

ID: 718

Corporates' commitments from Net Zero to ESG Goal: Agri-Net Zero is the best pathway to attain Climate Action and Livelihood sustenance.

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Abstract

This paper presents Agri-Net Zero as the optimal pathway for corporate net zero compliance, emphasizing its dual role in advancing climate action while ensuring sustainable livelihoods. In the wake of accelerating climate change and the urgent need to stabilize global warming within critical thresholds, the integration of direct emission reductions and nature-based carbon sequestration in agricultural systems emerges as a transformative solution. Agriculture is highlighted as both a significant contributor to greenhouse gas emissions and a uniquely positioned sector capable of acting as a large-scale carbon sink. Through regenerative practices such as agroforestry, sustainable livestock management, and advanced soil health techniques, Agri-Net Zero enables corporations to achieve immediate and measurable decarbonization in line with stringent IPCC guidelines.

The paper examines global trends and corporate commitments to net zero targets and ESG goals, contextualizing the role of agriculture within broader mitigation strategies. It further presents the Clean Food Net Zero (CFNZ) program under the IBM-IORF Sustainability Project as a practical demonstration of the multifaceted impact of Agri-Net Zero. The CFNZ program's innovative "waste-to-wealth" strategy and integrated sustainability tools not only reduce greenhouse gas emissions significantly but also enhance energy efficiency, resource utilization, and overall economic viability.

By repositioning agriculture from an emissions-intensive sector to a critical component of the global carbon cycle, Agri-Net Zero provides a comprehensive, scalable, and economically viable model. This paper argues that through proactive adoption of Agri-Net Zero, corporations can bridge the gap between environmental imperatives and sustainable development, simultaneously achieving robust net zero compliance and bolstering food and livelihood security in a climate-uncertain future.

Key words : Carbon sink, Waste to wealth, Net Zero, ESG, CFNZ program

Introduction

Corporates' commitments to achieve net-zero emissions and advance robust ESG goals are emerging as a linchpin in the global effort to combat climate change and ensure sustainable livelihoods, with Agri-Net Zero at the forefront as a transformative pathway. Scientific consensus underscores that global temperatures, which have already risen by 1.1°C above pre-industrial levels between 2011 and 2020, must be capped at 1.5°C to 2°C by 2050 to avert devastating impacts, yet projections indicate a potential 2.8°C increase if current measures remain insufficient (WMO, 2024). Globally, nearly 9,000 companies have pledged to reduce emissions—with approximately 3,500 targeting net-zero outcomes—while Europe leads with 2,998 firms, Asia follows with 1,846, and the UK accounts for 702 companies committed to Science-Based Targets. In India, despite contributing roughly 7% to global emissions, 127 corporates have embraced net-zero targets under the ICRA ESG Ratings framework, signalling a burgeoning awareness, particularly as sectors such as power, energy, and cement lag behind (ET World, 2024). The drive toward net zero is not solely an environmental imperative; it is also fuelled by escalating investor pressure, anticipated regulatory shifts, and evolving consumer preferences that favor sustainability, all of which compel companies to innovate in renewable energy, energy efficiency, and sustainable supply chain practices. Notably, even as more than one-third of the world's largest companies have endorsed net zero commitments, analyses suggest that without at least doubling the current pace of emissions reduction by 2030, 93% are at risk of failing to meet their targets.

Agri-Net Zero presents an exceptionally compelling pathway for corporates to meet their net zero commitments because it directly tackles one of the most significant yet often under-addressed sources of greenhouse gas emissions—agriculture. Agriculture accounts for approximately 10–12% of global anthropogenic emissions, contributing around 16 GtCO₂e in 2020 and projected to climb to 30 GtCO₂e by 2050. This sector stands at a critical crossroads, being both the largest vulnerability to climate change and the second largest contributor to GHG emissions, yet it remains uniquely positioned to drive both adaptation and mitigation. By integrating innovative sustainable practices Agri-Net Zero can transform farmlands into effective carbon sinks, thereby restoring the natural carbon cycle and enhancing soil health. Studies suggest that with the implementation of these



measures, potential CO₂ reductions in agriculture could range from 0.21 to 2.0 GtCO₂e per year under various scenarios—gains that are critical for limiting global warming to below 2 °C by 2100. Moreover, as population growth and changing dietary preferences in developing economies drive up emissions further, agriculture’s role in climate mitigation becomes even more urgent. With approximately 80% of countries incorporating agriculture into their mitigation targets and 64% including it in adaptation strategies via Nationally Determined Contributions, the Agri-Net Zero approach not only aligns with global climate objectives but also offers tangible benefits for corporates. It provides measurable progress on sustainability, mitigates supply chain risks for industries reliant on agricultural inputs, and supports innovation that can lead to improved resource efficiency and long-term financial benefits. In essence, by simultaneously reducing emissions from crop and livestock production, enhancing carbon sequestration, and restoring ecological balance, Agri-Net Zero delivers a comprehensive, scalable, and economically viable strategy that positions corporations as key drivers of climate action while securing food and livelihood security in an increasingly climate-uncertain world.

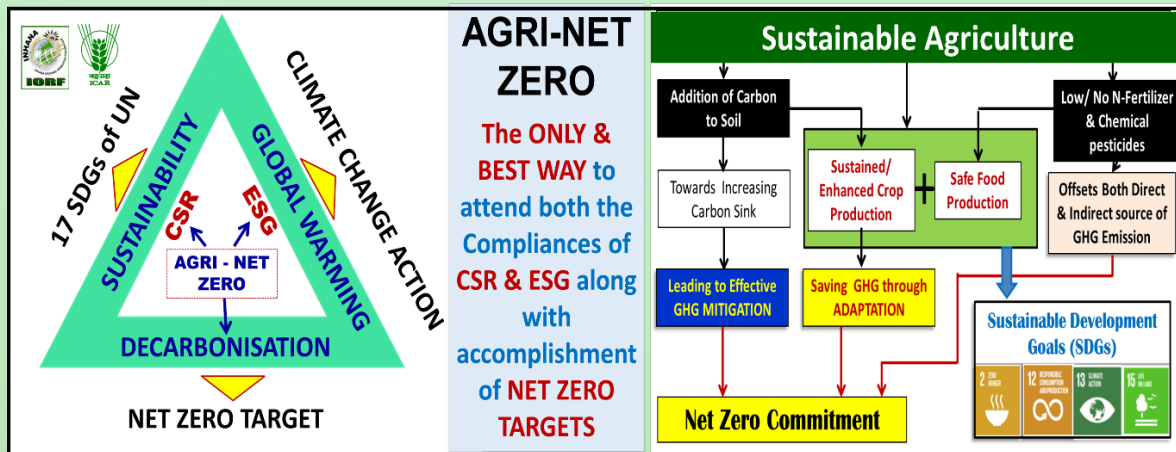


Fig 1 : Sustainable Agriculture can at a time attend the Net Zero Commitment & Sustainable Development Goals (SDGs)

Understanding Net Zero and Its Significance

The net zero concept represents a fundamental target in climate science and policy. It defines the state in which human-caused greenhouse gas (GHG) emissions are balanced by an equivalent amount removed from the atmosphere, effectively resulting in zero net emissions over multi-decadal timescales (IPCC, 2021). In essence, achieving net zero requires that every unit of CO₂ and other GHGs released by human activities is counterbalanced by removals through natural or engineered carbon sinks—such as forests, soil sequestration, or carbon capture and storage (CCS) technologies. This balance is critical because cumulative CO₂ emissions directly determine the extent of global warming. To keep warming within the 1.5°C threshold—an objective central to the Paris Agreement—the global carbon budget is estimated to be between 400 and 800 GtCO₂, implying that emissions must peak by 2030 and reach net zero by around 2050. Delays in reducing emissions not only erode the remaining carbon budget but also risk locking in long-term warming due to the persistent effect of CO₂ in the atmosphere. Reaching net zero is both a scientific necessity and a moral imperative. Stabilizing global temperatures depends on halting the net addition of CO₂, while also addressing other potent, albeit shorter-lived, greenhouse gases like methane and nitrous oxide. The concept extends beyond a mere numerical target; it offers a comprehensive framework that demands aggressive, front-loaded emission reductions combined with rigorously verified removal strategies. A credible net-zero strategy is underpinned by several scientifically grounded attributes that ensure environmental integrity, equity, and effective climate action. First, emission reductions must be front-loaded, with immediate and substantial cuts to maximize the likelihood of limiting global warming to 1.5°C. Second, a comprehensive approach is required, addressing all emission sources, including those from hard-to-abate sectors such as heavy industry and agriculture. Third, reliance on carbon dioxide removal should be approached with caution, ensuring it does not detract from direct emission reduction efforts. Fourth, carbon offsets must be subject to stringent regulation to guarantee their environmental and social integrity, preventing misuse and ensuring real climate benefits. Fifth, the transition to net zero must be equitable, recognizing different national circumstances and providing necessary support to developing countries. Sixth, net-zero plans should align with broader socio-ecological objectives by integrating biodiversity conservation and sustainable development goals. Lastly, pursuing new economic opportunities through innovation and investment in clean technologies can drive sustainable growth and job creation. Together, these attributes form a robust framework for achieving net-zero emissions in a manner that is scientifically sound, socially just, and economically beneficial.



In summary, the scientific significance of net zero lies in its direct link to the global carbon budget and temperature stabilization. However, its practical implementation is a complex, multi-faceted process that bridges technological innovation, policy reform, and international cooperation. Adhering to this framework—with its emphasis on immediate, decisive action and robust verification—offers the most promising pathway to mitigate climate change and secure a sustainable future for all.

Agriculture's Dual Challenge of Sustainability and Climate Action

Agriculture occupies a central role in the global economy and environmental sustainability, underpinning human existence not only through its production of food but also by sustaining countless livelihoods. For example, in countries like India, roughly 60% of the population depends directly on agriculture, with about 80% of these individuals being small and marginal farmers (FAO, 2021a). This heavy dependency highlights both the vulnerability of the sector and its critical influence on driving equitable and sustainable development.

Unlike other sectors characterized by high emissions—such as energy, transport, or industry—agriculture's long-term sustainability is inherently linked to achieving net zero emissions. While many sectors can transition to cleaner technologies or switch energy sources without radically changing their operational models, agriculture relies directly on ecological stability, predictable weather patterns, and the overall integrity of natural systems (IPCC, 2023). Climate change imperils these essential foundations by increasing temperatures, altering precipitation patterns, intensifying extreme weather events, and facilitating the spread of pests and diseases. These threats not only jeopardize agricultural productivity but also intensify risks to global food security, making the pursuit of net zero a matter of survival rather than a mere environmental obligation.

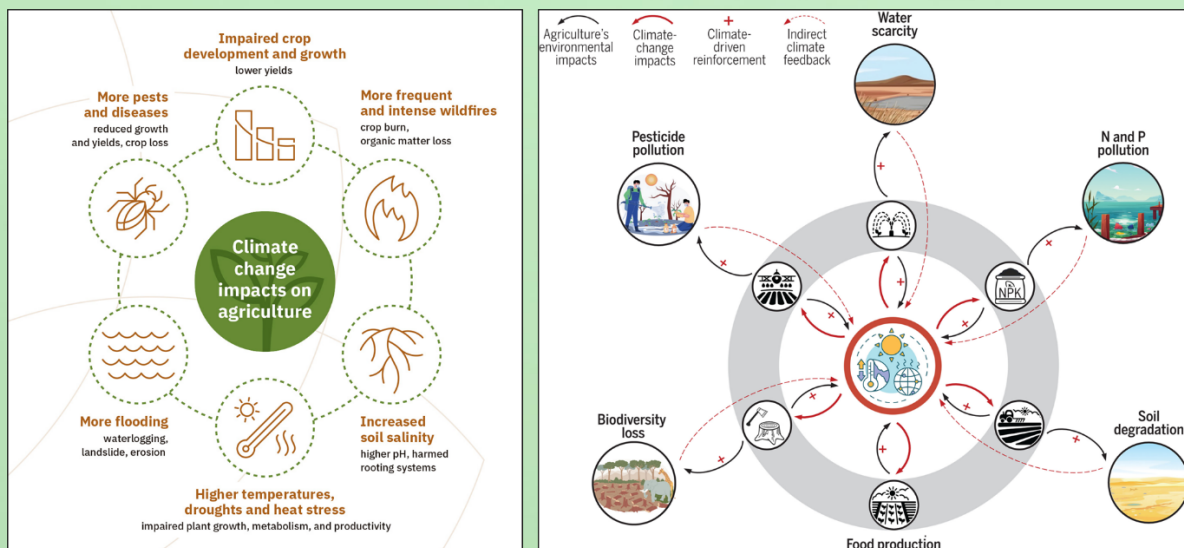


Fig.2: Agriculture's Dual Impact: Driving and Enduring the Consequences of Climate Change

Agricultural sustainability is also integral to achieving multiple Sustainable Development Goals (SDGs) such as Zero Hunger (SDG 2), Good Health and Well-being (SDG 3), Responsible Consumption and Production (SDG 12), Climate Action (SDG 13), and Life on Land (SDG 15) (United Nations, 2015). The sector now faces a dual challenge: feeding a growing global population—whose demand is projected to push food production up by approximately 50% by 2050 (FAO, 2017)—while simultaneously curbing its environmental impact. This tension is heightened in regions dominated by smallholder farming, where unsustainable practices have already emerged in agriculturally intensive and ecologically fragile areas.

Agriculture is uniquely positioned in the climate discourse; it is both a significant contributor to global greenhouse gas (GHG) emissions and one of the most vulnerable sectors to climate impacts. The sector is estimated to account for roughly 25–30% of global GHG emissions, primarily due to methane (CH₄) from enteric fermentation and rice paddies, nitrous oxide (N₂O) from synthetic fertilizer and manure applications, and carbon dioxide (CO₂) resulting from deforestation and land-use changes (IPCC, 2019). Moreover, the overuse of chemical inputs and extensive land conversion not only amplify emissions but also degrade ecosystems, reducing their capacity to act as natural carbon sinks (FAO, 2021). In India, for instance, agricultural activities contribute around 47% of total CH₄ and 80% of N₂O emissions, mostly from enteric fermentation, rice cultivation, and fertilizer use (MoEFCC, 2021; IPCC, 2019). These realities make it imperative to reform the sector—ensuring that the transition towards sustainable practices like climate-smart agriculture, agroecological methods, and improved resource management is supported by robust policy frameworks, financial investments, and international cooperation.

A promising aspect of agricultural ecosystems is their potential to mitigate climate change through soil carbon sequestration, with estimates suggesting that these systems could store up to 1 billion metric tons of carbon per



year—offsetting nearly 10% of global annual GHG emissions (Lal, 2020). However, this potential remains largely untapped due to the current lack of regenerative agricultural frameworks and the insufficient integration of carbon sequestration practices.

In summary, agriculture stands at a critical crossroads. It must navigate the dual imperative of meeting increasing food demands while drastically reducing its environmental footprint. The sector's decarbonization is not only a vital contribution to global climate goals but also a necessary path for its own longevity. By adopting deeply integrated strategies that encompass emission reductions, ecosystem restoration, and resilience-building, agriculture can pave the way for a sustainable future that concurrently addresses climate change and socio-economic development.

From Source to Sink: Repositioning Soil in the Climate Change Equation

Soil represents one of the largest natural carbon sinks on Earth, capable of storing more carbon than the atmosphere and terrestrial vegetation combined (Lal, 2004). This immense sequestration potential positions agriculture at the forefront of climate mitigation strategies, particularly in the context of achieving net zero. Agricultural soils, when managed sustainably, can absorb significant amounts of atmospheric carbon dioxide (CO₂) through processes such as enhanced organic matter input, cover cropping, conservation tillage, and agroforestry. However, conventional agricultural practices—characterized by intensive tillage, monocropping, and overuse of chemical inputs—have historically led to widespread soil degradation and carbon loss (IPCC, 2019). Transitioning to regenerative and climate-smart agricultural systems not only reduces ongoing emissions but also restores the soil's natural capacity to function as a long-term carbon sink. In this way, agricultural net zero initiatives go beyond short-term abatement; they contribute directly to the long-term stabilization of the climate system by embedding carbon back into terrestrial ecosystems. This dual functionality—emissions reduction and carbon sequestration—makes soil-centered agricultural strategies uniquely aligned with the IPCC's dual imperatives: curbing near-term warming and ensuring long-term climate resilience (IPCC, 2023). Hence, any credible pathway to net zero must prioritize agriculture not merely as an emitter to manage, but as a natural ally in climate restoration.

The IPCC Perspective: Positioning Agri-Net Zero within Net Zero Compliance Frameworks

The Intergovernmental Panel on Climate Change (IPCC) provides a foundational framework for achieving net zero emissions, emphasizing two core principles that are directly relevant to agriculture-based climate strategies. The first guideline identifies the need for an "entry point into longer-term emissions-reducing activities," stressing that any credible net zero compliance program must begin with immediate and significant reductions in absolute greenhouse gas (GHG) emissions—both direct and indirect (IPCC, 2023). This entry point is not merely about meeting near-term benchmarks but about initiating a robust and sustained trajectory of decarbonization. It necessitates the early adoption of mitigation strategies, investment in low-emission technologies, and structural shifts in policy and practice that drive continuous emission reductions over time. Agriculture offers a particularly strategic entry point in this context, given its potential not only to reduce emissions but also to serve as a large-scale carbon sink. Through integrated approaches that enhance both mitigation and sequestration, Agri-Net Zero emerges as a vital mechanism for aligning agricultural practices with net zero goals.

The second IPCC guideline focuses on the treatment of "impossible-to-abate" emissions—residual emissions from sectors where complete decarbonization is currently unfeasible due to technological or systemic limitations. In agriculture, this primarily includes methane (CH₄) emissions from enteric fermentation and nitrous oxide (N₂O) from fertilizer application and manure management, for which no zero-emission substitutes currently exist (IPCC, 2022). For these emissions, the IPCC framework mandates that carbon removals—whether through afforestation, soil carbon sequestration, or other nature-based solutions—be deployed judiciously and only as a compensatory measure for truly unavoidable emissions. Agri-Net Zero responds to this imperative by offering a responsible, science-aligned pathway that combines source-level emission abatement with landscape-scale sequestration. It prioritizes emissions reductions at the production level while leveraging the inherent carbon capture capacity of agricultural ecosystems. In doing so, it advances a balanced and ethically grounded net zero approach that neither delays mitigation efforts nor over-relies on offsets, but instead positions agriculture as a cornerstone in the global climate solution.

Emission Reduction Over Offsetting: Agriculture's Unique Decarbonization Advantage

In the pursuit of net zero, the global emphasis must shift from carbon offsetting mechanisms to actual emission reductions at the source. While many sectors rely heavily on offsetting—through afforestation, carbon trading, or external sequestration projects—to balance their emissions, these approaches often delay systemic change and create accountability gaps (IPCC, 2023). In contrast, agriculture stands out as a sector where internal emission reduction is not only viable but indispensable. Unlike sectors such as aviation or heavy industry, where decarbonization technologies remain limited or cost-prohibitive, agriculture offers a suite of nature-based and management-driven solutions that enable real-time reductions in greenhouse gas emissions (FAO, 2021c; Smith et al., 2019). These include practices such as improved livestock feeding strategies, reduced nitrogen fertilizer use, agroforestry, and enhanced soil carbon management—all of which lower emissions at the source while delivering co-benefits for biodiversity, soil health, and resilience. Therefore, agriculture represents a rare opportunity: a sector



capable of delivering authentic emission reductions without over reliance on external offsets. As climate accountability becomes more stringent, the credibility of agriculture's mitigation pathway—grounded in real emission reductions—positions it as a leading contributor to global net zero efforts.

Agricultural Net Zero: The Best Model for Achieving Climate and Sustainability Goals

Among the diverse pathways to net zero emissions, the agricultural net zero model offers the most holistic and achievable approach. Agriculture stands as the only sector where emission reductions, carbon sequestration, and sustainable land management practices can be integrated in a way that enhances food security, ecosystem services, and resilience to climate impacts. Unlike energy or industrial sectors that rely heavily on technological innovations or external carbon offsets, agriculture's capacity to both reduce emissions and actively cycle carbon back into the soil makes it an inherently productive, scalable, and natural carbon sink (IPCC, 2023; Lal, 2020). Regenerative agriculture, agroforestry, soil carbon management, and sustainable livestock systems provide a multi-pronged strategy that not only mitigates climate change but also regenerates vital ecological functions, such as soil health, biodiversity, and water management (FAO, 2021). Moreover, agriculture's direct relationship with food production ensures that net zero in agriculture is not an isolated goal but one deeply tied to global sustainable development targets—making it the most impactful and comprehensive net zero pathway. This synergy of climate action and food security makes agricultural net zero the best model for a sustainable future, combining environmental, social, and economic resilience in a single framework.

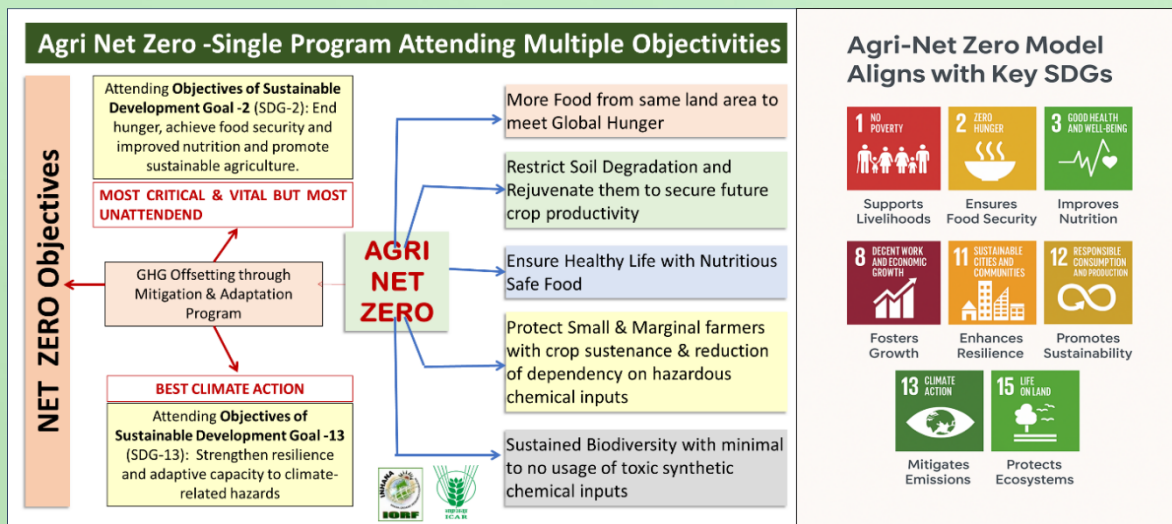


Fig.3: AGRI NET ZERO vital link in between Net Zero Objectives and Environmental & Social Goals

Agricultural Net Zero: The Only Pathway to Reintegration of Atmospheric Carbon

Among all major sectors, agriculture uniquely holds the potential not only to reduce emissions but to actively channel atmospheric carbon back into the terrestrial carbon cycle through biological processes. While sectors such as energy, transport, and industry focus primarily on reducing or avoiding emissions, agriculture—via soil carbon sequestration, biomass growth, and ecosystem restoration—can capture and utilize atmospheric CO₂ in ways that are intrinsic to its production system (IPCC, 2019a). Practices like agroforestry, regenerative tillage, organic matter incorporation, and pasture management serve as natural carbon drawdown mechanisms that reintegrate carbon into living systems and soils, where it contributes to soil fertility, water retention, and biodiversity (Lal, 2020). This makes agriculture the only sector where net zero is not solely an endpoint of balance, but also a functional mechanism for restoring the carbon cycle. Unlike engineered carbon capture, agricultural sequestration is inherently productive, cost-effective, and scalable—representing not just climate mitigation, but carbon utilization for long-term ecosystem and food system resilience. Achieving net zero in agriculture, therefore, offers the clearest pathway to align carbon removal with global sustainability and regenerative land use objectives.

Agri Net Zero: A Socially Inclusive Pathway for Livelihood Security and Rural Transformation

The Agri Net Zero can hold transformative potential not only for environmental sustainability but also for social equity and rural livelihoods. As agriculture continues to be the primary source of income for a majority of the rural population—particularly small and marginal farmers—transitioning to low-carbon, sustainable practices presents a unique opportunity for inclusive development (FAO, 2021). By promoting low-input farming systems that reduce dependency on expensive chemical fertilizers and pesticides, Agri Net Zero directly addresses rural indebtedness and economic vulnerability (World Bank, 2020). Moreover, the integration of regenerative and carbon-smart practices facilitates farmer participation in emerging carbon markets through carbon farming initiatives, creating new income streams via carbon credits (IPCC, 2023; Verra, 2022). In addition, the Agri Net Zero framework aligns



with national and global food security goals by improving soil fertility, ensuring year-round productivity, and enhancing the nutritional value of food outputs. These systemic improvements contribute to SDG-2 (Zero Hunger), SDG-1 (No Poverty), and SDG-10 (Reduced Inequalities), among others. Furthermore, empowering farmers with climate-smart knowledge and market access strengthens community resilience and fosters rural development through decentralized, sustainable economies. Thus, beyond emissions reduction, the Agri Net Zero model emerges as a powerful socio-economic lever for driving rural transformation, food system resilience, and equitable climate action.

Agri Net Zero: Pioneering Sustainable Agriculture for a Resilient, Net Zero Future

Agri Net Zero is the optimal net zero strategy because it addresses the twin imperatives of limiting global warming through direct emissions reduction and mitigating climate change by transforming sectors that are both major emitters and potential carbon sinks. The core net zero objectives emphasize reducing greenhouse gas (GHG) emissions from human activities and mitigating the broader impacts of climate change; however, since corporations cannot realistically achieve a 100% reduction across Scope 1, 2, and 3 emissions, they must rely on advanced technological interventions and strategic offsetting measures. Agri Net Zero leverages this approach by focusing on agriculture—a sector that, while responsible for substantial GHG outputs such as nitrous oxide and methane, also possesses the unique capacity for carbon sequestration through improved soil health, regenerative practices, and precision farming. Guided by IPCC recommendations, the strategy prioritizes decarbonization in areas where emissions are particularly challenging to abate and emphasizes long-term, sustainable measures that extend beyond short-term fixes. Moreover, Agri Net Zero not only enhances crop sustainability by reducing the reliance on chemical inputs like nitrate fertilizers but also integrates circular economy principles by converting agricultural waste into resources, effectively transforming the sector into a carbon-negative system. This approach is especially critical given that a significant portion of the global population—up to 70% in countries like India—relies on agriculture for their livelihoods, with a large percentage of small, resource-poor farmers at risk from the impacts of climate change. By aligning with Sustainable Development Goals such as SDG 13 (climate action) and SDG 2 (zero hunger), Agri Net Zero ensures that corporate efforts toward emissions reduction are simultaneously advancing social, economic, and environmental sustainability. In essence, Agri Net Zero integrates robust technological solutions, long-term ecological benefits, and comprehensive social responsibility, making it the most viable and impactful approach for achieving a resilient net zero future.

Practical Demonstration of Agri-Net zero Model- Clean Food Net Zero (CFNZ) Program under IBM-IORF Sustainability Project (2021-22 to 2023-24)

The IBM-IORF Sustainability Project (2021–22 to 2023–24) has successfully demonstrated a breakthrough Agri-Net Zero model through its Clean Food Net Zero (CFNZ) Program, which integrates nature receptive agronomic innovations for sustainable, pesticide-free, and carbon-negative food production. Developed by the Inhana Organic Research Foundation on the proven ECCES Model, the CFNZ model leverages IRF Technology for Plant Health Management—providing 360° support from seed treatment to production and enhancing crop productivity by up to 20%—in tandem with Novcom Composting Technology for Soil Health Management. Comprehensive field evaluations have shown that this integrated approach not only reduces the cost of cultivation through optimized resource utilization and enhanced plant immunity but also significantly improves energy efficiency, with recorded gains upto 432% higher crop productivity per unit energy investment and a 57% energy transition.

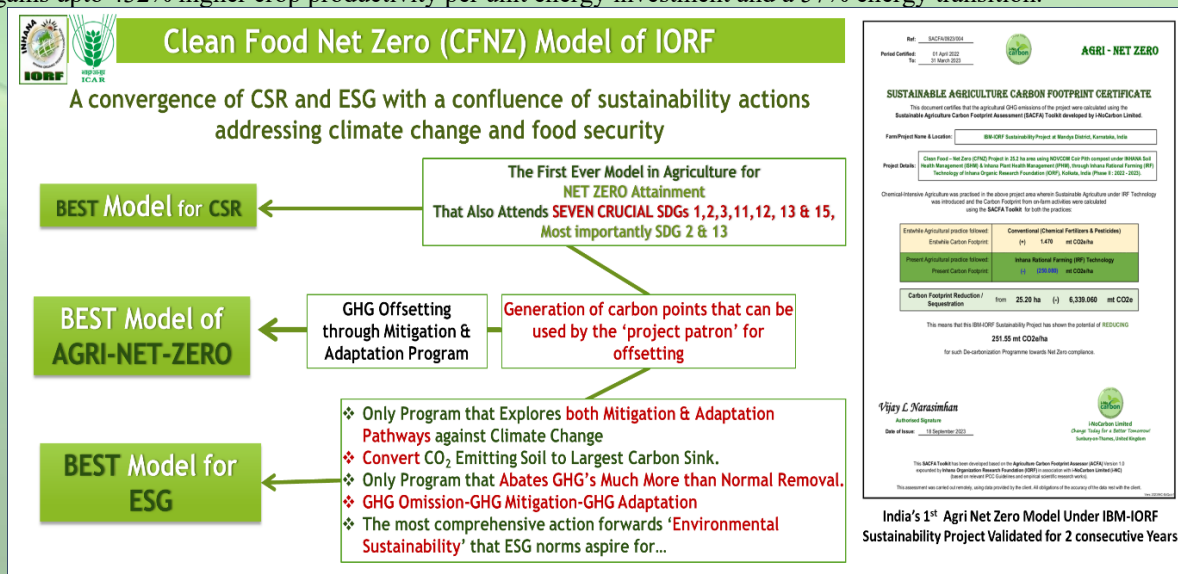


Fig 4 : The Clean Food Net Zero (CFNZ) program, under the IBM-IORF Sustainability Project, effectively showcased the extensive, multifaceted impact of the Agri-Net Zero model.



A pivotal innovation within the program is its “waste-to-wealth” strategy, wherein the conversion of coir pith—a byproduct of the coconut industry into Safe–Stable–Mature Compost can mitigate up to 250 MT CO₂e per hectare by transforming a high-methane-emitting waste into a valuable organic manure, thereby reducing methane emissions and enhancing soil organic carbon sequestration. Demonstrations on model farms in West Bengal and Karnataka revealed that a 100-hectare application of the CFNZ model can potentially offset between 24,833 and over 50,000 MT CO₂e per year. Furthermore, the project has developed unique sustainability tools viz. the Soil Health Proximity Model, the Pesticide Pollution Index, and the Carbon Footprint Indices—that provide quantitative assessments of soil quality, pesticide risk, and crop sustainability. By aligning with multiple Sustainable Development Goals (notably SDG 2 and SDG 13) and complementary government initiatives such as the Agriculture Accelerator Fund, GOBARDhan etc, the CFNZ model paves the way for transforming conventional, GHG-emitting agricultural practices into resource-independent, GHG sink systems, with scalable potential to register carbon abatement and to significantly contribute to corporate, net zero, and sustainability compliance in the agricultural sector.

Conclusion

Agri-Net Zero stands out as the best model for Corporate net zero compliance by seamlessly integrating direct emission reductions with nature-based carbon sequestration. This approach transforms agricultural landscapes—one of the most significant sources of greenhouse gas emissions—into dynamic carbon sinks, while concurrently enhancing soil health, ensuring food security, and mitigating supply chain risks. Unlike traditional offsetting methods that often delay systemic change, Agri-Net Zero implements regenerative practices such as agroforestry, sustainable livestock management, and advanced soil techniques that drive immediate and measurable decarbonization. Aligned with rigorous IPCC guidelines, this model tackles both direct emissions and “impossible-to-abate” emissions like methane and nitrous oxide through innovative, sustainable strategies. The practical success of initiatives like the Clean Food Net Zero Program under the IBM-IORF Sustainability Project further demonstrates its scalability, economic viability, and the substantial environmental co-benefits it offers—ranging from improved energy efficiency to significant cost reductions in resource utilization. By directly addressing emission reductions at the source and securing sustainable livelihoods for communities, Agri-Net Zero not only helps corporations meet their ambitious net zero targets but also reinforces their overall ESG commitments. In an era where rapid climate action is essential, Agri-Net Zero provides a transformative and comprehensive pathway that uniquely positions agriculture as a cornerstone in the global pursuit of climate stability and sustainability.

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