private sector and society. The revised regulation provides general provisions and a national and local institutional regime, and calls for the development of specific planning, management and public policy instruments related to forest fire management and IFM. The main challenge now is to ensure that the approach is implemented at different levels of government, and to adopt and internalize it at the territorial level while considering rural communities and their traditional knowledge as being part of the solution.

The ministry, with technical support from ASFP, is working on a range of normative and institutional actions in parallel, over the short, medium and long term. These include the creation of an IFM Unit within the Forestry Directorate of MAATE, enactment of the National Strategy for Integrated Fire Management in Ecuador to 2030, formation of a National Technical Committee on IFM, enactment of the National Fire Management Research Agenda 2030, development of regulations for the use and regulation of controlled and prescribed fires, development of a national programme for integrated fire management, a proposed law on integrated fire management, and development of a national fund for integrated fire management.

## Conclusions

After 20 years of implementing actions in Brazil, Bolivia and now Ecuador, the *Amazonía sin Fuego* Programme has had important impacts on improving fire management. One conclusion is that although forest fires cannot be prevented entirely, their frequency and impacts can be significantly reduced through IFM. In Ecuador, there is now an increased understanding of the need to learn to live with fire, and to protect and manage landscapes at risk while improving livelihoods and the resilience of communities.

Successful approaches must address the causes of fire, incorporating sociocultural dimensions in addition to ecological attributes. Agricultural practices have traditionally depended heavily on the use of fire, which

was seen as an essential tool for clearing land or preparing farmland or pastures before the rainy season. An important aspect of IFM efforts has been to involve farmers and indigenous communities as part of the solution and not just as the cause of fires. Promoting economically viable alternatives to the use of fire must also be supported by the training of fire managers, not just firefighters, in holistic, flexible and appropriate skills.

Developing effective IFM initiatives requires an institutional framework and national and local regulations. Improved decision making and effective strategies need to coordinate, make uniform, maintain and periodically publish national and local forest fire statistics aimed at managers and policy makers. However, limitations remain in monitoring, analysis and interpretation of forest fire statistics, and in knowledge management.

Globally, it is increasingly accepted that it is essential to learn to live with fire (Hernández et al. 2020). Thus, a shift in approach is needed, to accept the presence of fire and change the way that land is managed by communities. This is one of the greatest challenges facing national and local authorities. International donors and national and local actors need to be aware of this, and need to radically redirect their investments in forest fires from emergency responses and firefighting to prevention and integrated management.



Fire brigade trainees after an inter-institutional course on forest fire prevention, Guayas Province, June 2022, supported by IBAMA from Brazil. Photo: Amazonía sin Fuego Programme

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