

THE ROAD TO SUCCESS

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ABSTRACT

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By investigating the role of highways in the Brazilian Amazon rainforest, I emphasize the need to reassess the conventional approach to development that separates economic and environmental concerns. Arguing that the logic of purity, which treats these domains as mutually exclusive, should be replaced with an understanding of the world as already in ruination.

Drawing upon Anna Tsing's ideas, the study proposes a form of salvage development that recognizes the interconnection of economic and environmental aspects, while acknowledging the inherent ruination driven by markets and/or states. The paper raises several questions concerning the costs and benefits of these contrasting approaches and explores the possibility of reconciling them through salvage development. This alternative paradigm is rooted in diversity, contamination, and ruination. Thus concluding that, sustainable road infrastructure in the Brazilian Amazon is essential for fostering social and economic growth while minimizing environmental harm by reframing the purpose and implementation of highways that adopt environmentally sustainable practices and embrace a salvage development approach which lives in the present.

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Introduction

The Amazon region of Brazil remains underdeveloped in many aspects compared to the southern region, with the rainforest constituting a significant environmental variable. Consequently, highway development has become a contentious issue. In the Amazon, highway development is almost synonymous with deforestation, as it expands the "arcs of deforestation" resulting from illegal roads branching off legal ones. However, roads are one of the oldest forms of infrastructure and often serve as a barometer for a nation's health. They play a critical role in promoting social connectivity, facilitating trade, commerce, and tourism, providing access to markets, and fostering cultural growth. Inadequate highway infrastructure leaves rural and isolated communities cut off from the rest of the country, hindering their access to essential goods and services, limiting their economic potential, and perpetuating poverty. Thus, highways and roads are fundamental to the Amazon region's development, as they provide the infrastructure necessary for the movement of people, ideas, and goods.

This situation renders Amazonian development a paradox, given that the region constitutes a large portion of Brazilian territory and is resource-rich. It has the potential to become a major economic hub in Brazil, lifting the entire economy and millions of people out of poverty. However, road and highway infrastructure in the Brazilian Amazon is associated with illegal logging and "arcs of deforestation." This illegal deforestation harms the Brazilian economy by depriving it of valuable resources while simultaneously devastating its environment.

For this reason, the current Lula PT government has embarked on a full preservation campaign, in stark contrast to the previous Bolsonaro government's numerous proposals to refurbish and construct new highways in the Amazon. Unsurprisingly, the Bolsonaro and Lula governments hold opposing ideological views on Amazonian highways, but both seem to result in the region's underdevelopment.

The populations residing in these areas are most disadvantaged by the lack of highway infrastructure. Like the rest of Brazil, rural Amazonian populations should be guaranteed access to water supplies, garbage collection, broadband internet, and waste treatment. To either destroy or preserve the Amazon in its current state are not viable developmental strategies but rather ideological battlegrounds.

The implementation and purpose of highways determine their effects on deforestation, preservation, and economic development (Munnell, 1992). It is crucial to distinguish between legal and illegal roads, as well as between well-maintained and poorly-maintained roads. Moreover, extractive roads designed solely for facilitating the extraction of natural resources are more likely to lead to increased deforestation, while connective roads aimed at linking communities, creating urban centers, and promoting employment are more likely to contribute to regional development.

These highways and roads can be constructed with environmentally sustainable practices, minimizing their impact on the surrounding ecosystem. For instance, planners can employ non-invasive construction methods, incorporate eco-friendly materials, and create wildlife crossings and green corridors that enable animals to safely traverse roadways. By doing so, road infrastructure can be developed in a manner that promotes economic growth while minimizing

environmental harm. Nevertheless, harm will occur. Balancing the potential benefits and costs of infrastructure, green or otherwise, is essential when considering the environment versus the economy.

The purpose of this thesis is to explore the misunderstood role of highways in the context of the Brazilian Amazon rainforest. It addresses several questions: What were the costs and benefits of proposed highways during the Bolsonaro government? What are the costs and benefits (contradictions) of zero-deforestation goals in the current Lula PT government? How can highways be a form of developmental ruination? and Can we salvage value from dichotomous ideologies? To answer these questions, the paper first introduces two developmental theories in order to understand the ideological motivations of different regimes. Second, it analyzes Amazonian highway project proposals initiated during the Bolsonaro era.. Third, it examines the Lula PT government, analyzing the "zero deforestation" goals with a critical lens. Before moving onto the theoretical section of the paper which conceptualizes salvage development based on community, ruination, and impermanence.

The paper argues that Amazonian highways in Brazil are not inherently in conflict with environmental or sustainable development. Instead, they represent impure solutions that prerequisite development in the Amazon. The paper advocates for a holistic development paradigm rooted in diversity, contamination, and ruination. Specifically, it plays with the foregone conclusion that Amazonian highways are fundamentally unfeasible due to environmental, social, and economic costs. By examining and reconciling the diverse perspectives and interests involved in Amazonian development, it becomes possible to create a more inclusive, sustainable, and equitable future for the region and its inhabitants.

Part I

What is development?

Despite the reactionary duality of developmental theories, in this paper it is assumed that they all begin with the shared understanding that politics result from a Will-To-Live. In other words, the goal of politics, and by extension, development, is to live, to live well, and to enhance the quality of lives (Dussel, 85). This shared objective allows us to engage seemingly contrasting theories in a dialogue, identifying areas where they may complement each other despite the antagonism in their overall perspectives.

Additionally, Amazonian development should not be limited to the growth of already large cities like Belem and Manaus. The Amazon will become a developed region when the most disconnected rural populations are uplifted from their current impoverished conditions. Consequently, the development of the Amazon region as a whole is equivalent to the development of its rural communities. The progress of urban centers like Manaus and Belem is not fully indicative of the region's overall development. The primary focus of Brazilian development should be on improving the lives of the 6.9 million people residing in the rural areas of Brazil. Furthermore, it is the populations in these rural parts of the Amazon who are most directly impacted by the ineffectiveness of developmental debates that fail to place their needs at the center of the discussion.

Modernization Theory

Modernization theory posits that state development results from the adoption of modern industrial and technological practices. It contends that as states adopt these practices, they

experience economic growth, social development, and political stability. This theory originated in the 1950s and 1960s in the field of development studies, primarily developed by a group of social scientists and economists who aimed to explain the process of social and economic development in developing countries.

Walt Whitman Rostow, an American economist often considered the father of modernization theory, argued in his book "The Stages of Economic Growth: A Non-Communist Manifesto" (1960) that economic growth occurs in five stages and that developing countries could follow the same path to development as industrialized countries. Rostow believed that modernization could be achieved through the application of Western models of economic growth and political development.

Overall, modernization theory emphasizes the importance of economic growth, industrialization, and individualism. Its proponents believe that developing countries could achieve sustainable development by following the same path as Western countries, leading to improved living standards and greater political stability. However, the theory has been criticized for its Eurocentric assumptions and its failure to account for the diversity of social and economic systems in non-Western countries that might not be compatible with Western development narratives. It presents a linear path, which may not accurately reflect how Western countries developed, but instead represents a convenient developmental success story told in retrospect. The theory also assumes that the environment is merely a resource for development without considering that environmental exploitation can be counterproductive to development. It fails to recognize that it is possible to grow the economy through industrial practices without necessarily improving the quality of life.

Post-Development

Post-development theory emerged in the 1990s as a critique of modernization and neoliberalism. It contends that development, as a concept and practice, is inherently flawed because it perpetuates global inequalities, cultural imperialism, and environmental destruction. Post-development theorists advocate for alternative approaches to development that prioritize community empowerment, cultural diversity, and environmental sustainability. Arturo Escobar, a Colombian anthropologist, echoes this sentiment in his renowned book "Encountering Development: The Making and Unmaking of the Third World." He expresses the belief that development is a discourse that legitimizes the domination of the Global North over the Global South and perpetuates a system of colonialism and neo-imperialism.

This is a broad umbrella which positions itself in opposition, this paper is a product of many post-developmental discussions. The current conservation as development argument in Brazil would certainly be a version of post-development theory. But by borrowing from feminist, utilitarian, and anarchist theories the paper pushes the idea of ideological diversity to an extreme with the acceptance of value in the modernization paradigm.

Brazilian Political History

Within the contextual tapestry of the political history of the Brazilian states of Amazonas and Pará, the narrative thread of infrastructure development takes on a particularly significant role. This examination will traverse the temporal panorama of Brazilian politics, from the Colonial and Imperial Periods, through the First Brazilian Republic, the Vargas Era, the Military Dictatorship, up to the Redemocratization period, scrutinizing the interplay between the political

climate of each era and the genesis, financing, and implementation of infrastructure projects within the two states.

Colonial and Imperial Periods (1500-1889)

Within the nascent epochs of Colonial and Imperial rule, the Portuguese Crown, fueled by its voracious economic appetites, predominantly dictated the trajectory of infrastructure development in Amazonas and Pará. The primal transportation networks, primarily engineered to facilitate trade, sprung forth from the necessity of exploiting abundant natural resources like rubber, timber, and minerals.

The latter part of the 19th century in Amazonas was punctuated by a rubber boom, a period of exuberant economic activity that triggered significant infrastructure investment, notably the construction of the Port of Manaus and the Madeira-Mamoré Railway. Nonetheless, this infrastructural enrichment was largely confined to urban centers, leaving rural territories languishing in their disconnect.

Pará experienced a similar pattern of development, with infrastructure projects primarily orbiting around economic activities, with coffee and cacao plantations as the centrifugal forces. The construction of the Belém-Bragança Railway and the expansion of port facilities in Belém were among the key projects of the time. Alas, akin to Amazonas, the rural population remained largely neglected, as infrastructural developments were typically confined to areas of economic interest.

First Brazilian Republic (1889-1930)

The advent of the First Brazilian Republic heralded a shift in political power, as the reins transitioned from the central monarchy to regional elites. In Amazonas, the twilight of the rubber industry precipitated a retrenchment in infrastructure investment. Consequently, the state's political influence dwindled, and infrastructure development entered a period of stagnation.

Pará continued to ride the wave of economic prosperity brought by the coffee industry, which sustained the momentum of infrastructure development during this era. However, the regional oligarchies often orchestrated projects to serve their parochial interests, resulting in an inequitable distribution of resources and the continued marginalization of rural regions.

Vargas Era and Military Dictatorship (1930-1985)

As the political pendulum swung towards centralization during the Vargas Era and the subsequent Military Dictatorship, infrastructure development adopted a more hierarchical approach. The federal infrastructure projects in Amazonas and Pará, including highway construction, were primarily motivated by the objectives of national integration, economic expansion, and geopolitical aspirations.

Redemocratization (1985-Present)

With the dawn of redemocratization in Brazil, the pendulum swayed back towards regional autonomy and participatory decision-making, engendering a renewed emphasis on balancing economic development with environmental and social considerations.

In Amazonas, this shift manifested as an increased focus on the maintenance and enhancement of existing highways, such as the BR-319. Despite these efforts, the state grapples with significant challenges in expanding and maintaining its highway network, especially in remote areas.

In Pará, the state government has channeled investments into the improvement and expansion of its highway network to underpin economic development and regional integration. The government's initiatives range from modernizing and maintaining existing highways, such as the PA-150, to constructing new roads with an emphasis on environmental conservation and social inclusion.

In conclusion, the political history of Amazonas and Pará provides a rich context for understanding the evolution of infrastructure development within these states. It showcases the complex interplay between politics, economics, and socio-environmental considerations, and how these factors have shaped the trajectory of infrastructure development. As we look towards the future, the lessons from these historical experiences will be crucial in navigating the challenges and opportunities that lie ahead, in order to create a more sustainable, inclusive, and equitable model for infrastructure development in Amazonas, Pará, and indeed, for the broader Brazilian Amazon region.

The continuous narrative of this history reminds us that infrastructure is not just a product of economic forces or technological advancements, but it is also deeply intertwined with the political climate and social context of its time. This understanding, in turn, serves as a crucial foundation for any future studies that seek to delve deeper into the diverse and complex realities of infrastructure development within these unique regions of Brazil.

Voting Behavior

Since the return to democracy in 1985, Pará and Amazonas have seen significant changes in voting behaviors. The introduction of direct elections for state governors and presidents led to a diversification of political power and increased political participation.

In Pará, the state has often leaned towards left-leaning parties such as the Workers' Party (PT) and the Brazilian Socialist Party (PSB). This trend was particularly evident during the 2002 and 2006 elections when Lula da Silva of the PT won the state by significant margins. However, in more recent elections, the state has also shown support for right-wing candidates, reflecting a growing political polarization.

In Amazonas, the state has often been a stronghold for centrist and right-leaning parties. However, the state has also seen competitive races and shifts in political alignments. For instance, in the 2018 presidential election, the majority of the state's voters supported the right-wing candidate Jair Bolsonaro.

It's important to note that voting behaviors in Pará and Amazonas are influenced by a variety of factors, including economic conditions, social issues, and the influence of local political leaders. The Amazon region also faces unique challenges related to sustainable development and indigenous rights, which can have significant impacts on political dynamics and voting behaviors.

Moreover, voting behavior can vary significantly within each state, with different trends in urban areas such as Belém and Manaus compared to rural areas and smaller towns. Understanding these complexities is crucial for interpreting voting behaviors in Pará and Amazonas and the political dynamics in the Brazilian Amazon more broadly.

Luiz Inácio Lula da Silva (2003-2011 and 2023)

Jair Bolsonaro and Luiz Inácio Lula da Silva represent distinct political ideologies and approaches to governance in Brazil. Both leaders have had a significant impact on the country's highway infrastructure development during their presidencies, reflecting their differing priorities and visions for the nation.

Lula, a former union leader and founding member of the Workers' Party (PT), served as Brazil's president from 2003 to 2011. His administration prioritized social inclusion, regional development, and environmental conservation. His presidency is often credited with reducing poverty and inequality in the country and implementing several successful social programs, such as Bolsa Família.

Under Lula's administration, the federal government increased investments in infrastructure projects across Brazil, including those in the Amazon region. In Amazonas and Pará, his government focused on promoting sustainable development through the maintenance and improvement of existing highways, such as the BR-319 and PA-150.

Additionally, Lula's administration launched the Growth Acceleration Program (PAC), which aimed to boost infrastructure development across the country. This program included investments in transportation, energy, sanitation, and housing, and had a considerable impact on highway infrastructure in Brazil.

Lula's administration also emphasized the need for greater community involvement in decision-making processes related to highway projects, aiming to minimize negative impacts and ensure that infrastructure development benefits a broader range of stakeholders. Lula's most recent government (2023) has taken the conservation as development approach to another level with the 2030 zero deforestation goals which have in some ways limited the infrastructure

project options going forward. As before Lula has been known for his mixed approach to amazonian development his new government is much more focused on reducing deforestation and protecting jungle areas by slowing down infrastructure development.

Jair Bolsonaro (2019-2023)

Jair Bolsonaro, a former military officer and member of the conservative Social Liberal Party (PSL), became Brazil's president in 2019. His administration has been marked by a strong emphasis on economic growth and a more aggressive approach to infrastructure development, particularly in the Amazon region. However, his presidency has been criticized for its perceived lack of concern for environmental conservation and indigenous rights.

Under Bolsonaro's administration, the federal government has pushed for the expansion of highway networks in the Amazon region, including the completion and upgrading of existing highways such as the BR-319 and the construction of new roads. One example is the Ferrogrão railway project, which aims to build a new transportation corridor connecting the grain-producing regions of Brazil to the ports in the north.

Bolsonaro's approach has been criticized for prioritizing economic development at the expense of environmental conservation and the rights of indigenous communities. His administration has also been accused of weakening environmental regulations and enforcement, which could potentially lead to increased deforestation and environmental degradation as a result of highway construction and other infrastructure projects.

Moreover, Bolsonaro's administration has faced criticism for reducing the budget allocated to environmental agencies such as the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA) and the Chico Mendes Institute for Biodiversity

Conservation (ICMBio), which are responsible for the protection of the environment and the enforcement of environmental laws.

Lula and Bolsonaro represent different political ideologies and approaches to governance, which have significantly influenced the development of highway infrastructure in Brazil. Lula's presidency focused on social inclusion, regional development, and environmental conservation, while Bolsonaro's administration prioritized economic growth and infrastructure expansion, often at the expense of environmental and social concerns. The contrasting priorities of these two leaders highlight the complex relationship between politics, infrastructure development, and environmental conservation in the Amazon region and Brazil as a whole.

The political climate in each era had a significant impact on the development of infrastructure projects, including highway construction, in both Amazonas and Pará. The political history of Amazonas and Pará demonstrates that the political climate played a crucial role in shaping highway infrastructure projects, determining the distribution of resources, and addressing the needs of the local population. The shift towards more sustainable and inclusive infrastructure development in the Redemocratization period reflects the broader changes in Brazil's political landscape. However, significant challenges remain in terms of balancing economic growth with environmental conservation, ensuring equitable access to infrastructure services for all citizens, and maintaining and expanding highway networks in remote and environmentally sensitive areas. Addressing these challenges will require continued political commitment, as well as innovative approaches to infrastructure planning and implementation.

Analyzing Modernization: Bolsonaro and The Military

The military regime in Brazil during the 1970s was responsible for the original conception and construction of the BR-319, BR-163, and BR-230 highways, which currently connect the Amazon region. Without these highways, the Amazon region would be disconnected from itself and the rest of Brazil by car. However, the highway projects were left unfinished as the military regime waned in power and eventually collapsed in the early 1990s.

These projects were, and still are, motivated by modernization paradigms. They have created soy, lumber, and beef corridors, which enrich large business owners at the expense of rural populations. Their unfinished state has allowed for illegal activity to thrive in the Amazon, providing access but not connection. Many regular people avoid using many stretches of the highways due to the danger and poor road conditions, opting instead to use rivers to navigate the jungle. Despite these criticisms, they remain the only pathways for traveling around the Amazon region by car or truck.

Bolsonaro represents a type of modernization development that disregards the immediate needs of rural populations living in the Amazon region in favor of climbing the ladder of modernization, treating the loss of culture, knowledge, and lives as a small price to pay.

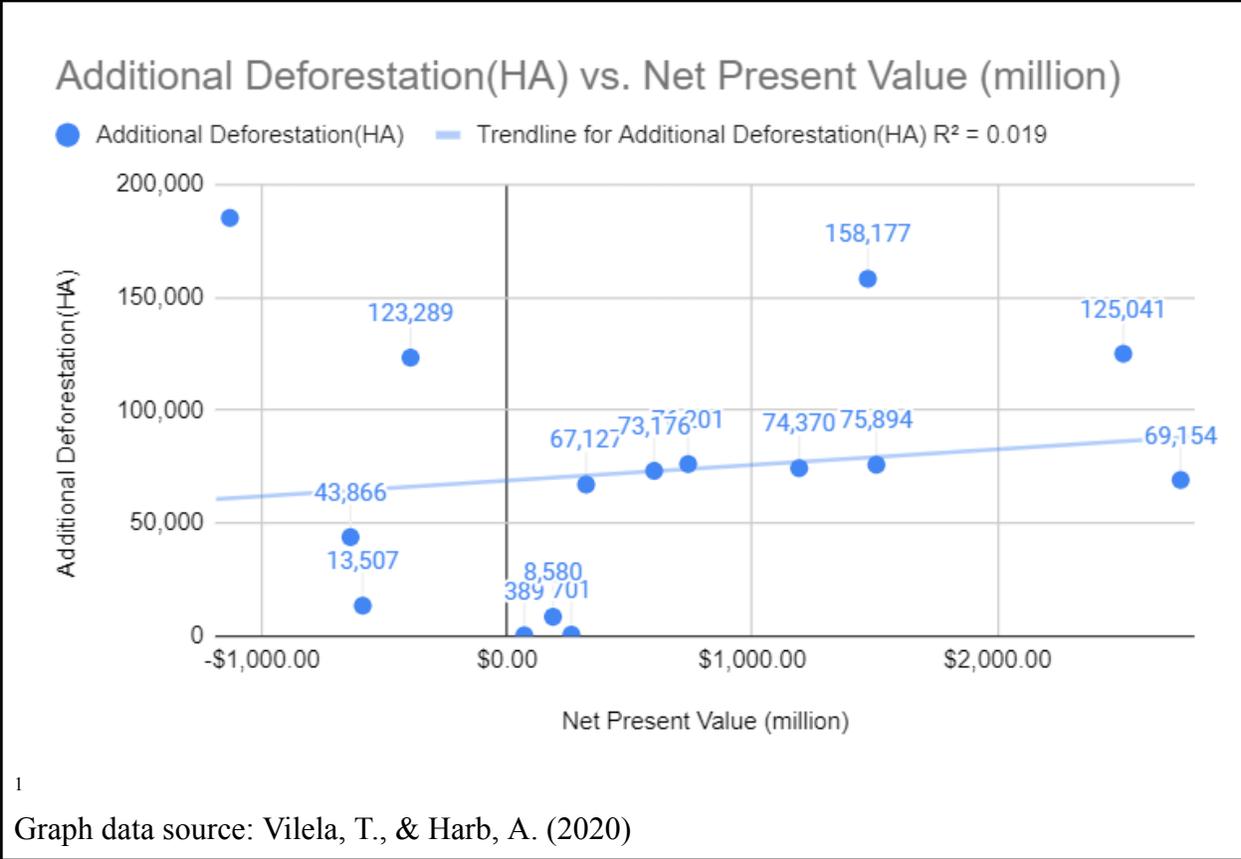
Not surprisingly, many are outspoken in opposition to the Bolsonaro era Brazilian highways. Some estimates suggest that the BR-319 highway could increase the deforested area to more than 1200% of the 2011 level by 2100 (Ferrante and Fearside, 2020) . However, despite these predictions and the need for additional research, the Bolsonaro government, in "bad faith," opened bidding for the paving of the highway on June 24th, 2020, without conducting any

environmental research. This demonstrates the Bolsonaro regime's fixation with Amazonian highway development at all costs.

Additionally, Fearnside (2006) provides insight into the BR-163 highway, which was originally built in 1973 and 1974. It has remained passable, although poor road conditions in the unpaved portion impede its use as a significant export route. Reconstructing the highway was one of the revitalization plans led by the Bolsonaro government. Nevertheless, the current situation is one of abject lawlessness, and further building of the highways could exacerbate illegal deforestation and settlement. Specifically, this Amazonian forest degradation results in forest fragmentation and edge formation, leading to the loss of biodiversity and water cycling, which contributes to the larger global warming crisis (Fearnside, 2005).

However, another perspective complicates the link between highway development and deforestation. Câmara et al. (2005) blur the lines between highway development and deforestation. Although deforestation is associated with highway construction, this correlation does not hold true for every municipality in the Amazon region. The presence of roads in the Amazon does not have a homogeneous effect across the region. Variables such as proximity to southern markets, climate restrictions, settlement sites, agrarian structures, and access to technology all determine the effects that highways have on the environment and economy.

To understand the trade-off between economic return and deforestation, this paper explores Bolsonaro-era highway proposals to determine what, if anything, is salvageable.



¹ Net present value (NPV) is the difference between the present value of cash inflows and the present value of cash outflows over a period of time. NPV is used in capital budgeting and investment planning to analyze the profitability of a projected investment or project. NPV accounts for the time value of money and can be used to compare the rates of return of different projects, or to compare a projected rate of return with the hurdle rate required to approve an investment (Fernando, Net present value (NPV), 2023).

The time value of money is represented in the NPV formula by the discount rate, which might be a hurdle rate for a project based on a company's cost of capital. No matter how the discount rate is determined, a negative NPV shows that the expected rate of return will fall short of it, meaning that the project will not create value (Fernando, Net present value (NPV), 2023).

A positive NPV indicates that the projected earnings generated by a project or investment—discounted for their present value—exceed the anticipated costs, also in today's dollars. It is assumed that an investment with a positive NPV will be profitable (Fernando, Net present value (NPV), 2023).

Utilizing an existing dataset which speaks to Bolsonaro era highway proposals, we honed in on highway proposals in the Brazilian states of Amazonas and Pará to create the graph above. These states were chosen because they contain the two largest Amazonian cities, the largest stretches of Brazilian Amazonian highways, and contain the majority of the Brazilian Amazon rainforest within their borders. Each dot represents one of the proposed BR-163, BR-230, and BR-319 highways. Deforestation is measured on the y-axis, while net present value (NPV) on the x-axis is used to determine the viability of each project as an economic investment.

As expected, every project entails deforestation, since building a highway through a jungle requires cutting down trees to create a path. The insight gained is that, although the dataset is relatively small, it provides an idea of the average deforestation that can be expected from highway projects in the states of Amazonas and Pará. Additionally the data shows that, in terms of NPV, the majority of these projects are economically viable investments (Any investment with an NPV above zero is expected to be economically viable).

This is not to say that all of them are unequivocal successes. For example, the project represented by the dot furthest to the left of the graph is absolutely nonsensical, with an NPV of negative one billion dollars and an expected deforestation of an immense amount of untouched jungle. Some of these projects were clearly not optimized to minimize environmental harm. The potential to reduce additional deforestation certainly exists if the projects were designed with sustainability in mind. Despite this, the estimated additional deforestation from the proposed highways would amount to 878,115 HA. When considering that deforestation in the Amazon is already in the ballpark of 86 million HA, this additional loss of forest would represent a 1%

increase. In terms of the entire Amazon rainforest within the Brazilian territory, consisting of 395 million HA of forest, the total additional deforestation would represent a 0.2% increase. These findings underscore two facts. First, the Amazon rainforest is vast, and compared to the deforestation already done, these proposed highway projects would amount to another drop in the bucket. They would not represent an extreme amount of additional deforestation when compared to the already deforested area or remaining rainforest. Second, the numbers are sobering, with the 86 million HA of already deforested jungle being larger than many countries, such as Portugal.

However, the impact of these highway projects on deforestation might have been overrepresented when taking the bigger picture into account, while the economic benefits may have been undervalued. On average, the total cost of these highway projects in the states of Amazonas and Pará would be \$490,979,841, with an average NPV of \$599,000,000. For every kilometer of highways built, we could expect a return of \$3,160,000 in NPV, and they would, on average, deforest an additional 213 HA for every kilometer of highway built or improved.

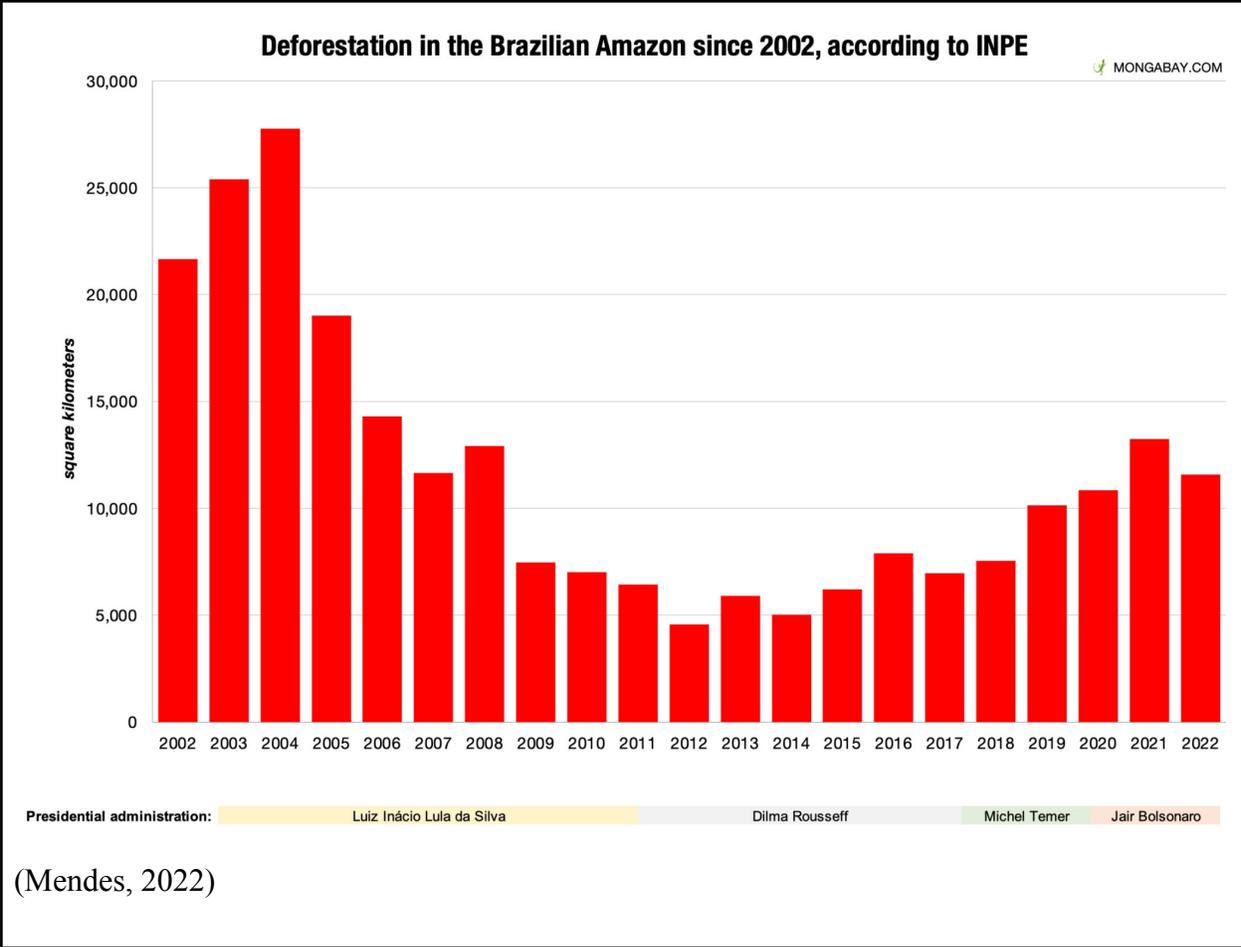
Proposed HWY Projects	Length KM	Investment USD/KM	Total Cost in USD	Net Present Value (millions)	Additional Deforestation(HA)	NPV/HA (millions)	NPV/KM (millions)	Additional Deforestation HA/KM
BR-163/PA	23	\$599,438	\$13,787,074	\$70.00	389	\$0.180	\$3.04	16.91
BR-163/PA	238	\$599,438	\$142,666,244	\$1,506.00	75,894	\$0.020	\$6.33	318.88
BR-163/PA	496	\$599,438	\$297,321,248	\$1,471.00	158,177	\$0.009	\$2.97	318.91
BR-230/AM	39	\$1,839,981	\$71,759,259	\$262.00	701	\$0.374	\$6.72	17.97
BR-230/AM	772	\$1,839,981	\$1,420,465,332	-\$1,131.00	185,147	-\$0.006	-\$1.47	239.83
BR-230/PA	32	\$1,839,981	\$58,879,392	\$187.00	8,580	\$0.022	\$5.84	268.13
BR-230/PA	269	\$1,839,981	\$494,954,889	-\$394.00	123,289	-\$0.003	-\$1.46	458.32
BR-230/PA	314	\$1,784,057	\$560,193,898	\$1,191.00	74,370	\$0.016	\$3.79	236.85
BR-230/PA	372	\$1,839,981	\$684,472,932	\$2,513.00	125,041	\$0.020	\$6.76	336.13
BR-230/PA	436	\$1,839,981	\$802,231,716	-\$639.00	43,866	-\$0.015	-\$1.47	100.61
BR-319/AM	329	\$1,839,981	\$605,353,749	\$2,247.00	69,154	\$0.040	\$8.35	210.19
BR-319/AM	402	\$1,839,981	\$739,672,362	-\$589.00	13,507	-\$0.044	-\$1.47	33.60
PA Average	272.5	\$1,367,787	\$381,813,424	\$738.13	76,201	\$0.031	\$3.22	256.84
AM Average	385.5	\$1,839,981	\$709,312,676	\$322.25	67,127	\$0.091	\$3.03	125.40
Average	310.166667	\$1,525,185	\$490,979,841	\$599.50	73,176	\$0.051	\$3.16	213.03

Data source: Vilela, T., & Harb, A. (2020)

These findings are despite Bolsonaro's complete disregard for the environment and human life. They are a result of the misunderstood value of highway infrastructure. Highways represent a tool that capitalism is salvaging and co-opting value from while disregarding their underlying motivation, which is connection and community. This paper argues that highways are such a potent developmental tool that even in the worst of circumstances, they still prove valuable to development.

Analyzing Conservation as Development: Lula and Amazonia 2030

Lula has been a strong advocate for the development of rural regions in the north, employing a mixed ideology that balances environmental interests with developmental goals. His government has been more successful than any other in lifting sections of the Brazilian population out of poverty and starvation. However, the current Lula administration is pursuing a zero-deforestation campaign in the Amazon. Consequently, Amazonian highways are not part of the current plans due to their association with deforestation. Yet, while the goal is to end deforestation in the Amazon, there is not yet a consensus on which intervention has been most effective in causing the region's dramatic reduction in deforestation.



And so conservation as a development strategy has been, at best, a moderately viable model for Amazonian development. The reality is that when deforestation rates decreased during the first two Lula administrations, this did not translate into development for rural communities living in the Amazon. In some ways, the quality of life actually worsened, with violence in particular increasing, due in part to a lack of employment opportunities.

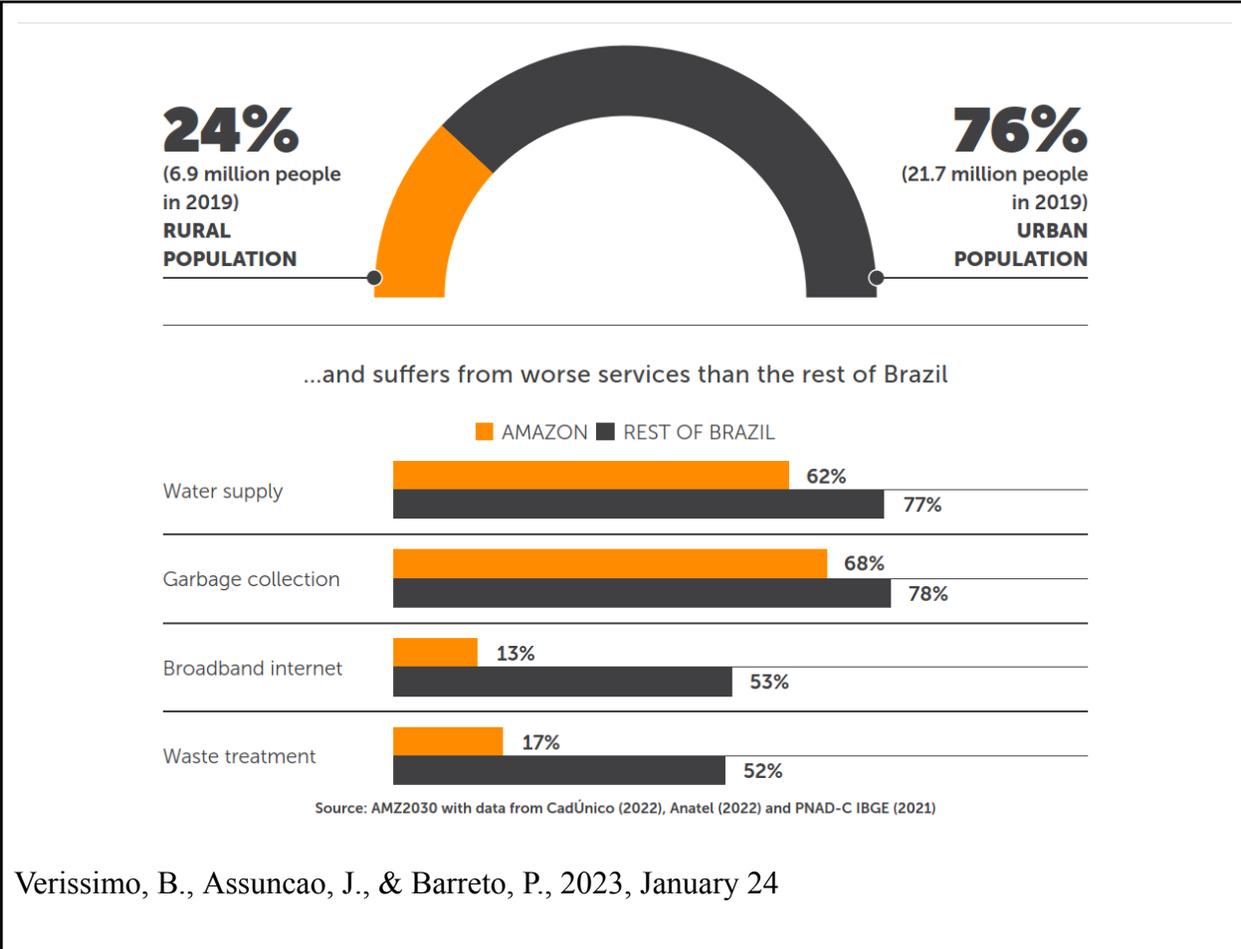
The lesser-known reality is that the Amazon's demographic makeup significantly contrasts with the rest of Brazil. By the mid-2030s, the area will undergo a demographic shift characterized by a larger percentage of economically active individuals (ages 18 to 64) compared to children and seniors (Soares, R., Pereira, L., & Pucci, R., 2022). However, due to the current

lack of job prospects, this advantage has turned into a liability. In fact, 40% of individuals aged 25 to 29 in the area are not part of the workforce (Soares, R., Pereira, L., & Pucci, R., 2022).

As job opportunities for young adults continue to be scarce, violence has consistently risen in the region since the early 2000s. In 2019, the homicide rate was already 70% higher than the rest of Brazil. When examining small municipalities in the region, those with fewer than 100,000 residents, the data reveals a notably high level of violence, resulting in 12,160 homicides between 1999 and 2019 (Soares, R., Pereira, L., & Pucci, R., 2022). This figure is nearly double the total death count in the Gaza-Israel conflict since 2008 and represents the number of lives that could have been saved if the homicide rates in the Amazon's small municipalities had mirrored those in other parts of Brazil over the past 20 years (Soares, R., Pereira, L., & Pucci, R., 2022).

This extraordinary degree of violence contributes to the worsening economic conditions. With limited opportunities, Amazon residents find themselves caught in a cycle of poverty, violence, and minimal economic growth. On the other hand, young people in the Amazon could become the catalyst for developing and sustainably utilizing the region's resources if given access to quality education, internet connectivity, advanced technologies, and job prospects.

In general, despite the conservation efforts led by the Lula administration, services in the Amazon have remained at lower levels than the rest of the country. This is in part because highway and road systems have not been included in conservation projects, and thus have been excluded from environmentally friendly development initiatives.



It is essential to reduce this distance and strengthen economic connections between the region and the rest of the world. These connections would boost the economy, generating jobs and income for the local population. Traditionally, investments in infrastructure and highways, in particular, are the safest bet for improving the accessibility of isolated regions (Verissimo, 2023). However, with the current misunderstandings, highways are seen as impractical.

Highways, conservation, and developmental goals

A robust and active state is crucial for overseeing areas with valuable natural resources, safeguarding public lands, and ensuring private property rights, thereby inhibiting illegal

activities and associated violence (Verissimo, B., Assuncao, J., & Barreto, P., 2023). In essence, strict environmental regulations, alongside a strong and proactive state, can effectively preserve resources and reduce illegal activities. However, stringent regulations paired with an absent state and limited capacity can provoke unlawful competition for natural resources, leading to the adverse consequences typically linked to illegality (Verissimo, B., Assuncao, J., & Barreto, P., 2023).

The Amazon region is best characterized by the latter scenario. Reducing this isolation and enhancing the economic connections between the Amazon and other regions worldwide are crucial for stimulating the area's economy and generating employment and income for local residents. Traditionally, investing in logistics infrastructure, particularly roads, has been the main approach for increasing the accessibility of remote areas.

But, promoting access to phone and high-speed internet services has been suggested as an alternative to traditional highway and road infrastructure development. This proposal posits that enhancing phone and internet connectivity can substantially improve accessibility while avoiding the socio-environmental risks that typically accompany the construction of conventional highways in the region.

The rationale behind this notion is that broadband infrastructure can potentially elevate income and job prospects for local employees and business owners. Given the region's fragile economy and increasing unemployment. Moreover, these improvements can be achieved without incurring the environmental expenses usually linked to investments in other forms of infrastructure, such as road and railway construction (Verissimo, B., Assuncao, J., & Barreto, P., 2023).

However, when critically examining this solution, it does not appear plausible. How can one build a broadband network in the middle of the jungle without first having access and physical connectivity to the remote areas they plan to cover with broadband internet? Thus, the solution to avoid building highways and roads itself would require highway/road infrastructure. Additionally, it is hard to believe that internet access is equivalent to having the ability to move around the region, even if it were possible to build internet infrastructure in the jungle without access to roadways.

The example of broadband internet as a solution to physical connectivity is symbolic of the contradiction of the Lula administration and the Amazonian 2030 zero-deforestation project. They are flexible and understanding of the complex nature of Amazonian development until it is necessary to discuss the practical implications of their recommendations (i.e., highways). The reality in the Amazon is that there is no development without deforestation. There is no pure plan that is without cost to the environment. It is in this dogmatic pursuit of perfection that they lose the practical aspect of development. The ideal and goal of zero-deforestation are as far-fetched and counterproductive as the idea of the invisible hand of the market.

Part II

Purity

Anna Tsing, the author of "The Mushroom at the End of the World," provides us with a framework that helps us move beyond absolutes. Her concepts of diversity, contamination, and ruination offer ways to reconcile our inability to achieve perfect theories and solutions. In this context, understanding the assemblages of life reveals a fluid balance between costs and benefits.

Highways in the Amazon serve as an example of how the ruination caused by initial deforestation becomes part of the solution for both the environment and the people living in it. Any solution that results in real development will be rooted in a contaminated and diverse compromise (i.e highways).

Modernization adheres to the purity of western market oriented development, while conservation as development adheres to the purity of the jungle and its cultures. Both approaches become means of avoiding engagement with one another. Without incorporating contaminated theories that inform our political actions, we inevitably face human underdevelopment.

Impermanent Salvage Development

The pursuit of a pure political-economic system is inherently paradoxical (end of history). Hypothesizing ways to dismantle parasitic structures while identifying those currently in use allows for a ruthless examination of the self-serving/ reactionary aspects of development theories by asking: How does each theoretical framework serve society, what problems are they solving, and what community needs are being met? Are they reproducing themselves as justification for perverted continuation? An impermanent epistemology is an exercise in identification through implementation and negotiation. The political community cannot be sequestered for indefinite periods by theoretical battlegrounds that ultimately strip away humanity, replacing the people with its own will to power. Organization for the sake of organization is insufficient. To attain an impermanent, salvaging development, it is necessary to

identify developmental value where it is ignored. This requires porous boundaries, concentrating on people-based action that transcends ideology.²

Permanent ideology/identity politics takes people and reframes them as conglomerates of their own interests. Nation-states and party lines are meant to be tools for the people, not complete and separate abstractions of them. Thus, in the same way and by extension, Amazonian highways become politicized and used as tools for ideology rather than for the people. Highways becoming abstractions with ideological connotations/intent.

But, unlike our current development theories, an impermanent political theory allows for a development that interacts with the patchy, interconnected reality before us. The concept of salvaging provides us with the language to describe what it means to live within our own ruination. When impermanence and salvaging are put together it becomes possible to theorize a type of impermanent salvage development.

In terms of highway development, we can learn from both modernization and post-development theories. Salvaging from both reveals that our own development does not readily adapt into a storybook theory or worldview, nor an event, and is part of a larger interconnected superstructure. Salvage development expands on the concept of Salvage Accumulation. It highlights the unidentified value in current development theories.

² Impermanence is the act that enables structures to rejoin the infinite before once again parsing out reality piece by piece.

Salvage development

"Salvage Accumulation" refers to the process of salvaging life encounters to make productivity possible (Tsing, 2017) . We must challenge ourselves to envision a world where progress is identified by overlooked value and encounters with the "other." Consequently, nature is not a romanticized space for anti-modernity; rather, it is modernity and vice versa.

Salvage development, then, is the process of salvaging encounters between developmental perspectives. Through this lens, we can investigate the value of highways that is overlooked by both conservationist and capitalist perspectives. Salvage development also enables us to come to terms with the loss of nature as part of human development—not as a resource, but as a partner sharing in the capitalist ruination that is our reality.

Romanticizing nature, whether through exploitation or conservation, enables its commodification in pursuit of the perceived modern. This alienation of nature is a self-imposition because only through alienation can humanity imagine itself as independent, "as if the entanglements of living did not matter" (Tsing, 2017). Thus, romanticizing conservation and strictly viewing conservation as development is also a form of alienation from the neoliberal capitalist system, which is ever-present. Once again, development is framed as a path to a world free of ruination. And so the conservation argument creates its own pure hierarchy of value that excludes the value present in capitalist ruination.

By failing to recognize this deeper, collective layer of human survival, we maintain a view that development is synonymous with either conquest and expansion or preservation and

degrowth. By employing a salvage development perspective, the study of development can begin to understand that survival requires livable collaborations, which necessitate working across time, space, species, and ideological commitments, thus requiring impermanence. Permanence and purity are not viable options, as contamination leads to diversity organized in units of collaborative encounters, these units not being self-contained (Tsing, 2017).³ If development theories disregard the power in an impermanent salvaging from each other, we bind ourselves to pure and permanent theories, ignoring the value of ruination as development.

Living in Ruination

Ruination and development are not inherently paradoxical by design or intent; rather, they reflect the duality present in all aspects of existence. Just as lightning requires a negative charge to attract a positive one, and rain necessitates a contrasting dryness, the powerful coexist with the powerless, and the right is defined by the presence of the wrong. Ruination and development are inextricably linked, with each concept reinforcing the other.

Attempting to disentangle these dualities is akin to expecting rain without moisture. Such a proposition exists solely in the realm of human imagination, lacking a basis in the tangible world of exchange, interaction, and material conditions. Regardless of our intellectual prowess, we must resist the temptation to seek salvation in intellectual purity.

³ They are organized units within a specific moment in time. These units maintain their form despite broader entanglements, allowing us to condense reality. Quantitative unit building is useful, but it lacks insight into why humanity perpetually alienates itself from a concept of ruination that allows for units in the first place.

And so we must grow into our own ruined capitalist industrial sites by in part accepting the value and opportunity that they provide us. Without acknowledging that the next phase of life arises from ruination, we confuse our human efforts to progress. Conservation can transform into domination (mistaken for progress) and can celebrate achievements that mirror its adversaries by concealing the value it salvages from them. To escape the repetitive cycle of progress, humanity must identify this cycle in all its forms. Only then can we recognize the paths to progress that do not confine us to the function of ideological exercise. Thus, it is precisely nature's practical persistence through ruination that allows for development and by recognizing itself within this ruination, humanity could learn to develop with life, without relying on dichotomous perspectives. In doing so, we would develop along with the rest of the universe, hurtling through space.

Necropolitics

The failure to recognize our continuous ruination renders us susceptible to the logic of necropolitics. Modern governments, acting as "benevolent states," determine which populations receive care and, consequently, which lives are prioritized. The choices of who gets to live are based on the axes of value and utility.

Those who are most valuable and useful to modern governments through death are given death, while those valuable and useful through life are given life. For those granted life, the aspect of death is erased. For instance, modern wars, despite being the deadliest of spontaneous human activities, are fought under the guise of preserving life rather than acknowledging the reality of war and killing. Narratives surrounding modern warfare emphasize freedom and safety

for citizens. However, the question remains: freedom and life for whom? Likewise, we can ask: development for whom?

Control in a modern state is maintained through an obedient population that is manipulated through narratives of life. Death becomes an unnecessary topic in obtaining power. Those relegated to the realm of death become peripheral to power relationships because modern power disregards death. It has already generated sufficient life for those chosen to live, making death the ultimate taboo. Death becomes a private matter, as it holds no pathways to power in a modern democracy. It is what modernity seeks to hide to display progress, despite a backdrop littered with continuous ruination.

Necropolitics links the subjection of life to the power of death. Necropower emphasizes the ability to make live and let die. "The ultimate expression of sovereignty resides in the power to dictate who may live and who must die" (Mbembe, 2019).⁴

Necropower calls attention to the facade of freedoms without unfreedoms. Similar to Einstein's $E=MC^2$, our political world cannot create development out of thin air. Recognizing that development is bound to a reciprocal system moves us away from a flawed interpretation of development as being possible without an equal and opposite reaction. Unlimited or utopian development is akin to turning coal into gold—seductive but objectively impossible. Those buying into the idea on any end of the political spectrum purchase fool's gold that distracts them from their intellectual poverty.

⁴ Dussel's will-to-live implicitly speaks to Mbembe's necropolitics. When we invert the idea of politics as a Will-To-Live it implies the idea that there also exists a version of politics that can function as the making of those which cannot live. Politics also then represents the Will-To-Die or functioning in allowing members to die, to die poorly, and decrease the quality of their lives.

Modern-day development theories, such as modernization and conservation as development, employ necropower and necropolitics in ways that destroy individuals and create death worlds where large groups of people are subjected to living in conditions that do not allow them a life, rendering them as living dead.

Necropolitics applies to both preservationist and economic frameworks where rural Amazonian communities are chosen by politics as those-who-must-die. In modern neoliberalism, they are made to die through the exploitation of their labor, environment, and culture. Excluded from the paradigm of western industrial patriarchal society, they become the populations that die so others may live. Conservation also leads to their demise due to a lack of services, employment, and economic stability. Poverty remains the status quo, regardless of whether the theoretical vision leans towards modernization or conservation, thereby marginalizing rural Amazonian communities through action and inaction.

While communities outside the Amazon continue to develop, and sometimes even manage to develop environmentally, in the Amazon, rural communities are made to die. They are sacrificed so that the rest of the world can continue emitting greenhouse gasses, deforesting their lands, and further developing their countries while imposing the unfair moralistic burden of maintaining the Amazon untouched for everyone else's benefit. The paradigm of necropolitics is so potent, and the worth of rural lives so low, that even attempts to uplift these communities still fail to prioritize their development.

It is intriguing how strongly the narrative persists that rural indigenous Amazonian communities are inherently more environmentally inclined than "others." This narrative is similar to the stereotype that African Americans have innate talent in music, dance, and art, or

that Asians are "good at math." This form of assigned identity based on race is a manifestation of tokenism and reflects how rural indigenous identities are used when advancing developmental arguments in the Amazon. They are portrayed as needing to be saved by the modern neoliberal market or preserved by post-development paradigms. Each side respectively employs indigenous identities as different from "Western" individuals as evidence for their arguments.

Such stereotyping and tokenism not only undermine the unique and complex experiences of these communities but also perpetuate simplistic and reductionist narratives that hinder meaningful progress. To move beyond these narratives and foster genuine development, it is crucial to embrace a more nuanced understanding of rural Amazonian communities and their specific needs.

Plato's cave

We remain in Plato's cave, gazing at our own shadows as if they were the outside world. We argue about whose interpretation of ourselves is most accurate, while the world continues beyond our limitations, irrespective of them. The systems of reality and life persist daily as we seek refuge in our physical and intellectual caves, debating within our confined understanding in the comfort provided by a universe that does not confine itself to any one setting.

As Nietzsche illustrates, there is no absolute right or wrong, for these concepts have evolved over time (Nietzsche, 2013). The human experience, our collective perspective of it, and the associated rules are malleable. Consequently, the pursuit of pure ideologies is an exercise in identity and represents wills to power. Thus, we cannot advance by elevating our ideologies to notions of right and wrong, disputing among ourselves as to who the true steward of progress is. There is no progress, progression, conservation, or destruction, except when processed and

encapsulated within the human experience as defined by societal norms of good and evil. When we abandon the struggle against one another and collaborate to improve each other's lives without ideological dogmatism, we can embrace society as it already exists and always will. We are and will always be mere cave dwellers arguing with each other. Only when we forsake escaping the cave do we stand a chance of living within it without bickering over the most virtuous way to do so.⁵

More broadly, we must consider problem paradoxes holistically, such as needing money to save the environment while making money in today's marketplace is often detrimental to the environment. Road development entails deforestation, but it also facilitates community action through enhanced mobility, allowing for greater representation and influence in addressing the consequences of illegal or corporate deforestation.

Paradoxes abound when we seek purity. For example, the world's largest polluters are also the most significant contributors to sustainable funds and projects. The US, the 10th largest per capita greenhouse gas emitter, is also one of the primary sources of funding for conservation efforts (World Bank, 2023). Similarly, Jeff Bezos and Amazon, which exemplify and perpetuate exploitative capitalist practices that dehumanize workers and deplete the planet's resources, are also leading philanthropists investing in sustainable practices worldwide through the Bezos Fund (\$10 billion) (Bezos Earth Fund, 2023). This is not a world of absolutes; we cannot find ultimate solutions to infinite problems with ideologies that react only to each other and our tumultuous history, rather than present day communities.

Only by salvaging the present can we discover solutions that are not enslaved to projected futures or constructed pasts. When we aim to save the world for future generations, we risk

⁵ This notion lies at the heart of anarchy – not the absence of order, but the recognition that order already exists without us.

offloading moral responsibility onto those who cannot yet speak for themselves, as if we can predict their wants and needs. This approach merely serves to justify our actions in the present by taking out a loan justified by the future desires of the unborn.

Part III

Implications in Brazil and Beyond

Salvage development can destigmatize and promote the use of highways as a component of environmental development. Although highways have often been associated with increased illegal deforestation in the Amazon, from a salvage development perspective, they can also play a crucial role in combating this issue. Illegal activities tend to be more prevalent at the fringes of the state, and highways and roadways create the opportunity for well-managed systems rooted in connectivity. By reducing the area outside any jurisdiction's control, highways can help combat illegal deforestation. Unconnected "brown areas" often invite the worst behaviors, while well-maintained highways and roads decrease the possibility of lax enforcement, ultimately serving as the first step in curbing illegal deforestation.

Highways and roads also contribute to overall development by enabling the free flow of people and resources within a territory. In the absence of such infrastructure, even basic functions become excessively costly. And without equitable highway infrastructure, exploitative industries thrive, as they are the only ones capable of conducting business in remote areas, and can easily monopolize vulnerable workforces due to the lack of alternative opportunities. Large mono-agriculture, drug cartels, and ranchers prosper in these isolated environments with low enforcement and limited external connectivity. They can acquire land at extremely low costs and

attract cheap, exploitative labor. Without proper highway and road infrastructure, new local businesses face insurmountable challenges due to the region's remoteness.

We must focus on salvaging current circumstances to reconcile the contradiction that highways are undoubtedly associated with illegal logging, land grabs, and degradation of indigenous cultures. However, highways also offer solutions to these issues, acting as multifaceted tools, similar to how a wall can both contain and repel.

This interaction is not exclusive to Brazil. Remote jungle regions in the Global South, like the Gabonese forests, face similar constraints due to the lack of highway infrastructure. Gabon, is home to the world's second-largest forested area after the Amazon and has only 20% of its roads covered in asphalt, making them the least developed in Africa (Free Documentary, 2020). The country's main cities, Libreville and Port-Gentil, are connected by river rather than road, leading to challenging driving conditions (Free Documentary, 2020). Gabon's harsh conditions make earning a living difficult, as the majority of the country remains undeveloped. And so, The nation's prosperity relies heavily on the logging industry, with drivers navigating immense vehicles across the country, transporting precious wood from the Forest of Bees logging locations to Gentil port.

Similar situations are found in Mozambique, where illegal logging at times represents the only employment option. When asked about their involvement in this line of work, one illegal logger simply responded, "I couldn't find any other work" (Best Democracy, Nov 2022, 00:25:10). And when asked what they would do if there were no more trees left to harvest the lumberjacks laughed and responded, "what do you mean no more trees, that's impossible, there will always be trees. There are loads over here and more over there, and after that we will find

another place with more” (Best Democracy, Nov 2022, 00:25:40). In such cases, local populations not only become complicit in illegal deforestation but also rely on it.

In the Congo, the lack of highway infrastructure hampers the daily life for those living within the jungle. Shabunda, a city in Congo's South Kivu, is among the most remote in the nation, with living expenses higher than any European city due to its inaccessibility. Consequently, impoverished families resort to using bicycles or motorbikes to search for food, often carrying up to 250 kilograms of goods for days on end, despite the inherent risks (Best Democracy, April 2022).

These examples highlight the non-developmental nature of conservation without accompanying economic stimulus and employment opportunities. While conservation may be a priority at national or international levels, individuals at the bottom must meet their basic needs, often resorting to illegal activities in remote areas to make ends meet. All these cases exemplify the importance of environmentally friendly development being supported by infrastructure, starting with road and highway connectivity.

Conservation efforts must be balanced with well-planned development initiatives that provide economic and employment opportunities. Infrastructure projects, such as highways and roads, can not only improve living conditions and accessibility but also help combat illegal deforestation and exploitation by increasing environmental enforcement over remote areas.

In conclusion, it is crucial to recognize the multifaceted role of highways and road infrastructure in both environmental conservation and economic development. By integrating well-managed highway systems into sustainable development strategies, we can address the underlying issues that contribute to illegal deforestation and exploitation while promoting economic growth and improving the lives of people in remote jungle regions around the world.

Conclusion

Both environmental deregulation and complete preservation are insufficient approaches to development. Regardless of the political ideology in power, the Amazon remains underdeveloped. The question is not which approach provides the answer, but rather how we can connect people to services, opportunities, and each other by salvaging aspects of modernization and post-development theories to serve development as defined by the ability to live well and improve the quality of lives.

The goal of economic development through deforestation is not beneficial for local communities, nor is preserving underdevelopment. To resolve this impasse, we must identify where each theory has underlying value and the source of that value. In this paper, I examine highways as an example of value that is misunderstood in the Brazilian Amazon development puzzle.

The overlooked value of proposed highways during the Bolsonaro government is not solely economic but also societal. Through analysis in this paper, we identify economic value in the majority of the proposed highway projects. This is contrary to some calculations that find Amazonian highways to be economically unsound investments (Teixeira, 2007). We also argue that if these proposals were developed with the environment and local communities in mind, they could serve as a catalyst for a physical connection in the Amazon that is sorely lacking and currently perpetuates a cycle of poverty. Concluding that Amazonian highways, although associated with deforestation and the far-right military regime in Brazil, can be salvaged to build an intriguing way forward. More generally we introduce an adversity to theoretical purity and

instead advocate for impermanent theoretical structures that allow for diverse contaminated theories to inform community based present day action/policy.

Examining the paralyzing nature of zero-deforestation goals reveals that even projects dedicated to sustainably focused development need to be continuously questioned and re-imagined in light of evolving conditions. Seeking the "right" solution or the environmentally friendly one does not preclude environmental destruction and being “wrong”. In many cases, it will require it as part of an assemblage of life that does not exist without ruination.

Ultimately, the paper concludes with the idea that Amazonian highways represent a necessary form of ruination in creating opportunity. Highways in the Amazon, when in service of rural communities, are essential if the goal is to continue on the inherently human path of a will-to-live.

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