

## The Fires in the Amazon – How bad are they and how should Christians respond?

In recent years we have tended to hear news of tropical forest fires in SE Asia with their terrible consequences for wildlife and human health. This year fires in the Amazon hit the news. However, there have been many claims and counter claims competing for our attention from inside and outside of Brazil. Here we attempt to set out the facts about the fires and then end with a Brazilian Christian response from what has become a very polarized debate nationally.

### The 2019 Fires in the Amazon

There is an annual fire season in Brazil and neighbouring countries, including within the regions where the Amazon forest is located, and we are part the way through that season now. Existing agricultural land is burned as part of the farming cycle, recently logged forest is burned (once the cut material has dried out) to create new farmland, and standing forests can burn to some degree when such agricultural fires are not properly controlled. So, it is a necessary question to ask whether this years' fires are in any way exceptional or whether the media attention is the product of something else.

We are also living through a period of intense and increasing global awareness of climate change, environmental degradation and species extinction and if the Amazon is famous for anything it is for its connection to the global climate and its high biodiversity. A significant fire season in the Amazon is therefore bound to attract more popular interest than it might in the past. In other words, we may be experiencing a shifting baseline in popular national and global attention to the fate of the world's forests.

The question about the extent and intensity of the fires this season can thankfully be addressed using data that are less subject to shifting baselines or political concerns (though surely not entirely free of either).

Much that we know in a numerical sense about the extent of burning comes from satellites: those that are detecting the heat arising from fires, those that capture visual imagery of smoke, and those that detect change in land cover (e.g. the emergence of burned patches).

There are several different ways of trying to measure the amount of burning that is happening and there are several types of burning that are happening as already noted. It is important to be mindful of both of these as the method of measuring may lead to differing conclusions about trend and comparison with past years; and the type of burning is most critical to the question of impact on the Amazon forest.

Almost all burning in the region is arising from human activity rather than natural causes. The fires being detected by satellites are those that are taking place on existing agricultural land or in forest that has been cleared, usually to create more agricultural

land<sup>1</sup>. It does not appear to be that case that there is a general higher level of burning across all environments as would be expected in a drier year<sup>2</sup> and it is not an especially dry year in the region.

However, satellites often fail to detect fires that are taking place under the forest canopy. It might seem unlikely that such fires are possible because the closed canopy tends to preserve a damp understory that is far less flammable. However, even in closed forests the leaf litter can be dry enough to burn and such low level fires (barely above knee height) can nonetheless be devastating for biodiversity and lead to subsequent high levels of tree death<sup>3</sup>. Tree species in humid forests are very poorly adapted to cope with fire and so are easily killed. The trees that are killed by this modest fire then become fuel if there are subsequent fires. A forest that has ‘only’ experienced a litter fire remains far more vulnerable to subsequent fires than an untouched forest.

Brazil’s satellite-based systems for monitoring deforestation and fires provide an excellent long-term record of annual deforestation so it is possible to compare 2019 with previous years for some metrics<sup>4</sup>. Some comparisons are not yet possible because the fire season is still underway and some of the ways to measure impact have not yet been detectable so soon after the event.

However, it would seem that the fires in 2019 have been far higher than last year and higher than in recent years, so very much against the trend of recent years. Taking a longer timescale it is possible to characterize them as ‘average’ but this includes past seasons of very high deforestation and fire activity which we would hope had long since passed<sup>5</sup>.

So, whilst it is possible to portray this year’s burning as in some way ‘typical’ or ‘unexceptional’ (i.e. you don’t have to go back too many years to find worse, and there is always a fire season in the region), it is very much out of step with recent years and nonetheless alarming. But crucially, it is the connection with deforestation and land clearance that needs our closest attention. This is not so much a problem of fire control, or a particular climatic event, but a direct result of land management practices. Forest clearance is devastating for forest-dependent biodiversity even in the absence of fire.

Keeping on top of the facts of this event can be a challenge and it is clear that there has been a good deal of misinformation around which may be intended to serve a good

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1 <https://news.mongabay.com/2019/09/brazilian-amazon-fires-scientifically-linked-to-2019-deforestation-report/>

2 <https://www.sciencemag.org/news/2019/08/little-bit-everything-burning-nasa-scientist-dissects-amazon-fires>

3 <https://theconversation.com/amazon-fires-explained-what-are-they-why-are-they-so-damaging-and-how-can-we-stop-them-122340>

4 <http://terrabrasilis.dpi.inpe.br/app/map/deforestation?hl=pt-br>

5 <https://earthobservatory.nasa.gov/images/145464/fires-in-brazil>

purpose, but in the end can be discredited. Even attempts to set the record straight can fall foul of their own set of errors<sup>6</sup>.

On one bit of misinformation, it is worth saying something about the Amazon being ‘the lungs of the earth’<sup>7</sup>. It is unclear where this analogy came from and although it might be a useful device to raise alarm it is deeply misleading and implies something that is factually incorrect. Apart from the fact that lungs *inhale* oxygen whereas the analogy is used to imply that the Amazon *exhales* the oxygen we need, the contribution of the Amazon to the global supply of oxygen is rather small. Plants produce oxygen as a result of photosynthesis, using carbon dioxide from the atmosphere. They can’t therefore produce amounts of oxygen far in excess of the carbon dioxide that is available to take in. Oxygen comprises 21% of the atmosphere whilst carbon dioxide is less than 0.1% of the atmosphere, so oxygen coming from plant respiration could only ever make a small contribution to the quantity of oxygen in the atmosphere. What’s more, during overnight respiration Amazonian plants will use up about half the oxygen they produced in the day<sup>8</sup>. It is possible that the Amazon is responsible for 20% of the oxygen that is produced by terrestrial ecosystems, but that is far less significant for us globally than the ‘lungs of the earth’ claim implies.

What is significant, however, is the contribution of the Amazon to global climate amelioration. The Amazon is a large store of carbon but the fires are releasing this. Given that changes in such a small percentage of CO<sub>2</sub> in the atmosphere can nonetheless have such large consequences for global climate it is clear that any additions to the CO<sub>2</sub> level from fires in the Amazon will be similarly consequential. The Amazon can be thought of as ‘air conditioning’ for the planet rather than lungs.

Another misleading comparison that emerged was that the fires were not unique to the Amazon but were also happening in ‘central Africa’<sup>9</sup>. The map displayed to justify this comparison plainly showed a concentration of fire in southwest and south-central Africa well outside of the humid forest zone so in no way analogous to the Amazon. This is a region with more fire-adapted trees unlike the humid Amazon, and fire has been part of the land use cycle for generations.

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<sup>6</sup> <https://news.mongabay.com/2019/08/michael-shellenbergers-sloppy-forbes-diatribes-on-amazon-fires-commentary/>

<sup>7</sup> <https://www.nationalgeographic.com/environment/2019/08/why-amazon-doesnt-produce-20-percent-worlds-oxygen/>

<sup>8</sup> <http://www.yadvindermalhi.org/blog/does-the-amazon-provide-20-of-our-oxygen>

<sup>9</sup> <https://www.forbes.com/sites/lauratenenbaum/2019/08/26/its-not-just-brazil-satellites-show-fires-across-bolivias-amazon-and-in-central-africa-too/#e73466edc8>

## Declaration in defence of the environment – Brazilian Evangelical Christian Alliance

28<sup>th</sup> August 2019

Due to the severe climate and environmental events unequivocally caused by burning and deforestation, we reiterate our commitment to responsible participation of Christians in caring for ‘our home’.

### **We reiterate that:**

1. In God’s original plan for Creation, God instructed man to make use of natural resources in a way that conserves and takes care of them.
2. Among the activities developed by man was the naming of animals, which, in one sense, is understood as the mandate to order and classify Creation, and, in another sense, to do science. Science is an essential activity for development and for the preservation of the environment.
3. The ‘fall’ brought about conflict between the parties: Creator and Creation, humanity being part of and responsible for the latter. Nature becomes ‘hostile’ because of human sin (thorns and thistles) and challenging for human sustenance (bread of adversity). Human sin becomes indirectly responsible for catastrophes and directly responsible for environmental degradation.
4. Nature awaits to be set free and groans as in the pains of childbirth for the actions of God’s children. There is a promise of a new heaven and a new earth where fellowship between God and His creation, man and a new restored nature, will reign.
5. But between now and not yet, it is left to Christians (those saved and redeemed by Jesus Christ) to live out the values of the Kingdom of God in the present, including the expression of God’s love for the essential goodness of His creation.
6. Love is the strongest characteristic of born-again men and women. Love for God, love for our neighbour, love for Creation. Through the cross we have been reconciled with Creation, with Christ and, therefore, with one another. Our relationship with God drives us to care for others by caring for the environment.

Therefore, as Christians who are responsible for ‘caring for the garden,’ we expect consistent policies from our rulers aimed at protecting the environment. Without going into the merits of the questionable actions of previous governments, which did not prioritize environmental protection in their public policies, we are currently witnessing, with much regret, attempts by the government to minimize the destruction of our ecosystem with visible consequences for the climate and for the survival of the planet. We also warn that science should not be viewed as an enemy of environmental protection. There is almost worldwide unanimity about the importance of preserving the



Amazon in order to ensure that the world's climate is balanced. Brazilian scientists have already highlighted the richness of biodiversity and of the so-called 'flying rivers' which are formed over tropical forests. Making the forest unfeasible through deforestation and burning is to declare the death penalty for various ecosystems of our country and the planet. It is time for unity. More than political ideologies and economic interests, we need to defend life.

Source (in Portuguese):

<https://aliancaevangelica.org.br/manifesto-em-defesa-do-meio-ambiente/>

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