

COLUMBIA GLOBAL CENTERS | RIO DE JANEIRO

THREATS TO THE BRAZILIAN ENVIRONMENT AND ENVIRONMENTAL POLICY

COLUMBIA LAW SCHOOL

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Brazil American Institute for Law and Environment

WORKSHOP REPORT

THREATS TO THE BRAZILIAN ENVIRONMENT
AND ENVIRONMENTAL POLICY

WORKSHOP HELD: NOVEMBER 13, 2019
AT
COLUMBIA LAW SCHOOL

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WORKSHOP REPORT

Threats to the Brazilian Environment and Environmental Policy

Workshop Held: November 13, 2019 at Columbia Law School

Introduction

The Columbia Global Centers | Rio de Janeiro, in partnership with the Sabin Center for Climate Change Law at Columbia University and the Brazil-American Institute for Law and Environment at Elisabeth Haub School of Law at Pace University, organized a Workshop on November 13, 2019 in New York City. The Workshop was convened to discuss and raise awareness of the scope and severity of the environmental crisis in Brazil with a focus on the severe threats to the Amazon.

The consequences of the Bolsonaro government´s environmental actions are serious for Brazil and for the world. That is one of the reasons why the Columbia Global Center in Rio de Janeiro has been promoting this discussion globally and connecting networks of activists and experts in order to promote a safe space for knowledge exchange.

For the Workshop at Columbia, the organizers gathered specialists from Brazil and the U.S. to examine the legal and scientific aspects of a large number of actions taken by the new Brazilian government intended to weaken normative, administrative, and legislative practices that underpin environmental policy. Pressing global issues, such as setbacks to US environmental law, climate change denial, and human rights violations, were discussed from a comparative U.S.-Brazil perspective as well as ways of moving forward.

Participants in the Workshop benefited from the presence of representatives of the Brazilian judiciary, Human Rights Watch, Environmental Defense Fund, the Brazilian National Institute for Space Research, and the New York Botanical Garden.

Finally, we would like to point out that all individuals cited in this report spoke in their own individual capacities, not as representatives of the institutions with which they may be affiliated. Furthermore, in the spirit of a free and open debate, the group as a whole did not endorse any particular policies or put forth any political opinions. Such advocacy or opinions as expressed in this report are attributable only to individual participants.

First Morning Session: Legal Perspectives

David Cassuto summarized the environmental devastation that we are facing in the United States and in Brazil. Professor Cassuto offered thoughts on the "systemic issue we face as we attempt to mediate, mitigate, and stop the devastation and the inevitable march of climate change."

In the United States, the Trump administration to the date of the workshop has rolled back 53 environmental rules and is the process of rolling back 32 more. Pollution is up 14 percent since President Trump took office. One study coming out of Harvard notes that, under the most conservative estimate, the Trump administration's rollbacks and reversals of environmental rules will likely cost the lives of 80,000 U.S. residents per decade and lead to respiratory problems for more than one million U.S. residents. This does not even deal with the horrific impacts of climate change.

In Brazil, President Bolsonaro, before becoming President, was personally fined for violating environmental regulations. He dismissed the idea of setting aside forest-land for native Brazilians. President Bolsonaro promised that "there won't be a square centimeter demarcated as an indigenous reserve" under his leadership. During his campaign, he declared that protected lands were an obstacle to economic growth and promised to open them up to environmental exploitation. As of July 2019, the Amazon has lost more than 1,330 sq. miles of forest cover since President Bolsonaro took office. That is a 39 percent increase over the same period prior. He has ignored the data on deforestation compiled by his own government. He called the preoccupation with the Amazon a form of "environmental psychosis." He rejected millions of dollars of international aid to fight the fires in the Amazon and claimed that the fires were set by pro-conservation NGOs in order to undermine him personally.

President Bolsonoro cut the budget for IBAMA, the Brazilian Environmental Agency, by 24 percent. Under his leadership, IBAMA's enforcement actions have decreased by 20 percent during the first six months of the year, compared to the year prior. He denounced environmental fines as an "industry that needs to be shut down."

Both President Trump and President Bolsonaro dismiss data as lies, including data collected by their respective governments. Both Presidents are climate change deniers.

Professor Cassuto stated: "These two men who sit atop the governments of two of the most important nations in the world from an environmental perspective are cut from the same cloth. They govern from a belligerent, mendacious ignorance. That is their governing strategy." However, Professor Cassuto does not see these two as the actual problem—the fact that they got elected is the problem. They could not be doing what they do were people not inclined to vote for him. What does this mean? Hundreds of millions of citizens of these two countries either do not care, or actually support these men and their policies. That is the problem.

As we try to figure out a solution, we need to start with where we get our information. The media has ceased to be what it was in years prior, which was a source of information for

everybody, regardless of their political orientation. Today, media outlets have been segregated into echo chambers, some of which have no allegiance to the facts and no sense of common purpose. As a result, democracy has grown ponderous and is fed by profit-driven lies. The question is what to do as the planet inexorably marches towards a global catastrophe. We have to fix the cause, or the symptoms (Presidents Bolsonaro and Trump) will linger and they will recur.

Romulo Sampaio addressed the history of Brazil's National Environmental Policy System. Brazil was under a military dictatorship which lasted from 1964 to 1985. One of the justifications of the military coup was to develop the country at a rapid state. To meet this objective, Brail needed international funding, technology, and industries. At the time, there was increased international pressure to protect the environment (the landmark 1972 Stockholm Declaration of the United Nations Conference on the Human Environment). Against that backdrop, in 1981, the National Environmental Policy System was born during the Brazilian military government. Once the environmental laws were in place, and the international community was appeased,

Brazil was not interested in enforcing the laws due to a concern that environmental protection would interfere with the country's development goals.

The resemblance of the past governmental policies to the present is not a mere coincidence. However, there are key differences. The current government was elected through a democratic process and, therefore, military influence cannot as effectively undermine the National Environmental Policy System. Instead, the government is currently undermining the environmental laws by wreaking havoc on environmental NGOs, while at the same time undermining scientists and scientific data. Although the government is aware of increased international pressure to protect the environment, it engages in an "enforcement greenwash strategy" where it will occasionally announce environmental enforcement actions to keep the international community at bay.

There is light at the end of the tunnel. Important sectors of the Brazilian agribusiness are truly committed to environmental protection. Because of the importance of agribusiness in Congress, it constitutes a relevant balance against irresponsible environmental violations coming from the federal government. Second, international pressure really works. Finally, the Public Prosecutor's Office and the Brazilian Judiciary have been key forces in counterbalancing attacks against the country's strong legal regime of social and environmental protection.

Michael Gerrard addressed what is happening in the United States. Donald Trump was not always a climate change denier. In 2009, he signed on to a full-page advertisement stating that the U.S. should join in the Copenhagen climate agreement and act vigorously. Something changed, and through his tweets he began to say that climate change was a "Chinese hoax." In his campaign, he promised to roll back all of the Obama-era environmental protections starting with the Clean Power Plan. He pledged to pull out of the Paris Climate Agreement. He pledged to encourage fossil fuel production. On inauguration day, the White House website on climate change was taken down and replaced by a website promoting more domestic fossil fuel production. On inauguration day as well, the Sabin Center launched a new website called the "Climate Deregulation Tracker" to keep track of the efforts by the Trump administration to attempt to roll back regulations.

President Trump filled his cabinet with climate change deniers. Scott Pruitt, President Trump's first administrator of the Environmental Protection Agency ("EPA"), had made a career as the Attorney General of Oklahoma suing EPA to try to cut back on regulations. Mr. Pruitt has been replaced by Andrew Wheeler, who is a former coal industry lobbyist. The Secretary of the Interior was Ryan Zinke, a Congressman, who was also a climate denier. He has been replaced by David Bernhardt, who was an oil and gas industry lobbyist. Rick Perry, climate denier and former governor of Texas, was the Secretary of Energy. The nominee to replace Mr. Perry is Dan Brouillette, who is a former automobile industry lobbyist. The Secretary of State was Rex Tillerson, who was the Chairman and CEO of ExxonMobil. Mr. Tillerson has been replaced by Mike Pompeo, a former Congressman, who does not rank the environment high on his list of priorities. The Director of the Office of Management and Budget is Mick Mulvaney, a former Congressman and climate denier, who is also acting Chief of Staff in the White House. All of these people have "systematically set about to dismantle the system of climate laws and, more broadly, environmental laws." As of November 12, 2019, the Sabin Center's Climate Deregulation Tracker has 131 items on it.

Professor Gerrard noted that: "There has also been a systematic attack on the use of science." The Trump administration has abolished several of the scientific advisory boards, or has replaced the members with people solely from industry. On the first anniversary of President Trump's inauguration, the Sabin Center and the Climate Science Legal Defense Fund launched a website called the "Silencing Science Tracker." So far, there are 381 items on that list.

Professor Gerrard stated: "The United States is a litigious country, far more than any other country in the world quantitatively." During the Obama administration, the environmental protections that were put in place to fight climate change were challenged in court. During the Trump administration, the rollback of those environmental protections is being challenged in court by multiple lawsuits. Professor Gerrard further noted: "In the environmental arena, the Trump administration has a miserable record. They are doing very poorly in court." That is mostly because of procedural, not substantive, failings. In contradiction to the administrative requirements under the Administrative Procedure Act ("APA") and the National Environmental Policy Act ("NEPA"), "[t]he administration has been so arrogant that it has often abolished rules and policies and so forth without going through the necessary procedures and without providing a sufficient explanation."

There is no recognition in the United States to a federal level Constitutional right to a clean environment. There is now one federal case (the Juliana case) attempting to establish such a right, but it is uncertain how that will turn out. None of the major environmental statutes have been repealed—they are still on the books. According to Professor Gerrard, "There has been a tremendous amount of positive action at the sub-national level. Many states have adopted more vigorous environmental protections…Many cities are also working very vigorously to reduce their own greenhouse gas emissions and to adapt to the climate change that is coming."

The next Presidential election is a year from now and the outcome is uncertain. If there is a democratic majority in the Senate, one question is whether they will deploy the "nuclear option," which is eliminating the rule that 60 votes are necessary for the adoption of substantive laws. If that happens, then one could imagine strong climate change legislation being adopted after the election if there is a democratic president and a democratic majority in the Senate—but nobody is counting on that.

Professor Gerrard listed six central actors that have been pushing back against the Trump Administration's efforts:

i. civil society;
ii. the courts;
iii. the media;
iv. subnational governments;
v. the private sector; and
vi. the scientific community.

Daniel Wilkinson presented on findings of a report that Human Rights Watch released in September 2019 titled "Rainforest Mafias How Violence and Impunity Fuel Deforestation in Brazil's Amazon" (the "Report").

The Brazilian government responded to the Amazon forest fires by basically saying "fake news." The Environment Minister stated that the fires had nothing to do with deforestation, but were caused by dry weather. Human Rights Watch assembled satellite images of one of the regions studied for the report, the State of Pará, located in northern Brazil. Mr. Wilkinson stated: "You see that the fires are happening where the rainforest has been cleared. You do not have forest fires naturally in the rainforest."

With respect to the Report, the team in Brazil spent almost 1.5 years in Brazil and interviewed more than 170 people – about one half of the interviewees were in government agencies, and about half were community members. The Report has several main findings. The first is: "the deforestation and fires are being driven largely by criminal networks." The second major finding of the Report is that these criminal networks are using violence and intimidation against everyone who wants to try to stop them (forest defenders). The Report documents 28 killings.

Over the last 6 or 7 years, the indigenous people in the rainforest have organized what they call the "forest guardian patrols" to find where illegal logging is taking place. They are doing that because authorities are not doing their job, and are not able to do their job. Ten years ago, IBAMA had 1,600 field investigators for the entire country. Now, it has less than 800. In the State of Maranhão, IBAMA only has 8 field investigators. The National Indian Foundation (FUNAI), the federal agency that protects and promotes indigenous rights, in the State of Maranhão had 16 agents and 12 cars, of which only 2 cars were working.

Mr. Wilkinson stated: "What happens when people get killed? Usually nothing." In Maranhão, there have been 16 killings over the last five years and none of them have been resolved. Of the 28 cases documented in the Report, only one case has gone to trial. Moreover, death threats never get investigated.

According to Mr. Wilkinson, "These problems—the violence, the impunity—are nothing new. These existed before Bolsonaro…The big difference is that now, for the first time in Brazil, there is a government that is openly hostile to those people who want to enforce the law." This has effectively sent a green light to the criminal networks.

The consequences of the failure to protect the rainforest extend far beyond the rainforest and beyond the borders of Brazil. It is the largest tropical rainforest in the world and an important carbon sink. In 2009, Brazil committed to reducing deforestation to 4,000 sq. km per year by 2020, but deforestation has been increasing since 2012. (In contrast, from 2004-2012, Brazil reduced deforestation by 80%.) Brazil's commitment under the Paris Agreement was to eliminate all deforestation by 2030. Mr. Wilkinson noted that it is possible for Brazil to get back on track to meet its commitment.

Commentary

Judge Gabriel de Jesus Wedy stated: "It is important to highlight that there are major undesirable similarities between our countries at this moment. Two extreme, right-wing governments where agendas, [such] as environmental protection, human rights protection, social policies, investments in education and in health care are far from being a priority." Recently, Brazilian economist Arminio Fraga (former President of the Central Bank) reported the increase of inequality in the country and its damaging effects. The risk to democracy is not small.

Respecting the principle of separation of powers, the fundamental right to an "ecologically balanced environment" under Brazil's Constitution, freedom of press and speech are essential to the sustainable development of every nation. The Brazilian Constitution devotes an entire chapter of its text to environmental protection. Article 225 provides that: "All have the right to an ecologically balanced environment which is an asset of common use and essential to a healthy quality of life, and both the Government and the community shall have the duty to defend and preserve it of present and future generations."

Judge Wedy noted that there is an intention to weaken statutes that protect the environment. He stated: "It is not just about defending the environment, but also about defending the Constitution and the statutes. Our rule of law." He further stated: "The Brazilian government, society and economic groups should adhere to the fundamental Constitutional duty of guaranteeing a balanced environment and equally promoting sustainable development and its four modern pillars: environmental protection, economic development, good governance, and social inclusion." "Brazil must implement, among other things, the principles of environmental education, precaution, sustainable development, and polluter payer [pays], all of them provided for in our legal framework."

It is important to remember that corporations and individuals may be held liable for harm to the environment under administrative, civil, and criminal law. Citizens, NGOs, public attorneys, and prosecutors must bring environmental litigation so that judges apply environmental and climate law to repair the environment and to prevent environmental disasters from happening. Judge Wedy concluded: "In Brazil, we federal judges must carry out the duty of applying the federal Constitution, the environmental statutes, and our precedents for environmental protection in an intergenerational perspective."

Flavia Viana discussed "innovative actions that the Brazilian judiciary is adopting when it comes to social inclusion, economic development, and environmental sustainability." The National Council of Justice is a Constitutional body that carries out the strategic planning and administrative control of the judiciary nation-wide, encompassing 90 courts, with more than 18,000 judges, and a total workforce of 400,000 people. The 2030 Sustainable Development Goals ("SDG's") were institutionalized within the scope of the National Council of Justice and a Committee was created to cross-check of the Council's database with the SDGs. The results showed that every lawsuit in Brazil was related in at least one way to the SDGs. This national database is comprised of 1.6 Terabytes of data received monthly from the 90 courts related to 78 million pending cases. Judge Viana noted: "A better quality of information enables more accurate decision-making and strategic planning."

Brazil's national plan is to mainstream the SDGs in the judicial system and also stimulate the creation of innovation labs in regional and state courts. According to Judge Viana, "Awareness is key especially in times when the numbers of climate deniers are increasing in Brazil because of the political polarization." No other judiciary in the world has created SDG innovation labs, such as the ones in Brazil. Increasing awareness about the 2030 agenda in the judicial system and engaging people with the objective of solving governance issues relating to social, economic, and environmental sustainability will have a positive impact on Brazil within the next few years.

Mariana Pargendler summarized two themes that emerged in the conversation: (1) depression vs. hope; and (2) diagnosis of the problems in Brazil – misguided leadership and state capacity. Professor Pargendler noted that regional differences in state capacity are quite significant. Although there are concerning commonalities between Presidents Trump and Bolsonaro, there are also important differences. During the election of President Bolsonaro, Brazil was in a severe recession and had a severe crisis of corruption. Therefore, supporters of President Bolsonaro may have voted for him not because of, but in spite of, his social and environmental policies. In addition to international pressure, there is a lot of room for internal resistance to President Bolsonaro's policies.

Brazilian environmental laws in many respects are highly advanced. For example, Brazil has on the books unlimited shareholder liability for environmental harm. Professor Pargendler stated: "There is an important progressive sense of Brazilian politics that has historically materialized in progressive laws."

However, enforcement is a serious problem and there is great reason for concern. Professor Pargendler concluded: "There can be important grounds for both political resistance and resistance by the legal system since we do have an independent judiciary and a well-funded attorneys' office that is highly committed to enforcing the environmental laws that we have."

Maria Antonia Tigre discussed the regional perspective. The Amazon rainforest is a shared ecosystem. The Amazon Cooperation Treaty was signed in 1978 with the intent of the Amazon countries responding to the pressure of the international community to take steps towards

development and environmental protection in the Amazon. In September 2019, countries in the region came together to sign the Letícia Accord to protect the Amazon.

However, the issue of sovereignty still remains. Perhaps it is time to revisit the concept of sovereignty in light of the limitations of Principle 2 of the Rio Declaration. The sovereignty over natural resources is not absolute, but rather limited by the responsibility of States not to damage the environment (which is happening now with the fires in Amazonia).

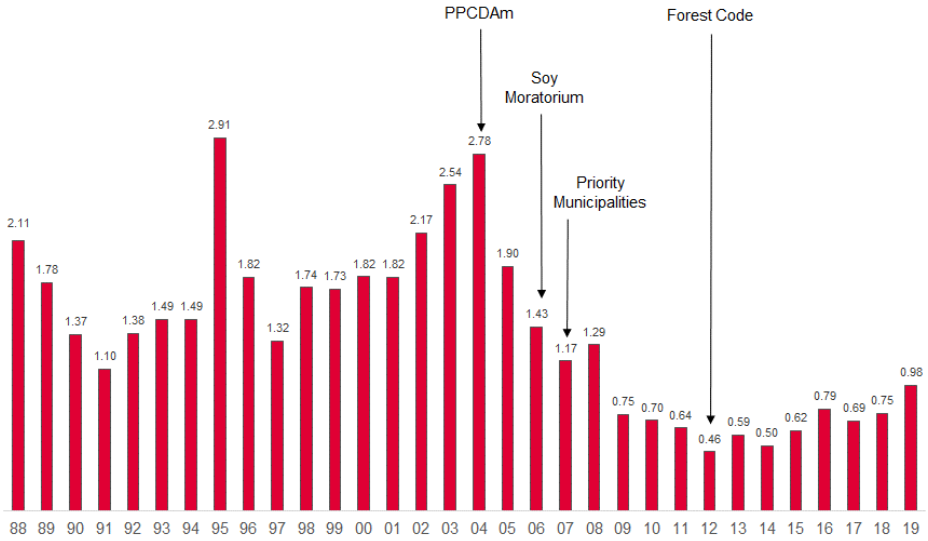
Following the first session in the morning on legal issues, attention in the second session turned to perspectives from the scientific community.

Breno Pietracci, an economist from the Environmental Defense Fund[1], was the first speaker and did a presentation titled "Economic Policies for Forest Protection".

He highlighted that since the onset of the PPCDAm (Action Plan for Deforestation Prevention and Control in the Legal Amazon) in 2004, Brazil has been able to significantly reduce deforestation in the Amazon biome as portayed in chart 1. The 2006 soy moratorium, the 2007 priority municipalities program, and the 2012 Forest Code revision, along with other policies, have also contributed to curb deforestation in the Amazon biome.

Chart 1

Historical Deforestation in the Legal Amazon from 1998 to 2019 (million hectares)



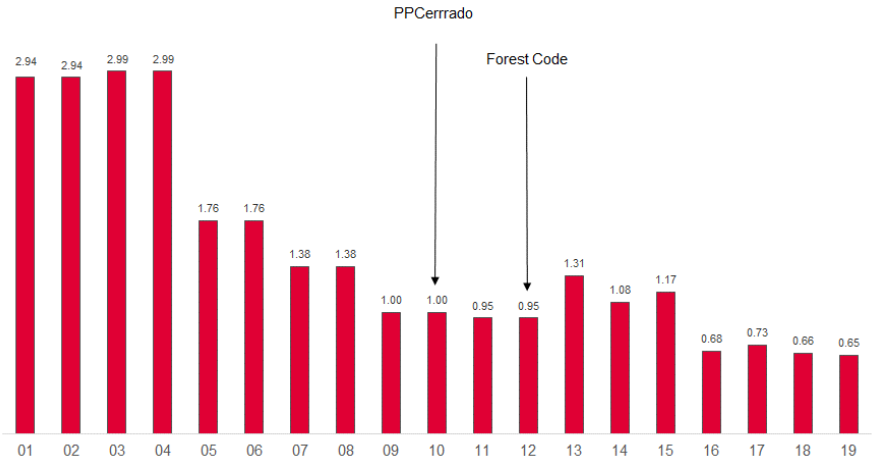
Source: INPE, National Space Research Institute - Terra Brasilis[2]

[1] https://www.edf.org/
[2] http://terrabrasilis.dpi.inpe.br/app/dashboard/deforestation/biomes/legal_amazon/rates

In the wake of the deforestation reduction results achieved in the Amazon, Brazil launched in 2010 the PPCerrado (Action Plan for the Prevention and Control of Deforestation in the Cerrado), aimed at protecting its tropical savanna. Chart 2 presents the deforestation time series for the Cerrado.

Chart 2

Historical Deforestation in the Cerrado from 2001 to 2019 (million hectares)



Source: INPE, National Space Research Institute - Terra Brasilis[3]

Although significant progress has been made in tackling deforestation with stronger law enforcement, more recently, deforestation has risen in the Amazon and plateaued in the Cerrado (but still far from historical highs).

Therefore, a particular concern of EDF has been to stress the need to couple stronger command-and-control policies with economic incentives to stop deforestation at a broader scale.

In fact, the Forest Code provides a good opportunity to roll out an economic incentive program. It legislates on rural land use in Brazil, determining the minimum percentage of native vegetation to be preserved within each rural private property, known as “legal reserves”, which amounts to 80% in the Amazon and 35% in the Cerrado. Native vegetation above these tresholds, known as “excess legal reserves”, can be potentially lawfully cleared for agriculture or cattle ranching.

[3] http://terrabrasilis.dpi.inpe.br/app/dashboard/deforestation/biomes/cerrado/increments

In practice, many landowners have "excess legal reserves". The existence of such excess reserves gives rise to the prospect of substantial potentially legal deforestation in the years to come.

In the state of Mato Grosso, for example, there are approximately 7.3 million hectares of excess legal reserves. EDF developed an econometric model that forecasts that, out of this total, around 1.4 million hectares are at risk of deforestation by 2030, potentially without violating the Forest Code and, as a result, cannot be addressed by law enforcement.

As a solution, IPAM (Institue for Amazon Research), WHRC (Woods Hole Research Center) and EDF proposed a novel financial incetive mechanism that can help limiting the extent of potentially legal deforestation in these vulnerable areas, by compensating farmers to forego their right to deforest their excess legal reserves. The econometric model indicates that the cost of compensating farmers for maintaining the forest intact on about one million hectares would be approximately $100 per hectare per year.

The benefits in terms of carbon emissions mitigation would be substantial. The analysis suggests that more than 450 million tons of potential CO_2 emissions could be avoided at a cost of less than $5 per ton.

Initial funding for such program could be made available by donor countries and/or the private sector. In the medium to long term, demand of carbon offsets from voluntary and compliance markets under the Paris Agreement are expected to provide the bulk of funding.

Ricardo Galvão addressed the group on the role of Brazil´s National Institute for Space Research (INPE) with respect to monitoring the degradation of the Amazon rainforest.

Dr. Galvão began with a broad examination of the strengths of INPE, and of Brazilian environmental science more generally. INPE has branches in literally every region of Brazil monitoring satellite data. While INPE has become quite well known abroad for its work in tracking rates of deforestation, the institute´s work goes well beyond earth observation. It includes, as well, space science, space technology, earth sciences, and meteorology and climate studies. Brazil´s physical equipment and its cadre of space scientists are among the most important in any country in the world south of the equator. Brazil has maintained close relations with China for more than thirty years in the area of peaceful use of space. A parallel program with NASA in the United States is laying the groundwork for better space weather prediction.

Turning to earth observation and measurement of deforestation more directly, Brazil has the capacity to build and develop its own satellites. Satellite monitoring is performed at the main

tracking and control facility at Cuiabá, in the Center West of the country, and at another one in Alcântara, in the North of Brazil.

Brazil also has globally recognized scientists working in this field. Professor Carlos Nobre of INPE, for example, received the Volvo Environment Prize 2016 as the "Guardian of the Amazon", distinguished by virtue of his pioneering efforts in the understanding and protection of the Amazon. Another INPE scientist, Dr. Antonio Divino Moura, has also received global recognition for his work in meteorology and climatology, including the Directorship of the International Research Institute for Climate and Society - Columbia University,from 1996 to 2002.

With that, Dr. Galvão turned to his main topic: how the rise of a broad nationalism movement in Brazil is leading to a broad denial of science at the highest levels of the Brazilian government and a rise of skepticism about global warming. In the particular case of Amazon deforestation, this denial is occurring despite abundant scientific evidence of destruction of the rainforest.

INPE observes and measures deforestation in Brazil using a system known as "PRODES", which uses images captured by LANDSAT class satellites. It has been in operation since 1988 and recent results, verified by independent specialists, indicate that it operates with a rate of accuracy close to 95%.

Our analysis of Amazon deforestation over very long periods of time in Brazil gives abundant reason for concern. We estimate that, over five centuries, 788,000 square kilometers of the Amazon rainforest have been deforested, corresponding to 19.7% of the of the original forest by when Brazil was discovered by the Portuguese. However, 436,000 square kilometers of this total have been deforested just since 1988, or about 10.9% of the forest in only the last three decades.

Authorities have concluded that most of the deforestation activity is conducted in order to grab land for illegal logging and mining. Most of the burning in the Amazon takes place during the dry season after clear-cutting has taken place during the rainy season.

Alarmed by this rise in deforestation, previous Brazilian governments stepped up enforcement activities using on-the-ground resources of IBAMA (Brazilian Institute of the Environment). At the direction of then Environmental Minister Marina da Silva, INPE in 2004 launched a new measurement tool known as DETER, an early warning system of alterations in the forest canopy in the Amazon region. This is the same system that the current Minister of the Environment, Ricardo Salles, claims that today is not working well.

Yet we can see very clearly in the earth observation data of INPE that deforestation in Brazil definitely decreased from exactly the time the DETER system with its early warning capability came into use. In 2004, 27,600 square kilometers of rainforest had been lost to clear-cutting. In the eight subsequent years, deforestation was reduced by approximately 80%, reaching 4,600 square kilometers in 2012. After that, it picked up again, reaching 7,500 square kilometers in 2018.

The DETER system allows us to see exactly how deforestation in the Amazon takes place in a "fishbone" pattern, with trees initially removed in a way partly intended to escape detection.

This leads to a loss of the forest understory and, eventually, to the total loss of the forest canopy. Even though the satellites cannot focus very well, accuracy has been improving and daily warnings can be issued.

The problem is that the Brazilian government under Minister Salles is choosing to ignore the warnings altogether, arguing that the science behind them is not sufficiently reliable. For example, the system issued 15 warnings per day in April-June 2019 calling attention to deforestation in progress in the Jamanxim National Park in the State of Pará. No enforcement actions were taken by IBAMA, which has been greatly weakened by the present government. Confronted with evidence of burning in the region, President Jair Bolsonaro speculated that the fires had been set by non-governmental organizations with foreign connections intent on embarrassing the government.

In addition to illegal logging, illegal mining areas have also expanded in the Amazon, particularly in areas set aside for indigenous peoples. INPE has been warning about the rise in this activity as well which threatens livelihoods of the Yanomani and other indigenous people and does great harm to the biodiversity of the Amazon, which is critical for the globe. For example, a new species of fungus was recently discovered in the Amazon, one that Yanomani women have been using to produce baskets and other woven products.

The standing forest brings many benefits to Brazil and the globe that the Bolsonaro government either does not recognize as legitimate science or simply ignores. The moisture brought from the Amazon is very important for agriculture in all parts of Brazil and in South America as our satellite data so clearly show. The carbon sequestration function of the Amazon forest has been reduced in each of the three decades since 1980, but the rainforest still absorbs more carbon than it produces via deforestation.

Our problem as scientists in Brazil is that climate denial is uniting the right and the left. In many interviews given around the world, Brazilian President Jair Bolsonaro has openly questioned data produced by INPE, calling the data “a lie.” Quoting from a news article published on July 18, Bolsonaro suggested to assembled journalists that Ricardo Galvão was “at the service of some non-governmental organization.” He went on to say: “With all the devastation you accuse us of doing and having done in the past, the Amazon would be extinguished already.”

One day later, in a widely publicized interview of his own, Dr. Galvão called out the President for his “cowardly attitude” and his “unacceptable attacks” on the integrity of the data and of him personally. This was one of his last interviews prior from being fired as Director of INPE.

Reflecting back on his own experience and that of INPE, the agency he directed until so recently, Dr. Galvão finished with an appeal to the global community to protect Brazilian science and Brazilian scientists. He starkly reminded the audience of the infamous reply of Adolf Hitler to Max Planck, when the later tried to petition Hitler to stop the dismissal of Jewish scientists: “Our national policies will not be revoked or modified, even for scientists. If the dismissal of Jewish

scientists means the annihilation of contemporary German science, then we shall do without science for a few years."

Concluding, Dr. Galvão stated that "the future of science in Brazil is at stake." To save Brazil´s rainforest, it is necessary to boost science and protect scientists in Brazil. He finished with an indirect reference to the smoke from the Amazon burning that filled the skies of São Paulo in August 2019. Bolsonaro, it turns out, through his actions has "helped to show the citizens of São Paulo the importance of the Amazon."

Douglas Daly of the New York Botanical Garden started his presentation by describing his experience in 2018 at an ecological station in Rondônia in the North of Brazil where he and his group of students were attacked by armed men. He discovered later that the armed men were looking for logging equipment that had been confiscated by IBAMA. The same men also attacked staff and facilities of IBAMA all the while keeping a strong connection with political leaders in the region.

Douglas has been doing field work and research on Amazon flora for the last 30 years. To do this research, one needs institutional partners, individual counterparts, students, and special visas and permits for the collection of biological specimens. Despite a rise in the level of concern recently, he and his team have been able, so far, to continue this work.

What concerns Douglas now are some actions of the Brazilian government that will slow down research on the long term, such as cuts in grants for research, a reduction in fellowships for students, and for new hires. The government has tightened the criteria for eligibility of institutions in the North of Brazil to be able to apply for funding.

Douglas called this accumulation of measures a process of 'capacity breaking' in contrast to 'capacity building'. This process is also being accompanied by the removal of key research partners from key positions in the government and in environmental agencies. Our work is being hindered by the loss of these people, he argues.

Brazilian science has been through ups and downs in the past. What is different now is the feeling of impunity on the part of government officials and the hostility toward and demonization of science. For the first time, Douglas is worried about being safe in Brazilian field stations.

Despite all of that, some positive developments deserve mention. First, more than ever, there is an intense collaboration and synergy among the different stakeholders related to environmental issues and in the Amazon. NGOs, universities, state agencies and community groups are help each other financially and logistically. This collaboration is something that is getting stronger. Second, civil servants in Brazil are sticking it out and weathering the storm. Brazil has tremendous depth in civil servants from environmental agencies who are dedicated and talented – a wonderful cadre of people who form a sort of "deep state". They have been doing a great job despite all the adversity.

Andrew Orta of the University of Illinois, and a Bolivianist, sought to place our discussion about the Amazon in a wider regional context. This involves imagining the Amazon beyond Brazil and seeing it as part of a more encompassing natural, biological, and conceptual system with connections to the high Andes, the Rio de la Plata basin, and other parts of South America.

Sustainability requires us to understand indigenous knowledge and practices - recognizing and learning from multiple ways of living in and with the Amazon. The larger point that there is no natural system that is pristine or undisturbed, but that there are different modes -- some more sustainable than others-- of human engagement with the Amazon. We must recognize that

locally adapted populations hold the possibility of as yet undiscovered resources that would be lost with the destruction of the Amazon. It is necessary to unpack the Amazon. It is not a unitary place. Contained within it are different sorts of forests, different connections with river systems, different kinds of engagement with human populations. There is a shared impact of the Amazon. The Amazon is not contained in any one country; it circulates within a broader region. Understanding these details seems important to effective communication and intervention.

Related to this is the challenge of making the Amazon more legible -- ecologically, sociologically, and legally. It is necessary to talk more directly about the hot spots of deforestation, violence, and also about who is involved. All of this fits in with the need to craft a more effective media strategy - how to package and convey information. How to avoid a focus on the spectacular moments of destruction (fires) and miss the more prosaic and arguably more impactful (everyday?) processes of deforestation.

This means expanding the conversation beyond lawyers and natural scientists to include social scientists, area specialists, as well as communications and information sciences folks to help develop more textured interdisciplinary information and ways of packaging and conveying it. Also, more Intentional collaboration needs to occur with Brazilians to think about the challenges of Amazonian policy and the frictions of working with international advocates from different national and professional perspectives.

In putting this idea forward, I am not dealing within the comparative US - Brazil angle of this workshop. But a conversation still to develop is what has worked or not worked historically for environmental advocacy in each nation. And what are the ways that Brazilian environmental movement could be allies and assets for climate change activists and policy makers in and focused on the US?

Thinking about the next phase of this workshop, Andrew presented a number of ideas.

If the white paper can be done or produced, this could be an opportunity for critical discussion and review.

We can think about phase two as a chance to follow up on some of the suggestions that point beyond the workshop, such as greater interdisciplinarity, the Amazon in broader context, etc.

We can think as well about developing a programmatic set of next steps and operationalizing those by having different institutions from the collaborating group steward additional work. We can envision what a broader international institutional network might look like.

João Paulo Braga focused his presentation on the role of the international community in funding the global carbon transition which revolves importantly around forestry, land use and agriculture in the Amazon region.

Brazil has been focusing on the importance of the Amazon in the international debate with less participation in broader issues of the global energy transition or infrastructure development to mitigate climate risks. As one example, the Green New Deal (GND) mentions forestry in the Amazon, but the largest amount of investment being proposed is for infrastructure projects. According to the estimates, governments should invest from 3-5% of GDP to tackle climate change. This amount, something on the order of US$3 trillion, is mostly driven by infrastructure projects in energy and transportations.

Global investments to avoid deforestation are around US$6 billion dollars annually. Tapping into these funds, and increasing this funding, is an issue that should concern us. The challenges are that when we look at projects related to energy and other infrastructure, the case for private sector involvement is more straightforward. Private sector investors are more readily involved because of the private economic returns in these projects. Meanwhile, projects to mitigate deforestation in the Amazon generate huge social returns, but few commercial opportunities for private gain.

What we observe is that private and public agents are trying to step into this funding void. Private investors are signing climate agreements, for example, while managers of financial assets in the US have increasingly applied ESG (Environment Social Governance) criteria to their portfolio selections. This movement toward investing with social returns incorporated is even more widespread in Europe. The potential is there for up to US$30 trillion in global assets under management to be allocated to projects incorporating ESG considerations.

The key question for Brazil, therefore, is how to take advantage of this new funding environment to access public and private resources on a far greater scale in order to protect the Amazon while contributing to the broader development of the Brazilian people. Many countries around the world already provide subsidies for green investments while multilateral funding organizations are seeking to diminish risks in those investments by issuing green bonds. Moreover, countries that issue green bonds observe a diversification in their investor base because they are appealing to investors who care about good environment practices. In that sense, protecting the Amazon is to show environmental responsibility.

So, what are the signals that Brazil is sending to the world right now? To what extent can these signals damage the country´s capacity to access funds? If we take a look on the recent Brazilian history of economic policy, we can identify an aggressive pursuit of a commodity-based

economy with obvious potential for damage to the environment. This is the wrong kind of signal to be sending.

For years, Brazil was a leader in environmental policies and its government was able to show that it could mitigate conflicts between economic development and environmental protection. One of the actions implemented was the creation of the Amazon Fund. With the support of Norway and Germany, Brazil was able to leverage more than $1 billion in REDD investments. The Fund has worked admirably well and with considerable transparency. It is ironic, therefore, that Brazil´s current Minister of the Environment has cast doubt on the future of the Fund and created a political crisis with its funders.

So, how should Brazil go about attracting new funds to protect the Amazon?

First, it is necessary for Brazil to make clear how much the funding gap really is for the protection of the Amazon region.

Second, discussion must revolve around the types of funds that are needed to fill this gap, along with new instruments, such as carbon taxation, capable of generating more funding.

Third, a concerted effort is required to bring on board the broader international financial system, including private investment funds.

Fourth, Brazil needs its own version of the Green New Deal, one that involves not just energyand other infrastructure, but forest protection as well.

Natalie Unterstell reinforced the idea that, during emergencies, it is important not only to react, but we need alos to find spaces to step back, to analyze the big picture and decide how to best intervene.

Jair Bolsonaro has been trying to undo the rule of law through capacity-breaking and changing the calibration of the policy levers. Bolsonaro has halted IBAMA's enforcement operations and cut budgets for law enforcement in the Amazon.

According to a Brazil policy tracker, since January 2019, Bolsonaro has attempted to weaken twenty environmental measures. On top of that, he passed ten new executive orders that allowed him to exclude participatory spaces that were available for civil society engagement in the design of environmental policies.

One of these spaces was the Amazon Fund Steering Committee. Dismantling this committee is one of the reasons why the Nordic countries are reluctant to support the Fund anymore.

There is in fact a new decree issued by the President expanding the area for sugar production in the rainforest. The soybean moratorium is also under attack.

The positive aspect of this movement is that, of the twenty attempts to change legislation, only one was successful. The failed attempts include the attempt to change the status of FUNAI

(Indigenous People´s Protection Agency). This movement was stopped through Congressional action.

The new role of the Brazilian Congress adds a new dynamic. The Congress used to be a space that no one wanted to go in order to discuss environmental issues. Now, even with the presence of the pro-agriculture block, the Congress is holding the line on key issues, e.g., allowing mining in indigenous areas which Congress will not approve.

There are also new coalitions being formed in the Congress by politicians who previously were not familiar with environmental issues. These, too, are creating a new middle ground to protect the legislation. President of the House of Deputies Rodrigo Maia deserves credit for erecting this legislative barrier in Congress.

Despite these reactions from the Congress and from civil society, the present stressful times could be just the beginning of the worst part of the story. There is much more to come and this is related to how the economic expectations are also changing around the environment in Brazil.

She concluded as follows: "We are all trying to do our best in terms of interventions, but we are also under attack. There is a deterioration of the civic space. I think that is where the US and Brazil, both academia and civil society, should try to come together. How can we mutually strengthen each other?"

Ruth S. DeFries reflected on the what now seems to be the 'Golden Age' - a time of earlier in the 2000s of strong scientific collaboration between the U.S and Brazilian governments. During that time, she worked with Professor Carlos Nobre and with INPE on the deforestation early warning monitor.

The concrete result of this collaborative endeavor is there to see - a dramatic reduction in deforestation which made Brazil a model for the world. Brazil showed that it is possible to reduce deforestation through new policies, monitoring, collaborations between municipal and national governments with civil society engagement. Most importantly, Brazil was able to reduce rates of deforestation while, at the same time, increasing its production of beef and soybeans.

So, the argument that environmental protection is not aligned with economic development lost its base of support.

What happened in Brazil during that golden age needs to be told and remembered. The protection of the forest does not need to be at odds with economic development.

Discussion Period Following Both Morning Sessions:

David Cassuto was invited to give his thoughts regarding ways of moving forward with the initiative represented by this Workshop. He reminded the group that much effective work is being done by people around the world although it is easy to lose sight of this at a time of global environmental catastrophe.

In order to address the problem what we need is focus; we need to create an interdisciplinary and international unit because all of the topics that were discussed in this Workshop are part of a larger collective problem. We cannot solve a collective action problem without joint effort.

The present gathering at Columbia is a great first step, bringing scholars and specialists from different fields together. The challenges faced by the United States and Brazil are similar, but they vary on a micro level. We need to work from the micro to the macro. If we can expand the scope of gathering like this one, we can form an intellectual and international collective that can speak with the power of many voices saying the same thing.

Ricardo Galvão commented on global pressures on Brazil to change its environmental policies. The international community needs to think about two words: "sovereignty" and "responsibility". In his view, the responsibility of taking care of the Amazon needs to be shared internationally. It need not impinge upon the issue of Brazil´s sovereignty.

To preserve the forest, it is essential to have models of economic development based on the biodiversity of the Amazon. In that sense, many countries can work together with Brazil. Some examples can be found, for example, in the supply chain for açai. Another example is that of

"Agropalma" and its business model for the sustainable production of palm oil in the State of Pará.

Other countries can help by developing new business models for sustainable exploitation of the forest and by reducing taxes on products of the Amazon that come from preserved areas. Brazilian producers are in need of financial incentives. He concluded: "To preserve the Amazon it is not only a matter of enforcement or even to call attention to its carbon sink function. The discussion needs to be broadened to include economic solutions based on biodiversity, so the people who live in the Amazon can have the prospect of social development."

Mariana Pargendler commented on the corporate law point about whether, for example, the U.S. can tell companies such as Exxon working abroad what they should do. Corporate law around the world is considered a case of private law. A great problem is that a corporation serves as a nexus for regulation. That can create an accountability gap.

Ricardo Galvão does not believe it is possible to preserve the tropical forest with a "blind capitalism" model. An international organization is needed to arbitrate and reduce inherent conflicts. We need to understand better how to proceed.

Natalie Unterstell commented on the potential for investment and divestment. She believes that creating new business models are not enough. We need to combat illegal loggers as well. Legal reform must be on the table as well. Does Brazil really have legislation that is strong enough to counter illegal logging? For example, land-grabbing has not been classified as a crime in Brazil.

Finally, a lot has been said about subnational governments in Brazil. Many are trying to mirror what is going on in the U.S. in such states as New York and California to counteract the Trump agenda. In Brazil, municipal and state governments are not really doing their part. She doesn't believe that mirroring the U.S is the way forward. "We do not have a California yet".

Douglas Daly commented on the tipping point of the Amazon. Nobody knows what the tipping point is, but everybody agrees that there is a minimum forest cover below which it will not be possible to assure the integrity of the Amazon. Another question is what kind of forest will the Amazon be? One model for Brazil to consider might be the U.S. model of responsible use of forest resources by private corporations that are carefully overseen. Can this approach of resource extraction with forest preservation by timber companies be implemented in Brazil?

David Cassuto argued that it is best not to rely only on people's better nature for protection of the rainforest. "The idea that we can just help people understand how horrible things are and then everybody will want to make it good, is at least pretty futile, in my experience". We need to be pragmatic; it all comes down to risk management: Rather than convincing people that we need to do good, we should all work to reduce the enormity of the risk that we will all face if we do not take action.

Ruth S. DeFries remembered the fact that the soy moratorium was successful because of the pressure that was coming from the European market. That kind of international pressure is not likely to happen again in a reasonable timeframe, we need to think about where are the right leverage points to create that kind of pressure now?

Concluding Comments from Workshop Organizers

Thomas Trebat spoke on behalf of the organizers of the Workshop from Columbia and Pace Universities. This Workshop met expectations by bringing together for lively discussion from Brazil and from the United States scholars, social scientists, and representatives of civil society to focus on the deterioration of environmental policies and standards in Brazil. A sense of common purpose emerged as participants all sought to share knowledge and to spread the word about the crisis in Brazil. It is especially appropriate to do so at this time in view of the serious risks threatening Brazilian science and those scientists in Brazil who dare speak truth to power in matters of the environment and climate change.

A consensus emerged around the table that the group of participants gathered around the table should try to stay together and to expand their dialogue. In particular, the group should seek to engage with more of the many civil society organizations in Brazil struggling to spread awareness in a threatening political environment. The most important contribution that foreign (non-Brazilian) universities can make is to offer "safe spaces" where scholars and civil society representatives from Brazil can meet freely in the United States without fear of retribution. This is an especially important contribution when one considers that each of the Bolsonaro and like-minded Trump administrations could remain entrenched in office for years to come.

Two concrete suggestions emerged as ways to preserve the energy unleashed by the November Worskhop meeting.

The first is to circulate this present Workshop Report. In addition to serving as a written record of what was discussed at the meeting, the Report could also give rise to shorter documents in the form of press releases (or Op-ed pieces and the like) to be disseminated widely by communications offices at each of the participant universities. In addition, summaries of the

Report, and perhaps even the entire Report once revised, could be broadly distributed via social media channels to our networks around the world.

The second outcome is a determination to keep this group together through the convening of a second Workshop or conference in Spring 2020. This conference could expand upon the nucleus of participating organizations present at the Columbia meeting in November, thus broadening our network. Professor Andrew Orta of the University of Illinois generously agreed to host a second meeting of the group at his university, tentatively set for mid-April 2020. At that meeting, participants will update the facts on the ground in both the U.S. and Brazil and consider further actions to spread the word globally and protect scientists and scholars in Brazil who dare to speak out.

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