CLIMATE-SMART AGRICULTURE

Indigenous Environmental Network
Climate Justice Program Series

INDIGENOUS ENVIRONMENTAL NETWORK

November 2022

The Indigenous Environmental Network Climate Justice Program Briefing Series is a result of IEN's Internship Program. This year, IEN is pleased to work with three masters students from the Environmental Policy and Sustainable Management (EPSM) program of The New School, based in Manhattan, New York City, NY: Elisa Soto-Danseco, Nam Pham and Joshua Witchger.

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November 2022

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KEY TAKEAWAYS

1	**Climate-Smart Agriculture (CSA) reinforces structural hierarchy and emboldens dominant forms of power, while attempting to erase Traditional Indigenous Knowledge.**	CSA is financed by powerful international financial institutions (IFIs) and profit-driven agribusiness aiming to profit from scaling up CSA. Indigenous Peoples' self-determination, sovereignty, land-use decisions, and traditional food systems are increasingly under threat as the interests of Big Ag dominate.
2	**CSA will use agriculture and soil offsets in carbon markets, which fail to keep fossil fuels in the ground.**	The CSA agenda is being established to provide offset credits to carbon markets. It allows polluters to claim they have reached their so-called "net-zero" emissions targets. Carbon markets do not keep fossil fuels in the ground and do not cut emissions at source. Offsets provide another way for polluters to pollute and agribusiness to profit, while negatively impacting the health of Indigenous Peoples and marginalized frontline communities. False solutions distract from the root causes of climate change and allow polluters to keep on polluting.
3	**The climate-smart agriculture agenda co-opts genuine regenerative practices and corrupts efforts to meaningfully address climate change. Climate-smart agriculture compromises long-term food sovereignty and Traditional Indigenous Knowledge based efforts by promoting an agenda of food security.**	By promoting a range of so-called "climate-smart" farming techniques, the deception of the CSA agenda equates profit-driven agribusiness technologies with regenerative practices including Traditional Indigenous Knowledge in the fight against climate change. The false emphasis on food security over sovereignty drives the CSA agenda to prioritize productivity and profits over Indigenous and locally-driven approaches for an autonomous food web.
4	**Climate-smart agriculture expands colonial frontiers and prioritizes "expert" knowledge. The exploitative power dynamics of colonialism are entrenched in climate-smart agriculture.**	The legacy of colonial power continues through financial and agricultural development institutions led by "experts" of Eurocentric science and technology. As climate change accelerates, the colonial pursuit of land for carbon accounting leads to land-grabbing, forced land-use changes, unsustainable agriculture practices and coercion of Indigenous Peoples' knowledge and territories.
5	**There is no excuse for the violence of industrial farming, land grabbing and large-scale destructive agricultural practices! Yes to Traditional Indigenous Knowledge, community-led and locally organized food sovereignty, Indigenous sovereignty, and Indigenous Jurisprudence.**	Climate-smart agriculture cannot possibly result in food sovereignty or securing Indigneous Peoples' sovereignty and jurisprudence, territorial rights, demarcation of ancestral lands, or true reparations for Indigenous Peoples and local communities because the violence of climate change far outweighs what can be measured in dollars. Climate-smart agriculture is not designed to deliver resources directly to impacted Indigenous Peoples or local communities.

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SETTING THE STAGE

Through Traditional Indigenous Knowledge (TIK), Indigenous Peoples continue to work in balance with Mother Earth to produce food and enhance biodiversity. As the impacts of climate change worsen, Indigenous Peoples and small farming communities are being targeted by the lure of Climate-Smart Agriculture (CSA). CSA casts a wide net, including land-use practices, limiting crop selection, and agricultural products that are presented as solutions to the food and climate crisis. Yet a deeper look reveals that CSA is merely the latest effort by agribusiness, financial institutions and governments to maximize profits and monopolize control over food systems and Mother Earth. Rather than supporting Indigenous Peoples and local communities to enhance existing food sovereignty from the bottom up, CSA imposes an agenda from the top down pushing a dominant, coercive narrative based on the false solutions of profit-driven multinational corporations. CSA jeopardizes the future of diverse food sources and seeds, targets Indigneous Peoples' forests and lands, limits Indigenous Peoples autonomy and sovereignty, and ultimately perpetuates industrial farming and fossil fuel dependence.

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On a global scale, CSA is fueled by the concern that food production will not be able to keep pace with a growing population experiencing the impacts of climate change unless "climate-smart" farming practices are widely adopted. With the development regime and the expansion of industrial agriculture at stake, the United Nations (UN) and the World Bank are pouring billions of dollars into actualizing the "climate-smart" agenda for its perceived ability to offer food security and climate mitigation alongside the UN's Sustainable Development Goals.[1] The World Bank's Africa Climate Business Plan is just one example, having spent $1.8 billion on 57 CSA projects in Africa in 2018.[2]

Led by international financial institutions (IFIs) in the Global North, corporate and state powers are pushing an economic development framework that has plagued nations with debt through colonialist, profit-driven projects and land-driven interest. CSA extends this colonial paradigm by promoting an array of farming practices that are primarily concerned with production, while ignoring crucial issues such as land and water access, Indigenous Peoples' rights and sovereignty, labor

1 The World Bank Group has committed $83 billion in climate-related investments from 2016-2020. The World Bank Group. 2021. Climate Change Action Plan 2021-2025: Supporting Green, Resilient, and Inclusive Development. 2021. https://openknowledge.worldbank.org/bitstream/handle/10986/35799/CCAP-2021-25.pdf?sequence=2&isAllowed=y

2 The World Bank Group. 2020. World Bank 2020: Next Generation Africa Climate Business Plan – Ramping Up Development Centered Climate Action. World Bank, Washington DC. http://knowledge-uclga.org/IMG/pdf/03_rprt-wbg-daff.pdf

rights, and access to inputs, as well as to how food is distributed and consumed.[3] In this light, CSA's rising influence and sustainability rhetoric gives the appearance that CSA is a silver bullet solution to hunger, poverty, climate change, and development.

Efforts to control Mother Earth and limit Traditional Indigenous Knowledge are as old as colonialism. However, since the Green Revolution in the 1960s, the marriage of technology and markets are a driving force in global industrial agriculture. The advent of laboratory-designed farming inputs, versatile markets for crop use, widespread pesticide use, monocultures and the increased consolidation of agribusinesses create profit for the few at the expense of the many.

CSA's embrace of agricultural markets and commodity frontiers is particularly concerning for food system democracy, especially for Indigenous Peoples and small farmer communities. In the last two decades, farm-based conservation projects and practices of environmental responsibility have propelled CSA into new directions as private enterprises, international institutions and federal incentives finance farmers to adopt CSA. This briefing aims to expose the dangers of CSA and the increased expansion into soil offsets, both of which threaten Indigenous Peoples, the future of land health, the climate and food sovereignty.

KORONIVIA JOINT WORK ON AGRICULTURE

The Koronivia Joint Work on Agriculture (KJWA) was established at COP23 with the goal of transforming food and agriculture systems to better combat the climate crisis. While this may sound like a noble goal, KJWA is rife with opportunities for CSA, soil offsets, and other misguided agricultural-based "solutions" to take center stage.

The KJWA is built on six areas of focus: soil, nutrient use, water, livestock, methods for assessing adaptation, and food security/socioeconomic dimensions. Together, these elements aim to boost climate adaptation and mitigation efforts, enhance productivity, and improve livelihoods and nutrition.[4] However, as the goals of the KJWA begin to actualize, key flags are worth noting in the lead up to COP27 in Sharm el-Sheikh.

3 Taylor; Marcus. 2018. Climate-smart agriculture: what is it good for? The Journal of Peasant Studies, 45 (1): 89-107. doi: 10.1080/03066150.2017.1312355

4 Drieux, E., A. Van Uffelen, F. Bottigliero, L. Kaugure, and M. Bernoux. 2021. Understanding the future of Koronivia Joint Work on Agriculture-Boosting Koronivia. FAO, Rome. https://www.fao.org/3/cb6810en/cb6810en.pdf

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At COP26 in 2021, conflict arose around the role of KJWA principles, particularly around whether or not agricultural-based climate change mitigation efforts (which can include soil and methane offsets) should be allowed in KJWA outcome reports. Several countries in the Global South argued that reporting climate mitigation undermines KJWA's key tenet of achieving food security.[5] Additionally, reporting climate mitigation efforts could allow for soil and methane offsets to be counted as legitimate ways for countries (particularly those in the Global North) to "achieve" climate goals, including their Nationally Determined Contributions under Article 6.2 of the Paris Agreement. The understanding that mitigation (through CSA, offsets, or other means) is beneficial is misguided, as offsets do not ensure long-term emissions reductions and allow polluting industries to continue polluting. The allowance of mitigation reporting in the KJWA could prove further damaging by expanding international emissions trading schemes either by countries or projects, under Article 6.2 and 6.4 of the Paris Agreement.

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A further conflict of KJWA centers on whether or not "reducing total livestock numbers" should be included in the agreements under the livestock category. Moosmann, et. al. (2022) note that while reducing meat consumption and livestock emissions is essential to meeting the goals of the Paris Agreement, this initiative threatens policies and cultural traditions of numerous countries.[6] While it falls in line with the KJWA's focus on livestock, it follows the same logic as the mitigation argument, which appears to deemphasize the role of food autonomy and global food sovereignty in favor of climate mitigation efforts that allow major parties to sidestep meaningful action.

Further, the KJWA offers countries to increase access to finance through mechanisms such as the Green Climate Fund, in order to implement KJWA and National Adaptation Plans. Climate finance ties the effectiveness of mitigation and adaptation practices to monetary systems that are vulnerable to both the risks and fluctuations of the market and gives

5 Moosmann, Lorenz, Anne Siemons, Felix Fallasch, Lambert Schneider, Cristina Urrutia, Nora Wissner, and D. Oppelt. 2021. The COP26 climate change conference. In the Glasgow climate change conference—October-November. https://www.gfa-group.de/news/647420/ENVI_Study_2022_Climate_Change_Conference.pdf

6 Moosmann, Lorenz, Anne Siemons, Felix Fallasch, Lambert Schneider, Cristina Urrutia, Nora Wissner, Roman Mendelevitch, Hauke Hermann, Sean Healy, Dietram Oppelt, and Stefanie Heinemann. 2022. The COP27 climate change conference: status of climate negotiations and issues at stake. Study for the Committee on the Environment, Public Health and Food Safety, Policy Department for Economic, Scientific and Quality of Life Policies. European Parliament, Luxembourg. https://www.europarl.europa.eu/RegData/etudes/STUD/2021/695459/IPOL_STU(2021)695459_EN.pdf

power to financial institutions (for a complete analysis on climate finance in the lead up to COP27, see the Climate Finance briefing in the series).[7] Under the logic of climate finance, "climate solutions must be profitable to be effective, when in reality it is the endless search for profit that has driven us to the current state of climate catastrophe."[8] Climate solutions that rely on finance to fuel meaningful change obscure the real roots of the climate change problem, namely leaving fossil fuels in the ground.

WHAT IS CLIMATE-SMART AGRICULTURE?

The term "climate-smart agriculture" was first used in 2009 by the United Nations (UN) as a way for agricultural-based adaptation and mitigation strategies to enter climate negotiations.[9] According to the International Panel on Climate Change (IPCC), the global food system is estimated to contribute as much as 37 percent of total greenhouse gas emissions (GHGs).[10] As climate change also threatens the future of food and agriculture, proponents of CSA claim that CSA can combat climate change and secure food production by increasing productivity, adapting climate resilient practices, and removing and/or reducing GHGs.[11]

So called "climate-smart" agriculture has infiltrated a vast number of global and national policies, organizational missions, and agricultural projects due to its promotion through the UN's Food and Agriculture Organization (FAO). The UN's embrace of CSA further includes financial backing by the World Bank, research support from the Consultative Group in Agricultural Research, and policy support from the UN's Framework Convention on Climate Change. It has also garnered the embrace of corporate conglomerates such as General Mills, McDonald's, Walmart, and PepsiCo., who also use CSA as a tool for promoting Corporate Social Responsibility.[12] CSA's flagship initiative, the Global Alliance for Climate-Smart Agriculture (GACSA) includes over 500 members that amass investment and corporate interests to drive the global "climate-smart" agenda forward.

7 Soto-Danseco, Elisa, Tamra Gilbertson, Nam Pham, and Joshua Witchger. 2022. Climate Finance. Indigenous Environmental Network. https://www.ienearth.org/climate-finance/

8 Ibid

9 FAO. 2009. Food Security and Agricultural Mitigation in developing Countries: Options for Capturing Synergies. doi: 10.13140/RG.2.1.5066.9524

10 IPCC. 2019. Food Security. In: Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems. Cambridge University Press. pp. 438-550. https://www.ipcc.ch/site/assets/uploads/2019/11/08_Chapter-5.pdf

11 FOA. 2010. Climate-Smart Agriculture: Policies, Practices and Financing for Food Security, Adaptation and Mitigation. Food and Agricultural Organization of the United Nations. www.fao.org/docrep/013/i1881e/i1881e00.pdf

12 Karlsson, Linus, Lars Otto Naess, Andrea Nightingale, and John Thompson. 2018. 'Triple wins' or 'triple faults'? Analysing the equity implications of policy discourses on climate-smart agriculture (CSA). The journal of peasant studies 45, no. 1: 150-174. doi: 10.1080/03066150.2017.1351433

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CONSULTATIVE GROUP IN AGRICULTURAL RESEARCH

In tune with CSA's "triple-win" agenda, examples of "climate-smart" practices largely ignore principles of food sovereignty and instead promote market-based, corporate solutions.

One way the World Bank and FAO report the effectiveness and future considerations of climate-smart practices is through publishing periodic country profiles, current project reports and assessment tools. In tune with CSA's "triple-win" agenda, examples of "climate-smart" practices largely ignore principles of food sovereignty and instead promote market-based, corporate solutions. For example, in Sri Lanka the Department of Agriculture has partnered with farmers to provide "access to new, climate-adapted genetic material," while also generating carbon credits for compliance and voluntary markets.[13] In Kenya, CSA interventions seek to combat extreme weather by investing in both "new, improved seeds," and "drought-resistant seeds."[14] And in Uganda, an early CSA project gave 1,250 farmers climate-smart seeds, pesticides, and fertilizers, along with a one acre plot of land, in order to teach more farmers the practices of CSA.[15]

THE FAILURES OF "CLIMATE-SMART" AGRICULTURE

As CSA scales up, its grip on global food and agriculture poses threats to Indigenous Peoples' self-determination. Through the manipulation of power, marketization, financialization, farming practices, knowledge, and security, "climate-smart" solutions continue "business as usual" practices while greenwashing public perception.

+ CSA MAINTAINS DOMINANT POWER

CSA is a concept that has been born and nurtured through a colonialist, corporate agenda with the goal of increasing profit and production. While promoters put much effort into making CSA appear as if it considers the needs of Indigenous Peoples and small farming communities, farmers on the ground, like La Via Campesina's Latin American Coordination of Rural Organizations (CLOC), calls "climate-smart" farming a trap, stating that CSA is instead about "enriching the multinationals, selling climate-resistant genetically-modified seeds, pesticides, [and] herbicides...."[16]

13 Climate-Smart Agriculture in Sri Lanka. 2015. Consultative Group for International Agricultural Research. September. See: https://cgspace.cgiar.org/bitstream/handle/10568/69548/CSA%20in%20Sri%20Lanka.pdf?sequence=1&isAllowed=y

14 Climate-Smart Agriculture in Sri Lanka. 2015. Consultative Group for International Agricultural Research. September. See: https://cgspace.cgiar.org/bitstream/handle/10568/69548/CSA%20in%20Sri%20Lanka.pdf?sequence=1&isAllowed=y

15 United Nations Development Plan. 2014. Terminal evaluation of enhancing adoption of climate-smart agriculture practices in Uganda's farming systems, executive summary. https://erc.undp.org/evaluation/evaluations/detail/8256

16 La Via Campesina. 2014. Peasant and Small-Scale Agriculture vs. Climate-Smart Agriculture. https://viacampesina.org/en/peasant-and-small-scale-agriculture-vs-climate-smart-agriculture/

Rather than supporting Traditional Indigenous Knowledge, agroecological climate solutions and food sovereignty, control and power is exerted for the purpose of supporting the agenda of multinational corporations in the name of the climate crisis.

CSA is embraced by modern industrial agriculture, a system that operates on consolidation and expansion. Big Ag expands at the expense of Indigenous Peoples' self-determination and land rights. Both state and private actors eager to profit from land and resource grabbing cause displacement, and a loss of cultural and traditional practices.[17] Now, through the support and investment of powerful corporations, including pharmaceuticals, chemicals, fossil fuels, agribusinesses, and billionaires like Bill Gates, the strategies of CSA are promoted on a global level.[18] Further, the development and application of CSA is incentivized through national policy in many countries, including Brazil, Ethiopia, and New Zealand.[19] Increasingly, proprietary technologies such as app-based farm management and "climate-smart" GMOs reinforce dominant structures of power and capital.[20] With governments and powerful institutions administering grants and financial assistance to agricultural projects of their choosing, CSA is painted as the only viable way forward for the future of farming. Indigenous sovereignty, especially land, grazing rights, and water use, are increasingly under threat as the CSA agenda continues to influence government actors and public policy makers.

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17 Figueroa-Helland, Leonardo, et. al. 2018. Decolonizing Food Systems: Food Sovereignty, Indigenous Revitalization, and Agroecology as Counter-Hegemonic Movements. Perspectives on Global Development and Technology, 17: 197-201. doi: 10.1163/15691497-12341473

18 GRAIN. 2015. The Exxons of agriculture. https://grain.org/article/entries/5270-the-%20exxons-of-agriculture

19 Negra, Christine, Sonja Vermeulen, Luís Gustavo Barioni, Tekalign Mamo, Paul Melville, and Melaku Tadesse. 2014. Brazil, Ethiopia, and New Zealand lead the way on climate-smart agriculture. Agriculture & Food Security 3, no.1: 1-6.

20 GRAIN. 2020. Digital Control: How Big Tech Moves Into Food and Farming and What It Means.https://grain.org/en/article/6595-digital-control-how-big-tech-moves-into-food-and-farming-and-what-it-means

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+ CLIMATE-SMART AGRICULTURE ENCOURAGES COMMODIFICATION OF MOTHER EARTH

CSA prizes agricultural actors that enable carbon offsets and payments. Market-based mechanisms threaten the future of Indigenous self-determination as the quest for GHG reductions fuel new pursuits of land-grabbing for carbon accounting, forced land-use changes and coercion. At the same time, Indigenous Peoples, environmental justice and frontline communities are impacted by continued pollution.

Soil offsets in particular have grown as voluntary carbon markets and third party actors use CSA as a means to profit from carbon trading.[21] Carbon markets perpetuate fossil fuels combustion by incentivizing industries to subtract their total emissions by purchasing carbon offsets rather than directly cutting emissions at source. As a result, Indigenous Peoples and frontline communities continue to experience the debilitating impacts of industrial pollution while CSA fails to adequately address issues of environmental justice and equity.[22] [23]

SOIL OFFSETS: A QUICK EXPLANATION

Soil offsets present a key strategy for CSA to commodify, marketize and financialize GHG reductions through agriculture and conservation programs. Agricultural soil in particular is targeted for its potential role in climate mitigation as it covers roughly 38% of global land.[24] The logic goes, by sequestering the carbon from the atmosphere and into the soil through crops, trees, grasslands, and plants, global GHGs could be removed and safely offset GHGs.[25] These gains can then become sold or traded on carbon markets so polluters can buy the credits and claim carbon neutrality or net-zero emissions and continue to pollute. As soil offset markets grow, Indigenous Peoples' lands and forests, to which they have an inherent relationship with, and which are particularly rich repositories for carbon and biodiversity, are increasingly coveted for their so-called ecosystem services. Indigenous Peoples' self-determination and livelihoods are

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21 Engell, Stefanie and Adrian Muller. 2016. Payments for environmental services to promote "climate-smart agriculture"? Potential and challenges. Agricultural Economics, 47:,173-184. Retrieved from https://doi:.org/10.1111/agec.12307

22 EPA. 2021. Climate Change and Social Vulnerability in the United States. Environmental Protection Agency. https://www.epa.gov/system/files/documents/2021-09/climate-vulnerability_september-2021_508.pdf

23 Clapp, Jennifer, Newell, Peter, and Zoe W. Brent. 2018. The global political economy of climate change, agriculture and food systems, The Journal of Peasant Studies 45, no. 1: 80-88. doi: 10.1080/03066150.2017.1381602

24 FAO. 2021. World Food and Agriculture – Statistical Yearbook 2021. Rome, Italy. doi:10.4060/cb4477en

25 Paul, Helena, et. al. 2009. Agriculture and climate change: Real problems, false solutions. Preliminary report by Econexus, Biofuelwatch, Grupo de Reflexion Rural and NOAH. https://www.econexus.info/files/Agriculture_climate_change_copenhagen_2009.pdf

threatened by the expansion of soil offsets and carbon markets, as the quest for soil carbon as a traded item in carbonmarkets expand.[26]

THE PROBLEM WITH SOIL OFFSETS

Practically, soil offsets raise several concerns for use in carbon markets. First, the impermanence of soil carbon presents a dangerous protocol for markets that sell credits to polluters. Plowing the soil, land-use change or a wildfire can instantly disturb soil and release the GHGs, thereby undoing or nullifying the validity of purchased carbon credits.[27] Second, tools and techniques to measure the amount of soil carbon and monitor its permanence are developed by promoters of CSA who seek to set up methodologies that are not permanent, and presently claim the highest carbon sequestration gains on large-scale monocrops like GMO corn fields.[28] However, soil carbon levels are also known to fluctuate depending on soil quality, measurement location, depth, and land use practices.[29] Third, soil offsets for market sales ignore the fundamental differences between fossil carbon and soil carbon cycles. Cropland is not an unlimited sponge to absorb fossil-derived GHGs. In fact, due to the differences between fast and slow carbon cycles, there will never be enough storage for fossil carbon in soil as long as fossil fuels keep saturating the atmosphere with GHGs.[30] While the science of soil carbon presents numerous challenges for the large-scale embrace of offsets as climate mitigation, strong efforts among CSA advocates are underway to increase its validity and greenwash its way into policy.

THE CURRENT STATE OF SOIL OFFSETS

The United States is a particularly salient example of soil offset schemes. In the US, both compliance and voluntary carbon markets allow agriculture offsets in the form of methane emissions reductions largely for livestock manure biodigesters and soil offsets. At the time of writing, soil offsets remain exclusive to voluntary markets.[31] In voluntary carbon markets, standards for soil carbon sequestration vary widely based on existing or new practices, length of contract, compensation for practices, certification of offsets, and verification of soil carbon permanence. Indigo Ag, the highest valued agri-tech company in the US, believes its verification criteria to be so rigorous it claims to reward farmers $30/

26 Bourke, India. 2021. A further act of colonisation: why indigenous peoples fear carbon offsetting. The New Statesman. https://www.newstatesman.com/environment/climate/2021/11/a-further-act-of-colonisation-why-indigenous-peoples-fear-carbon-offsetting

27 Stockmann, Uta. et. al. 2013. The Knowns, Known Unknowns, and Unknowns of Sequestration of Soil Organic Carbon. Agriculture, Ecosystems and Environment, 164: 80-99. doi: 10.1016/j.agee.2012.10.001.

28 Thamo, Tas, and David J. Pannell. 2016. Challenges in Developing Effective Policy for Soil Carbon Sequestration: Perspectives on Additionality, Leakage, and Permanence. Climate Policy no. 16(8): 973-992. doi: 10.1080/14693062.2015.1075372.

29 Paustian, Keith, et. al. 2019. Quantifying carbon for agricultural soil management: from the current status toward a global soil information system. Carbon Management no. 10(6): 567-587. doi: 10.1080/17583004.2019.1633231

30 Riebeek, Holli. 2011. The Carbon Cycle. Earth Observatory. https://earthobservatory.nasa.gov/features/CarbonCycle

31 Congressional Research Service. 2021. Agriculture and Forestry Offsets in Carbon Markets: Background and Selected Issues. https://crsreports.congress.gov/product/pdf/R/R46956

ton for sequestered CO2, a figure nearly double the amount of other domestic voluntary markets.[32] In compliance markets, both the California cap-and-trade and the Regional Greenhouse Gas Initiative (RGGI) have held back on allowing soil offset methodology due to its complicated and impermanent nature. But many influential actors, including the World Bank and Syngenta, are vocally advocating for the larger allowance of soil offsets into commodity markets.[33,34] Certain groups, such as the World Bank's Partnership for Market Readiness have even developed pilot programs, reports, and other literature anticipating the inclusion of soil offsets into broader commodity markets.[35] As carbon markets begin to incorporate soil offsets, farmers and buyers must be aware that soil carbon measurement tools are only able to provide reliable results in predictable, single-practice fields.[36] Thus, the methodologies of verifying soil offsets are dependent on the continuance of industrial-driven, monocrop agriculture. Proven field practices that bolster climate resilience, such as intercropping and diversified plantings, cover crops, crop rotations, and other farming methods are not compatible with carbon markets that reward farmers for destructive practice because the carbon traders argue that these practices were already happening so there is no "additionality."

> "Climate-smart" farming normalizes new, unproven, or even dangerous technologies alongside regenerative agroecological practices that improve soil health.

THE GROWING CLIMATE SOLUTIONS ACT

In June 2021, The US Senate passed the Growing Climate Solutions Act (GCSA), which aims to increase farmer participation in voluntary carbon markets.[37] The GCSA aims to boost the legitimacy of soil offsets and assuage its critics by enlisting the USDA to establish certification standards and protocols, while keeping a detailed, public carbon bank. Some of the dangers this poses to Indigenous Peoples, farmers and communities is the increased potential for land-grabbing, forced land use changes, and coercion of outside influence as Indigenous lands are both sizable and carbon-rich. Further, the GCSA presents an additional concern because it uses a federal agency to frame the process and legitimize soil offsets.

32 Applebaum, Michael. August 29, 2022. Announcing Indigo's Carbon Payment Rate for the 2020 and 2021 Crops. Indigo Agriculture. https://www.indigoag.com/blog/announcing-indigo-carbon-payment-rate-for-the-2020-and-2021-crops?hsLang=en-us

33 Newell, Peter, and Olivia Taylor. 2018. Contested landscapes: the global political economy of climate-smart agriculture. The Journal of Peasant Studies, 45, no. 1:108-129. doi: 10.1080/03066150.2017.1324426

34 Syngenta Foundation. n.d. Carbon credits to incentivize sustainable farming. https://www.syngentafoundation.org/carbon-credits-incentivize-sustainable-farming

35 International Emissions Trading Association. 2020.Greenhouse Gas Market Report.https://www.ieta.org/resources/Conferences_Events/2020/IETA%202020%20GHG%20Report_WEB.pdf

36 National Tribal and Indigenous Climate Conference Webinar. 2022. Indigo Ag presentation in, "Removing barriers to accessing carbon markets for Native American farmers, ranchers, and forest managers." Author participation. 29 August 2022.

37 S. 1251 — 117th Congress. 2021-2022. Growing Climate Solutions Act of 2021. https://www.congress.gov/bill/117th-congress/senate-bill/1251

Voluntary carbon markets have been set up by the private sector since their inception in order to play by their own rules and bypass government regulations. With over a dozen private carbon markets operating in the US, including some whose main focus is soil offsets, the GCSA would enable the USDA to assist private enterprises by crafting lenient rules, such as its proposed system of "self certification" for third party carbon verifiers and technical assistance providers.[38] Ultimately, under GCSA, the federal government would re-orchestrate the rules to expand the profiteering of voluntary markets while setting the stage for a national carbon trading system. As the GCSA awaits a final decision by the House before becoming law, the USDA and "climate-smart" farming advocates could further deceive the public into believing that agriculture and soil offsets are good and necessary responses to the climate crisis. Just because it is called "climate-smart" does not mean that it is. As the US Farm Bill will be renewed in 2023, there is a high risk of the GCSA and other mechanisms becoming federal policy.

+ CSA PROMOTES BOTH BENEFICIAL AND HARMFUL FARMING TECHNIQUES UNDER AMBIGUOUS CRITERIA

CSA confuses agriculture techniques by encouraging the growth of large-scale industrial farming alongside the promotion of Indigenous and regenerative agroecological practices. This tactic allows CSA to encompass a wide range of acceptable practices and win broad public support, while ignoring certain realities that perpetuate the climate crisis.

"Climate-smart" farming normalizes new, unproven, or even dangerous technologies alongside regenerative agroecological practices that improve soil health. Under CSA, farmers may employ synthetic biology, genetic engineering, or nuclear technology to procure crops that conserve water, enhance yields, and lessen fertilizer and pesticide use.[39,40] While at the same time Indigenous and agroecological practices are demonstrated as key focuses, such as crop rotation, cover cropping, succession planting, and no-till agriculture. However, CSA will likely only benefit the large-scale monocrops and ranchers who can claim "additionality," meaning the GHG reduction, or climate benefit, would not have happened without it being tied to a carbon credit. Without clear definitions, many "solutions" may actually corrupt efforts to support agroecological practices and uphold Traditional Indigenous Knowledge. In addition to being misleading, the promoters of CSA are exploiting good agricultural practices and traditions to make money from the damaging practices.

38 S. 1251 — 117th Congress. 2021-2022. Growing Climate Solutions Act of 2021.https://www.congress.gov/bill/117th-congress/senate-bill/1251/text

39 ETC Group and Heinrich Boll Stiftung. 2015. Outsmarting Nature: Synthetic Biology and climate-smart Agriculture.https://www.etcgroup.org/sites/www.etcgroup.org/files/files/outsmart_a4report_v5_0.pdf

40 FAO. 2016. Nuclear Techniques for climate-smart Agriculture.Rome, Italy: Food and Agriculture Organization of the United Nations. https://www.fao.org/3/i6180e/i6180e.pdf

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THE MISNOMER OF NO-TILL AGRICULTURE

No-till agriculture has been a chief misnomer in the "climate-smart" world. In contrast to its name, "no-till" farming does not cast seed onto the soil's surface and hope for the best. In the best practice, it uses a single thin slice for seeds to take root while minimally disturbing the majority of surrounding cropland soil. It is a centuries-old agricultural practice that minimizes soil compaction and fuels a vibrant soil ecology, while leaving carbon absorbed by vegetation underground. In the worst practices, used by Big Ag industrial farming and likely encouraged by CSA, no-till agriculture uses GMO crops. Instead of tilling with machinery to control weeds, herbicides such as glyphosate are used to kill off the plants that are not genetically modified to withstand the poison. The International Agency for Research on Cancer (IARC) rates glyphosate in the second highest category of cancer-causing substances: "probably carcinogenic to humans (Group 2A)."[41]

In the US, both compliance and voluntary carbon markets allow agriculture offsets in the form of methane emissions reductions largely for livestock manure biodigesters and soil offsets. At the time of writing, soil offsets remain exclusive to voluntary markets.

CSA'S EMBRACE OF "NO-TILL" FARMING IS PROBLEMATIC BECAUSE...

- Under a CSA framework, the "no-till" practices of agroecology and the "no-till" practices of large-scale industrial GMO farming are equal.
- Certain genetically modified crops are classified as "no-till." This allows farmers to claim to be "no-till" while ignoring their support of the seed and chemical industry, which derive many of their products from fossil fuels.
- Farms are able to claim "no-till" to earn subsidies and payments for soil offsets, while the permanence of these practices may last as short as one year.
- At an industrial scale, no-till farming can increase fertilizer and pesticide use, especially in the early years of adopting "no-till" farming, when weeds are not regularly uprooted via tillage, many farmers increase their use of fertilizer and pesticides to ensure yields.
- "No-till" allows farms to generate soil offsets to be used in voluntary carbon markets.

41 World Health Organization. 2015. IARC Monograph on Glyphosate. See: https://www.iarc.who.int/featured-news/media-centre-iarc-news-glyphosate/ Note: The the IARC ratings: 1) Carcinogenic to humans, 2A) Probably carcinogenic to humans, 2B) Possibly carcinogenic to humans, 3) Not classifiable as to its carcinogenicity to humans.

- No-till has expanded to include "conservation tillage," a moniker that includes variations on tilling such as partial tillage, limited tillage, ridge tillage, and strip tillage.[42] While "conservation tillage" is promoted as a "climate-smart" technique, not all "conservation tillage" practices are equal in the amount of soil it disturbs.

AGRICULTURAL CONSERVATION PROGRAMS

While marketized solutions like carbon offsets gain traction in the policy arena for counting molecules to quantify climate mitigation, many non-marketized approaches for sustainable farming are increasingly under threat by the CSA agenda. In the US, Farm Bill conservation programs such as the Environmental Quality Incentives Program (EQIP) and the Conservation Stewardship Program (CSP) enable farmers to directly enact regenerative land-based practices that promote ecological health and increase biodiversity by single project or farm-wide application. Other programs, like the Conservation Reserve Program (CRP), take vulnerable, erodible, or sensitive land out of production for periods of time to encourage restoration and regeneration, including specific initiatives that work with grasslands, waters, and wildlife. While agricultural conservation programs can allow Indigenous Peoples and small farmers to engage in agroecological farming, many of these programs are increasingly incorporating incentives for CSA, such as schemes to quantify carbon.[43] At the same time, Farm Bill conservation programs are underfunded and are forced to deny significant numbers of applicants, which allows the USDA and its increasingly CSA-friendly agenda to call the shots. Ultimately, agricultural conservation programs can be valuable resources for Indigenous and small farmer-led initiatives, but they are being overshadowed by the carbon market frenzy.

While agricultural conservation programs can allow Indigenous Peoples and small farmers to engage in agroecological farming, many of these programs are increasingly incorporating incentives for CSA, such as schemes to quantify carbon.

42 UC Sustainable Agriculture Research and Education Program. 2017. Conservation Tillage. What is Sustainable Agriculture? UC Division of Agriculture and Natural Resources. https://sarep.ucdavis.edu/sustainable-ag/conservation-tillage

43 For example, the CRP offers 3, 5, and 10% incentives per acre for incorporating CSA. See also the Inflation Reduction Act of 2022 which provides increased funding to four Farm Bill conservation programs to prioritize carbon sequestration and GHG reduction.

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+ CSA EXPANDS COLONIAL FRONTIERS AND PRIORITIZES "EXPERT" KNOWLEDGE

CSA is a top-down structure where the highest forms of institutional power and knowledge set the priorities and shape the "climate-smart" agenda. In CSA's short history, it has amassed a large collection of research and reports by the World Bank, FAO, and other influential entities that promote a Western agenda of economic and agricultural development. Additionally, much of its literature comes out of universities, research labs, and organizations that advocate in favor of CSA, and reinforce its authority over what practices are, or are not "successful."[44] Not only is the CSA framework manipulative, but its imposition on farms across the globe requires farmers to cede expertise to outside "technical assistants."

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To many small, rural, and Indigenous farmers, the passing down of traditional Indigenous and farming knowledge is based on cultural and spiritual traditions. The use of intuition and experience to sustain cultural practices, especially around farming and food production, has been a tool of survival. However, as CSA infiltrates rural and Indigenous communities, its' prizing of Eurocentric, scientific knowledge erases the critical importance of Traditional Indigenous Knowledge. Ogunyiola et.al. (2022) describes how this plays out in Africa,

> The transition of African smallholder farmers to using CSA requires them to become comfortable with learning new approaches to farming, trusting new knowledge and related advisory support systems, and transacting in new markets... implementing CSA requires some smallholder farmers to adopt genetically modified (GM) crops or participate in new agricultural supply chains. In doing so, smallholder farmers' may have to surrender their traditional ecological knowledge and technological means of controlling weeds, pests, plants, and harvests.[45]

As the CSA agenda pushes its own form of knowledge, some governing organizations are attempting to bridge the gap by recruiting Indigenous Peoples for the use of Traditional Ecological Knowledge (TEK) in climate mitigation and adaptation.[46] While the industry shows a growing interest in Traditional Ecological Knowledge (TEK), especially for the ways it could benefit conservation and management agendas,[47] it does not appear

44 Newell, Peter, and Olivia Taylor. 2018. Contested landscapes: the global political economy of climate-smart agriculture. The Journal of Peasant Studies, 45, no. 1:108-129. doi: 10.1080/03066150.2017.1324426

45 Ogunyiola, Ayorinde, Maaz Gardezi, and Sumit Vij. 2022. Smallholder farmers' engagement with climate-smart agriculture in Africa: role of local knowledge and upscaling. Climate Policy, 22:4, 411-426. DOI: 10.1080/14693062.2021.2023451

46 Amberson, Sophia. 2017. Traditional Ecological Disclosure: How the Freedom of Information Act Frustrates Tribal Natural Resource Consultation with Federal Agencies.Washington Law Review no.92: 937. https://digitalcommons.law.uw.edu/wlr/vol92/iss2/8

47 Rosa-Anqino, Paola. 2018. To share or not to share? Tribes risk exploitation when sharing climate change solutions. Grist. https://grist.org/article/indigenous-knowledge-climate-change-solution/

to offer it a central role, nor is it clear how it plans to employ TEK or consider the impacts this may have for Indigenous Peoples. The issue with Indigenous Peoples is that TEK is a non-Indigenous incorporation of Traditional Indigenous Knowledge (TIK) under a eurocentric umbrella framework. Such examples are rarely opportunities to center Indigenous Peoples or address the violence of colonialism, but are often extractive methods of knowledge appropriation for the benefit of colonial capitalist agendas. Sharing TIK inclusive of the more limited TEK has the potential to exploit Indigenous knowledge without the assurance that it will be employed rightly or without stipulation for the future of Indigenous Peoples.[48]

USDA'S "PARTNERSHIP FOR CLIMATE-SMART COMMODITIES"

The USDA's 2022 program, "Partnership for climate-smart commodities," provides funding to farmers for developing new CSA projects. Under the Partnership, farmers establish pilot projects with the goal of providing the USDA with templates for employing CSA nationwide, including new prospects for building market-based carbon offset programs.[49] As of September 2022, USDA Secretary Tom Vilsack announced the program's initial results would increase funding from $1 billion to more than $3 billion and include over 70 projects.[50] Many of the newly approved projects are orchestrated, and/or supported by chemical, agribusiness, and oil companies such as Exxon/Mobile, Corteva, Bayer, and carbon market developer Truterra.[51] The USDA has praised this program for its potential benefits to small and disadvantaged farmers, but issues such as the short proposal deadline, the amount of baseline funding, and the preferential treatment for proposals that provide "matching funds," or non-Federal financial backing, may exclude many Indigenous and small-scale sustainable farmers. [52] The program has claimed it does not wish to put "early adopters" of climate-conscious farming at a disadvantage, but by preventing "current" projects from receiving funds, in favor of new projects on the horizon, the USDA is hurting Indigenous, small-scale and marginalized frontline farmers that are staying ahead of the curve. The program additionally encourages Tribal Governments and communities to participate in the initiative by assuring that funded Tribal projects can remain under Tribal control and discretion, especially when it comes to developing practices for national adoption.[53] The USDA's latest

48 Ibid.

49 USDA. 2022. Partnerships for climate-smart Commodities. https://www.usda.gov/sites/default/files/documents/partnerships-climate-smart-commodities-web inar-second-funding-pool-tribal-outreach-ppt.pdf

50 USDA. Sept. 14, 2022. Biden-Harris Administration Announces Historic Investment in Partnerships for 70 Climate-Smart Commodities and Rural Projects. Press Release. https://www.usda.gov/media/press-releases/2022/09/14/biden-harris-administration-announces-historic-investment

51 USDA. 2022. Partnerships for climate-smart Commodities.https://www.usda.gov/climate-solutions/climate-smartcommodities

52 USDA. 2022. Partnerships for climate-smart Commodities. Presented at the Second Funding Pool Tribal Outreach webinar, May 25, 2022. https://www.usda.gov/sites/default/files/documents/partnerships-climate-smart-commodities-webinar-second-funding-pool-tribal-outreach-ppt.pdf

53 Ibid.

Partnership program follows the same old CSA trajectory which seeks to engage both large-scale technological mitigation projects that receive the largest project funding, as well as Traditional Ecological Knowledge and practices related to conservation and land use that are tokenized to legitimize the program.

+ CSA PRIZES A FALSE FOOD SECURITY ARGUMENT OVER INDIGENOUS FOOD SOVEREIGNTY

Dominant structures of power and profit driven agriculture are driving forward a "climate-smart" agenda that promotes a false message of food security over food sovereignty. The FAO predicts that in order to meet the growing demands of food and feed, global agriculture will need to increase production by 60 percent by 2050.[54] One way CSA seeks to meet this goal is by increasing yields through the use of technology. "Feeding the world" not only means using GMO seeds that have been programmed to resist pesticides and withstand drought, but increasingly it means using app-based software to process farm data and develop agribusiness "solutions".[55] These emerging strategies are not targeted to assist the seventy (70) percent of small farmers that actually feed the world,[56] but are set to increase profits, yields, and tools to boost big business and industrial farming that are harming Mother Earth. As tech companies, agribusinesses, and governments partner to increase food production for a growing world, the farmers utilizing these services become hooked into a system of dependence where data is exchanged for "climate-smart" products. The emerging practices of CSA may assist goals to increase production, yet we must ask what type of food is being produced when the tactics become increasingly less land-based, with less laborers, and under less control? Trusting agribusiness to solve the climate crisis by using the same "solutions" that continue to spur the climate crisis will not solve anything, nor will it encourage Indigenous self-determination or promote autonomy for small farmers.

...we must ask what type of food is being produced when the tactics become increasingly less land-based, with less laborers, and under less control of Traditional Indigenous Knowledge?

54 FAO. 2013. Climate-smart agriculture: sourcebook. Rome, Italy: Food and Agriculture Organization of the United Nations.

55 GRAIN. 2020. Digital Control: How Big Tech Moves Into Food and Farming and What It Means.https://grain.org/en/article/6595-digital-control-how-big-tech-moves-into-food-and-farming-and-what-it-means

56 ETC Group. 2022. Do Small-Scale Farmers and Peasants Still Feed the World? https://www.etcgroup.org/files/files/31-01-2022_small-scale_farmers_and_peasants_still_feed_the_world.pdf

CSA AND DIGITAL FARMING

Big Ag is already incorporating technology such as artificial intelligence, machine learning, and drone surveillance to provide farmers with new tools to better monitor fields. These and other technologies are part of the growing framework of "digital farming" or "precision agriculture," that uses big data to increase productivity, minimize costs, and maximize efficiency. However, little attention has been paid to the potential dangers these practices pose to Indigenous Peoples and small farming communities.

The biggest advocates for, and funders of, these technologies are the same transnational corporations and chemical companies fueling the climate crisis.[57] Digital farming is not a new solution to better food production, but a repackaged presentation of industrial agriculture to monopolize, surveil and profit. The expansion of surveillance technologies, field analytics, and app-based assessments paints a future where farming is increasingly a numbers game orchestrated behind a screen.

As tools of digital farming and precision agriculture are pushed into the mainstream, how will mass surveillance disguised as agribusiness technology impact sovereignty, land-use, and treaty laws? Who stands to profit and who loses as mass surveillance and data harvesting is normalized in agriculture?

CONCLUSION

Climate-Smart Agriculture promotes a mixture of broad conservation practices disguised as climate change mitigation, which co-opts Traditional Indigenous Knowledge and agroecological approaches and exploits them alongside Big Ag and market-based solutions. Climate-smart agriculture operates under dominant systems of power to forward an agenda of food security over food sovereignty. Under these strategies, CSA causes confusion and leads to division. Despite CSA's promotion among development agencies, governments, financial institutions, conservation NGOs, and corporations to secure food production and combat climate change, a reading between the lines reveals that CSA reinforces the prevailing paradigms of capitalist colonial powers that have caused the climate crisis.

Truly regenerative and ecologically-minded farming must center Indigenous Peoples. For centuries, a diverse multitude of Indigenous, small farmers and producers have been feeding a majority of the world's population; this has not been the role of big agribusiness.[58] Indigenous and small farmers, ranchers, and producers sustain their livelihoods and

57 GRAIN. 2020. Digital Control: How Big Tech Moves Into Food and Farming and What It Means. https://grain.org/en/article/6595-digital-control-how-big-tech-moves-into-food-and-farming-and-what-it-means

58 ETC Group. 2022. Do Small-Scale Farmers and Peasants Still Feed the World? https://www.etcgroup.org/files/files/31-01-2022_small-scale_farmers_and_peasants_still_feed_the_world.pdf

traditions by sharing farmer-to-farmer knowledge, including the use of cultural traditions, practices, techniques, seeds, tools, spirituality, and worldviews. Working toward equitable, mutually enhancing, and just solutions means that resistance to the latest CSA schemes from Indigenous and local farmers is critical for food sovereignty and climate justice. There is a future for smart, climate-focused farming, but it cannot be under the global banner of corporate-led "climate-smart" agriculture.

Therefore, agriculture strategies based on system change should foreground and center Indigneous Peoples' self-determination, Indigenous sovereignty, Indigenous laws and jurisprudence, territorial rights, demarcation of ancestral lands, Traditional Indigenous Knowledge, debt cancellation, keeping it in the ground, and greater jurisdictional authority of Indigenous Peoples.