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NATURAL CLIMATE SOLUTIONS & BIOLOGICAL CARBON OFFSETS

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INTRODUCTION

Avoided deforestation is one example of natural climate solution. It uses the forests natural processes to absorb carbon. Source: Rainforest Alliance

Carbon Offset Market *– a market where buyers purchase carbon offsets to decrease emissions.*

Carbon Accounting *– the action of tracking the flux of carbon.*

Climate change is arguably the most pressing issue of our time. As the race to net-zero continues worldwide, many skeptics believe that the clean energy transition will not be enough to fight climate change. Delayed action on this topic is forcing leaders to think of creative solutions to limit global warming by 1.5 degrees centigrade. **Natural climate solutions (NCS**) use the earth's natural systems of carbon uptake to remove excess carbon dioxide from the atmosphere. These solutions range from improving coastal wetland management, to protecting mangrove forests, avoiding deforestation, reforesting areas, and more ("The Nature Conservancy", 2023).

While the idea of natural climate solutions seems like a golden buzzer in the fight against climate change, its efficiency remains a highly debated topic among scientists. Controversial papers funded by conservation organizations have even estimated that natural climate solutions can account for "37% of the needed [emissions] mitigation by 2030," which we have seen now is not the case (Griscom, 2017). Conservation organizations like the Nature Conservancy have taken this stance on climate change and natural climate solutions to build donor support around conservation. The stance proves effective because it brings money from climate change donors to the conservation sphere, but are the natural climate solutions being created effective? Many natural climate solution projects participate in the **carbon offset market** to gain additional money, but who is conducting the **carbon accounting** in this market? Is the carbon accounting being done accurately?

The Senate Committee on Energy and Natural Resources must create legislation to address the validity of biological carbon offsets and natural climate solutions to ensure the carbon accounting done in the offset market is accurate.

EXPLANATION OF THE ISSUE

The Nature Conservancy is one of the world's largest international conservation agencies and a supporter of natural climate solutions. Source: The Nature Conservancy

Historical Development

Beginning in the 2010s, large conservation organizations shifted the focus of their operations, coupling conservation with the fight against climate change. These issues are interconnected but are also entirely different environmental topics on their own. The idea of natural climate solutions became popularized in 2017 after the publication of Bronson W. Griscom's paper. This paper was supported by The Nature Conservancy, one of the largest international conservation organizations. Griscom's paper sparked debate about the effectiveness and role these natural climate solutions play in the fight against climate change. Since 2017, this topic has gained attention in the scientific and political community to better understand natural climate solutions and its connection to carbon markets.

Carbon Markets

Kyoto Protocol- *One of the first global meetings about climate change.*

Carbon markets were popularized after the **Kyoto Protocol** in 1997, which was the first international agreement to begin reducing emissions. They were not fully endorsed by the US and China, but carbon markets continued to gain popularity after the Paris Climate Accord in 2015. Carbon markets can be broken down into compliance and voluntary markets. In compliance markets, there is central oversight and carbon credits and offsets are more regulated. Voluntary markets are less regulated but are gaining popularity as companies are trying to reduce their emissions ("Corporate Finance Institute", 2023).

Carbon markets are extremely beneficial for emissions trading. Emissions trading essentially means that when an entity decreases its emissions, it can trade a permit to a company that emits higher emissions to essentially cancel out emissions. Additionally, offsets can be bought when companies or countries invest in renewable energy projects or carbon capture technologies to reduce their carbon footprint. With the rise of natural climate solutions, biological offsets have entered carbon markets so that companies can invest in natural climate solution projects to offset their emissions.

Scope of the Problem

These biological offsets are extremely controversial due to difficulty documenting the exact amount of carbon trapped and stored (or **sequestered**) by each natural climate solution. How much carbon is sequestered by planting trees, versus conserving a mangrove forest? There are many factors to weigh when analyzing biological carbon offsets, but the key areas to focus on for policy solutions are permanence, additionality, leakage, and corruption. These issues are extremely important because they have the potential to create faulty biological offsets. Companies and countries are currently using these offsets to reduce their emissions and if these are faulty, the world will be behind in its emissions reduction. These issues must be addressed.

An example of no till agriculture. Source: "No-Till Farmer"

Permanence

Permanence refers to the timescale that carbon is sequestered for. Just because carbon dioxide is absorbed through nature does not mean it stays there forever. A carbon offset claims that a ton of carbon is sequestered, but for how long? Many natural climate solutions have varying timescales for how long they store carbon, but what timescale is acceptable in relation to carbon offsets? For instance, a company could buy offsets from a farmer who claims to use "no till" agriculture which essentially stores carbon in the soil because it is not released through tillage. This scenario works fine until five years later the land is sold and another farmer comes in and decides to till it—undoing the carbon storage that the sold offset counted for. As of now, policies addressing the timescales of biological carbon storage with offsets are minimal.

Corruption Graphic. Source: Global Governance Forum

Additionality

Additionality calls into question whether carbon offsets are capturing an additional ton of carbon. One type of natural climate solution that struggles with additionality is avoided deforestation. Avoided deforestation creates carbon offsets from existing forests and claims that their conservation creates additional sequestration. This might be the case if there was a plan to cut down the forest, but it got protected and is now creating that additional sequestration. However, claiming carbon offsets from existing forests that were never threatened calls into question the additionality of the offset. ("Can Planting Trees Save Us", 2020).

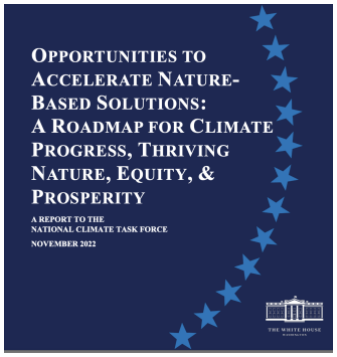
Leakage

Leakage refers to when a carbon offset is bought, but the carbon captured through the purchase of the offset is not equivalent. For instance, Disney could decide to plant 200 million trees and claim carbon offsets for it, but how can you ensure all of those trees will live and grow to capture carbon. Approximately 50% of trees that

are planted in reforestation projects die within five years (Banin, 2022). The offsets bought by Disney then do not represent the actual amount of carbon that will be sequestered. Leakage is the creation of faulty offsets due to disparities between the carbon supposedly sequestered in the offset versus the carbon that is actually sequestered.

Corruption

Corruption is an important part of carbon offsets because many of these offsets are generated abroad. That does not mean that the carbon offsets are all corrupt, but it means that there is a lack of enforcement which can create illegitimate carbon offsets. Even if regulations were created to monitor natural climate solutions and ensure legitimate offsets, corruption always poses a threat due to misaligned incentives. If offsets generated abroad are to be considered in the carbon market there needs to be trusted, organizational structures in place to reduce corruption.



Cover of the White House's roadmap for natural climate solutions. Source: White House

Congressional Action

Biological carbon offsets have been addressed in Congress recently. In 2021, the Growing Climate Solutions Act passed the Senate, but it has not been introduced to the House of Representatives yet ("Growing Climate Solutions", 2021). This bill authorizes the Department of Agriculture (USDA) to create a voluntary environmental credit market. This means that it gives the USDA oversight over what protocols and regulations to create in these credits and provides technical assistance to farmers to use sustainable land practices to reduce their greenhouse gas emissions.

Congress has not solved this issue, and this bill simply passes the baton of carbon offsets to another governing body. Congress must do more to create a clear approach to addressing biological carbon offsets.

Other Policy Action

Executive Order *– An order done by the President of the United States to get something done.*

On earth day in 2022, President Joe Biden issued Executive Order 14072 to recognize the importance of natural climate solutions in the fight against climate change. This **executive order** created a task force to identify key opportunities for greater development of nature-based climate solutions (Fact Sheet, 2022). It also created a roadmap for natural climate solutions (White House, 2022). This report is optimistic about nature-based solutions, but also recognizes the key hurdles nature-based solutions face.

IDEOLOGICAL VIEWPOINTS

Conservative View

Conservatives are split on whether climate change is a major political problem, but they largely agree that many policies proposed by liberals do too much economic harm to be viable. As for carbon offsets, conservatives have doubted the legitimacy of offsets in the past because they don't believe natural climate solutions actually offset emissions ("Republicans Upset", 2006).

Liberal View

Anthropogenic Climate Change *– The term referring to climate change created by human activities.*

Liberals almost entirely agree that **anthropogenic climate change** is a serious problem for the United States and the world, but depending on representatives' constituencies, members of Congress hold varying degrees of support for environmental regulation. Liberal environmentalists support the idea of natural climate solutions, but the whole-hearted support of their legitimacy is still divided due to issues of permanence, additionality, leakage, and corruption.

AREAS OF DEBATE

In this section, I will break down possible solutions to the complexities faced by natural climate solutions and biological carbon offsets. It is important to understand that these potential policy solutions are not the only answers. I urge you to understand these proposals and think creatively to come up with your own potential solution that your delegation would agree with.

Third Party Verifiers

Verra is the world's largest greenhouse gas verifier.

Third party verifiers of carbon offsets are commonly proposed and used among carbon markets. Third-party verifiers are usually NGOs, and they are used to ensure nature climate solution projects are accurately represented by the appropriate amount of carbon offsets. The issue with third-party verifiers is that they are only as good as the regulations imposed and required for them to report.

Third-party verifiers are essential to ensure accurate carbon offsets, but they must be regulated by another body. Third-party verifiers also have the potential to become a part of governments as a way to reduce bias and transparency. When thinking about third-party verifiers it is important to understand who the verifier is, who the verifier should be, and who the verifier is accountable to.

Many in favor of using and expanding third party verifiers have the goal of reducing the questions of permanence, additionality, and leakage by regulating carbon markets with the verifier.

Not many are opposed to third party verifiers, but they may be worried about who controls the third-party verifiers and if the third-party verifiers are actually accurate. Many faulty offsets are currently regulated by third-party verifiers, so it is not simply the creation of them but the quality of them that matters.

Political Perspectives on this Solution

Conservatives and liberals would both be in favor of third-party verifiers as it is a common policy used in regards to offsets. Some, however, may disagree on the level of oversight and regulation of this third part verifier necessary. Liberals may argue for a governmental verifier while conservatives may want a third-party nonprofit so that the government does not become too large.

Current third-party verifiers will argue for the status quo to continue with them as the verifier.

Mandatory Buffer Pools

The California Air Resources Board (CARB) currently operates a buffer pool for its forestry offsets.

Buffer pools are essentially an insurance policy used to reduce the effects of leakage with carbon offsets. One example could be with a reforestation project. The project wants to sell offsets, but with a buffer pool only 90% of the reforested land is eligible for carbon offsets. This would mean that the buffer pool is 10%, so 10% of the land is still reforested but not sold for offsets to account for any errors in carbon accounting (say part of the forest burns down but was sold for offsets). Buffer pools would be created by implementing a regulation on the carbon market for different buffer pool requirements for different natural climate solution projects.

People in favor of buffer pools advocate for them as a much-needed insurance policy against biological offsets. It is evident that the carbon accounting for nature climate solutions is behind due to lack of accurate knowledge of carbon sequestration and fluxes, but buffer pools allow for nature climate solutions to be a part of the fight against climate change with accuracy risk still considered.

Those against buffer pools might warn that they disincentivize the use of natural climate solutions because not all of the land is eligible for carbon offsets, which decreases the amount of revenue for project creators. A compromise with buffer pools could be made but must balance economic incentives and carbon accounting risks to appease both sides.

Political Perspectives on this Solution

Conservatives and liberals would both support the implementation of buffer pools for carbon offsets because they act as an insurance policy for the effectiveness of the offsets. They may

disagree over what exactly the buffer pool should be. Because conservatives have historically distrusted the validity of offsets they may argue for a larger buffer pool to overcompensate for faulty offsets.

Developers and landowners of natural climate solution projects would be affected by this because it would mean their natural climate solution would be worth less in offsets than it is now.

Expanded Research & Development

Research and Development *– this term is commonly referred to as R&D*

Expanded **research and development** helps generate accurate information about carbon fluxes for the varying natural climate solutions so that the offsets created are therefore accurate. Expanded research and development can happen through increased funding for these practices. To be most effective, expanded research and development should occur on the most used natural climate solutions. Research should be focused on how much land area for each type of natural climate solution can sequester one ton of carbon because offsets are based on this number.

Those in favor of this policy value innovation and the promise of natural climate solutions but want to solidify this knowledge and improve biological offsets. Additionally, those wary of biological offsets might want to channel more money into research to learn more about natural climate solutions.

Those against government spending and climate change might be deterred by this policy depending on how much money is spent on research and development.

Political Perspectives on this Solution

Conservatives and liberals who are wary about the validity of biological carbon offsets would both support this solution. Conservatives may be against increased spending on research and development compared to liberals.

Scientisits and universities are key stakeholders in this policy because the funding would allow them to dig deeper into the carbon sequestration potentials for different natural climate solutions.

Biological Offset Caps

Biological offset caps create a cap on the number of biological offsets companies or countries can buy to meet their emissions reduction targets. This policy looks to solve the issue of leakage among biological carbon offsets. If biological offsets prove to sequester less carbon then their offset is worth, companies using them would be essentially behind in their race to net-zero. Creating a cap would say, “Hey Disney, only 10% of your emissions reductions can come from biological offsets” which would mean that they have a diversified portfolio of ways they will reduce emissions. This would

mean that their emissions reduction does not solely rely on biological offsets, reducing the risk of faulty offsets. The cap is debatable, but it would regulate the carbon market for biological offsets.

The main benefit of this policy would be that it keeps the world on track with emissions reduction, while also using a new innovative way to do so—natural climate solutions.

Political Perspectives on this Solution

Conservatives may be against regulating the amount of biological offsets companies can use because it makes it harder for these companies to comply with net-zero standards. If conservatives agree that climate-targets are already too ambitious and companies are struggling to meet their targets, they might want companies to use biological offsets because it is the cheapest way to reduce emissions. Liberals who believe in natural climate solutions and want to reduce the negative impact of biological offsets would support this, but debate about what this cap is could be controversial.

Large corporations are key stakeholders here because they are regulated in how they are allowed to decrease their emissions to meet targets.

Image of carbon capture technology at scale. Source: Freeman

Eradication of Biological Offsets

Eradication of biological offsets fixes the problem of leakage and ensures that companies are only using offsets from renewable energy projects and carbon capture technologies. This policy could be implemented by simply banning them in the United States but would be most effective if coupled with research and development. The European Union has banned biological offsets in their carbon markets, but simply because they did not create effective policies to enforce the validity of their offsets. Banning might be a simple response to fear of uncertainty but natural climate solutions will inevitably be a part of the fight against climate change due to the White House's support of it, so eventually they will enter markets.

People in favor of the eradication of biological offsets are weary of their validity and do not have enough trust in regulatory agencies or the effectiveness of natural climate solutions.

Those against the eradication of biological offsets believe in natural climate solutions and feel they can be effective through enforced regulation and other policy measures.

Political Perspectives on this Solution

Conservatives who are skeptical of carbon offsets would be in support of their eradication. Some conservatives might be against the eradication of biological carbon offsets because of the natural resources in their state and the potential conservation benefits it brings. Liberals would favor reform of biological offsets more than the eradication of them completely.

Conservation organizations would be against the eradication of biological offsets because they are hoping to use nature-based climate solutions to further their conservation agendas. Companies working with direct air capture carbon technologies may be opposed to nature-based offsets because they directly compete with their technology.

BUDGETARY CONSIDERATIONS

When creating policy on carbon offsets it is important to consider who bears the cost of each policy. Regulation on carbon offsets may make them more accurate, but if too much of the costs are borne by people creating natural climate solutions, they may be disincentivized from creating them. The main costs associated with the potential policies listed come from the creation of third-party verifiers and research and development.

Additionally, costs may increase if the biological offset market is eradicated because it is currently valued at ~$2 billion dollars and set to rise to $250 billion by 2050 ("Carbon Offset Market Growth", 2022).

Image of the earth. Source: Wikipedia

CONCLUSION

The emergent discussion of natural climate solutions and biological carbon offsets presents promise in the fight against climate change but lacks the necessary regulation to be successful. Delegates must think critically about what legislation would be required to ensure reliable carbon offsets. Is the risk worth the reward? We must have confidence in the carbon offsets being sold on the market because companies use these offsets every day to offset their emissions in their strive to be net-zero. If these offsets are faulty, then companies will actually be emitting more than they say they are.

Delegates must balance what is best for the future of natural climate solutions and the market with the interests of their state as well. Even Republican candidates against climate change might find their state resource rich with many natural climate solutions. These resources create income opportunities for landowners in the biological carbon offset market.

With a complex problem like this, one isolated solution is not going to create an effective policy measure. Delegates need to combine policy issues and synthesize solutions to address all faults of the carbon offset market. Think outside the box to find an answer for the future of natural climate solutions and biological carbon offsets.

GUIDE TO FURTHER RESEARCH

The topic of natural climate solutions and carbon offsets is extremely complex and many of the facts are currently being debated worldwide. It is important to understand the four main complications with natural climate solutions and carbon offsets: permanence, additionality, leakage, and corruption. Understanding these themes will provide a lens through which you can learn more about different types of natural climate solutions. I would investigate whether any natural climate solution projects exist in your state as well as if there are any companies based in your state that are using biological offsets to decrease their emissions.

Additional research may be done to understand the current dialogue happening around biological carbon offsets. What are some ideas circulating regarding how to make them better? Which companies or countries are supporting them currently? Conduct research to formulate your own opinion, then think of how your delegation should act in response to this topic. I suggest watching this video to get a stronger basis of understanding about natural climate solutions; however, be wary of their optimism and bias. The Nature Conservancy and many other environmental organizations are overly optimistic and may exaggerate. They are not evil for doing so as natural climate solutions create the perfect scenario—a market based on conserving land and fighting climate change—but it is important to think critically about their effectiveness and policies to address this market.

GLOSSARY

Natural Climate Solutions (NCS) *– processes that use the earth's natural systems of carbon uptake to remove excess carbon dioxide from the atmosphere.*
Carbon Offset Market *– a market where buyers purchase carbon offsets to decrease emissions.*
Carbon Accounting *– the action of tracking the flux of carbon.*
Kyoto Protocol- *One of the first global meetings about climate change.*
Carbon Sequestration *– the process by which carbon dioxide in the earth's atmosphere is trapped and stored, thereby reducing its impact on global climate and warming*
Executive Order *– An order done by the President of the United States to get something done.*
Anthropogenic Climate Change *– The term referring to climate change created by human activities.*

Research and Development *– this term is commonly referred to as R&D*

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