

# ***Research on the Impact of South America Rainforest Destruction on Amphibians***

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**Abstract:** South American rainforests are the largest group of rainforests in the world, not only serving as a habitat for more than 7,000 species of animals but also known as “Earth Lungs,” providing huge benefits for humans. One mysterious group of organisms is known as the Amphibians, which are extremely fragile to the environment and affected deeply by the rainforests in South America. Although people try to find ways to conserve and restore the forests and these fragile amphibians, the effort is not enough, and everyone needs to realize its importance to succeed. This paper focuses on the importance of South American rainforests like the Atlantic and Amazon rainforests to amphibians and human beings. Knowing the importance of forests, how they are currently critically damaged by humans, and that the effects of their benefits are declining and severe consequences are showing up. Humans need to start taking actions that can effectively conserve or prevent further damage to rainforests. Actions like reducing, reusing, recycling, planting trees, or government actions like forest corridors and protection emphasis are all feasible ways people can do to help the environment.

**Keywords:** Rainforests, Amphibians, Deforestation, Conservation.

## **1. Introduction**

South America rainforests contain many groups of forests, and some well-known ones are in the Amazon. However, the area of the Amazon is too small compared to the magnificent Atlantic Rainforest. Standing up to 1000km<sup>2</sup>. it is the largest group of rainforests currently standing in South America. Home to an incredibly diverse array of animals, providing a suitable temperature, humidity, and habitat for these unique animals. Providing not only benefits for animals, but also continuously improving air and water quality for humanity. With plants filtering air, water beeping cleaned by roots, and soil held back to prevent erosion, the rainforests bring humans more benefit than we can ever imagine. Indeed, being known as the “Earth’s Lung” is not a joke. But human destruction in the Atlantic Rainforests have been devastating; up to 80% have been lost since the first Europeans arrived in South America [1]. This damage to rainforests has been increasing in the present time. All sorts of fragmentation, deforestation, and water and air pollution can cause huge damage to the landscape, food chain, and native biodiversity of both animals and plants. Lost vegetation in forests will cause major issues for local communities; soil erosion, water, and air quality will all decrease; and one thing people fear, climate change, will also increase at a rapid rate. Without correct information and conservation, more than 40% of worldwide amphibians are endangered [2]. Therefore, this study

attempts to explore the impact of the destruction of the South American rainforest on amphibians, and corresponding protection measures. This study contributes to the protection of rainforests and amphibians, and also lays a theoretical foundation for the protection of both.

## **2. Impact of South America Rainforests of Amphibians**

Up to half of all Amphibian species live in South America; up to a crazy number of 2265 species of amphibians are found in South America [3]. These rainforests in South America provide the ultimate habitat for these animals. The wet and hot climate makes it perfect for amphibians to thrive. Amphibians spend half of their life as tadpoles in water, and the other half as adults on land [1]. This means that they require both water and air quality to be good them to survive, which is already more picky than most of the animals. Amphibians breathe through their skins, and that requires their skin to be constantly moist [4]. For the majority of them, rainforests and forests are the perfect areas for them to live. Constant evaporation from land water sources like lakes and rivers, and respiration from plants make the humidity very high. Adding on to those, vegetation that grows extremely high also covers the surface and prevents water from being lost from the sun. All these factors contribute to the best environment for these animals. Water might only exist in rivers and lakes in some other areas, but in the rainforests of South America, it can also exist in Tree Holes, Plant Bases, and many other small puddles of water. All of which will evaporate and disappear really quick if they are in other parts of the world, but in South America, they can exist way longer than expected. These provide the best nesting sites for the amphibians, the perfect area to lay their eggs and prevent them from being spotted by predators while maintaining moisture for their babies [4].

There are too many benefits for amphibians simply by looking at the climate and habitat around them in South American rainforests. Also, with the moist and hot weather, bugs and insects all tend to thrive, meaning that amphibians, like the ones we know like frogs and salamanders, which mostly feed on insects, would benefit significantly from the high insect population in the forests of South America. With enough food and the perfect climate and habitat to nurse and survive, the South American rainforests have become the world's most abundant area of amphibians. As mentioned above, 2000+ species live in South America, and the worldwide population of amphibians is only 4000+ [3]. This means that half of all known amphibians exist in South America. This means that more than half of the entire world's amphibian population depends solely on South America, and specifically on rainforests. Any damage or disturbance done to the forests that can cause harm to the amphibians is considered catastrophic damage, meaning that any damage done is equal to putting more than half of the entire world population of amphibians in danger. Known as the biggest amphibians reservoir in the world, South America Rainforests play a vital part in the population of amphibians, making it the key factor for amphibians protection.

Benefits in nature often come in double ways. When South America rainforests like the Amazon and Atlantic benefit the amphibian population a lot, the amphibian population also provides benefits back to the rainforests. They play a key role in the vegetation protection of forests. Their diet includes bugs, insects, and small animals that could harm the forest. Their presence limits the number of tree pests, allowing more trees to grow. They also provide more nesting sites and humidity for amphibians, creating a win-win situation [4]. Without insect damage, trees can grow faster than before. This natural form of pest control is undoubtedly the perfect solution to protect vegetation and rainforests from native or invasive insects. There are predators in the forests, like snakes, birds, and many others, that mainly feed on them [1]. This not only prevents the amphibian population from overgrowing but also supports generations of predators that consume them.

### 3. Protection and Conservation Methods for Rainforests and Amphibians

Knowing the importance of South America Rainforests is not enough, us as humans must realize that we are damaging the forest too much. The largest rainforest in South America, the Atlantic, is destroyed up to 80% since the Europeans first encountered it. All these damage need action immediately in order to not only protect the Rainforest Areas but also the fragile amphibians living in them [5].

As we know fragile amphibians are sensitive to not only air, but also water. This makes the one simple and most effective way is to prevent water pollution of local rivers, and lakes. We can also advertise the importance of amphibians in their native environment so natives can prevent polluting environments for them. Many actions can be avoided to prevent water pollution, avoid pouring waste water from kitchens and bathrooms into local rivers can be one way, others like not washing clothes in river to prevent soap from hurting animals, don't litter or throw trash into lakes, and don't waste water, can all be parts of an effective way humans can do to prevent water pollution. For us, we can support in worldwide organization and make sure local native people knows the correct way to protect the landscape. Other activities can also help conserve and restore native forest and amphibians. Planting trees is just one aspect, more are related more closely to amphibians protection. There might be a question asking: why are they decreasing still at a rapid rate despite people knowing their importance? Well, such animals are too fragile to all tiny changes in their environment, which will cause a rapid decline in population, and this results in 42% of the entire world's amphibians are currently at the edge of extinction. Then why are we not doing, or doing so less things that can help or conserve these dying animals? The truth is often disappointing. Scientists are trying their best for conserving these animals, but there are so many factors that become an obstacles in their way for proper protection. There are two major reasons that serves as an obstacle. Government's lack of awareness and lack of funding for scientific research and studies are one of the biggest obstacles in their way. Without local government realizing the importance of amphibians, there barely would be any support, and therefor having the research proceed on extremely slow. That is why it is important to advocate for their protection, both amphibians and forests, to make sure leaders and governments can be award of their importance. But this cannot be all blamed on the government, there are also many natural factors that prevent scientists from effectively protecting the amphibians. Their lifestyles makes them hide often deep in the woods, making it almost impossible for scientists to even reach their living habitat. Without even encountering one, it is not possible to collect data for them, and therefore more difficult to protect or conserve them. Regarding their habitat, one characteristic of amphibians also makes them extremely hard for conservation [4]. Their ability to hide in plain sight, known as camouflage, makes it hard for scientists to collect data, properly identify them, and come up with a precise way to protect them. These amphibians might be just in front of you, but you are still unable to find them. Without precise and definite data on population count, population distribution, and habitat requirements, scientists are unable to estimate or determine the size of their species, and even if they are found, there is too little data available for some rare species to be able to capture and breed them. People try to breed them in laboratories so some endangered amphibians can restore some of their populations.

But obstacles like those mentioned above, only allow scientists to breed some of the amphibians that are already known with accurate data. This means that the most effective way to protect amphibians is, no doubt, to conserve their natural habitat and protect the South American rainforests. Things are already being done by volunteers and people all around the world who care about the environment. Things like planting trees, restoring forests, and preventing agricultural damage to forests are all actions taken. Even though actions like planting trees might seem too little to produce any effect, with all actions done and overlapped, it is still possible to protect the forests. Stopping

local deforestation for agriculture is one crucial way; giving lessons to inhabitants of South America in rural areas is necessary and would prevent them from interfering with the rainforest for agricultural purposes. Another interesting project that would help animals, specifically amphibians, is the forest corridor.

This idea was to connect fragmented rainforests back to one with corridor-like forests that could allow animals to go around. Forest fragmentation might not seem like a big issue for us or for the plants, but for the animals, it is significant. Fragmented forests mean that animals have to be separated and are no longer able to crossbreed with one another [2]. This can cause the genetic pool of species to decline while also making genetic diseases more likely to occur in animals. This can be extremely fatal to them, especially in amphibians [2]. Amphibian skin lacks protection from fungus and bacteria, and without a complete and highly diverse genetic pool, their chance of heritable diseases and lack in immune due to genetic issues will increase dramatically [6]. They are not only vulnerable to air and water but also to natural fungi and bacteria, which usually won't cause a problem if forests are not fragmented. So, building a forest corridor can be seen as a way that humans are trying to restore the native population of animals. Speaking of so many the ways people try to protect, some seem a little too far for us to reach as daily citizens. But what can we do to protect these forests? One crucial idea is: reuse, reduce, and recycle. Reusing the things we buy, especially wood products, can significantly reduce our wood consumption as humans. Humans will consume up to 55.1 million tons of wood in just the second half of 2022. This extraordinary number is real, with no hesitation, and is predicted to grow by over 54% by 2050. That is why humans must start reusing products that can still be used. Reduce is simple; using fewer tissues and wasting fewer resources would be the simplest thing for us as citizens to do. Recycling might be a little harder for people who live in countries that don't pay attention to recycling.

Numerous types of material can be recycled after use, and that includes wood products. All three methods, if we perform them as a whole, can significantly contribute to the conservation of rainforests and reduce the damage done to nature by human beings. This will also help to reduce harmful effects on fragile amphibians. But to save amphibians in forests more effectively, we as citizens also need to pay attention to many other things. Like trying our best to not catch, touch, or stop the pet trade and skin trade, these are just examples of numerous ways of hunting endangered species.

If we go around in nature and spot an amphibian that we do not know, it is best to avoid touching or capturing them. First, because it is an unknown species, it might be harmful to us as humans if it is poisonous. Second, they have really sensitive skins; our hands at 37 degrees might be boiling them, and that will cause significant damage to the amphibians' skin and might be fatal. Amphibians are beautiful in many ways, and they are often attractive to pet owners around the world, causing pet trade and skin trade to happen often worldwide, some with really rare and endangered species of amphibians. It is our duty, and we need to try our best to stop these trades. Our money spent on the purchase of these products is an excuse for people to hunt these poor amphibians. Pouching on endangered amphibians is illegal worldwide and happens most in South America, not only due to the high biodiversity and amazing appearance of amphibians but also the lack of enforcement of laws in rural areas of South America. This is why we need to try our best to prevent them from happening by reporting when seen and, more importantly, not participating in these actions. There are so many things humans can do to prevent, protect, conserve, and restore not only the damaged amphibian population but also the entire rainforest in South America, benefiting both animals and humans.

#### 4. Conclusion

This research studies the impact of the destruction of South American rainforests on amphibians and the corresponding protection measures. It can be concluded that rainforests are crucially important for amphibians in so many ways. They provide the ultimate habitat for them, and with the correct

temperature, humidity, and climate, it would allow amphibians to thrive in them. Also, with the high biodiversity of vegetation, it can draw insects for amphibians' means while also providing a natural nursing house in between plants, making nowhere else in the world a better place for amphibians than the South American rainforests. But as said, benefits come double way; amphibians also serve as a main component of the local food chain; without them, it would collapse. Since they are so important, we must start protecting them. Restoring forests, preventing water and air pollution, reducing resource use, and building projects like forest corridors are all effective ways we can help them. This paper only considered the effects of South American rainforests on the amphibians that live there. Hopefully, future research can expand the scope of the study to include more rainforests and a wider variety of animals.

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