Executive Summary

Rethinking Sustainability

Life-centric agriculture in a techno-centric world

A review and gene-editing case study

A BIGGER CONVERSATION

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Life-centric Agriculture in a Techno-centric World

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Rethinking Sustainability

"We in this generation, must come to terms with nature, and I think we're challenged as mankind has never been challenged before to prove our maturity and our mastery, not of nature, but of ourselves."

When Rachel Carson spoke these words, shortly after the publication of Silent Spring, there was still hope that humans could learn to take care of and "work with nature". Since that time, we have continued to wage a never-ending war on nature, seeing it as a problem to be solved, as a system to be gamed, as an organism to be manipulated and a marketplace from which to profit.

The growth agenda has become so quickly and deeply embedded in our day-to-day thinking and functioning that we have lost touch with the roots of truly sustainable thinking. It is entirely possible that there are people advocating for sustainable solutions today who have no awareness of the great thinkers and the vast canon of literature, built up over decades, laying the foundations for a philosophy of wholism and a sustainable world.

Whilst examining all this, we have become uncomfortably aware of how profoundly disconnected society and its leaders have become – in thought and endeavour – from the roots of wholistic sustainability

In the face of escalating climate change, biodiversity loss and social discontent, governments around the world are talking about how to incorporate sustainability concerns into policy and regulation.

As the concept of 'sustainability' has inched up the political agenda, the way we define it has become distorted and compromised. Today many of our ideas about sustainability – sometimes even those espoused by environmentalists – are more about political expediency, corporate interests and market creation. Too often it focuses on corporate reporting rather than production processes and is more centred on creating and sustaining 'green' markets and a 'green' economy rather than supporting and increasing ecosystem sustainability.

The proposal of this report is that this distorted concept of sustainability has demonstrably failed and needs to be radically rethought.

A sustainable agro-eco system

While our original intention was to look at agricultural sustainability – and in particular the sustainability claims of modern biotechnology – it quickly became clear that agricultural sustainability could not easily be separated from sustainability in the broader sense.

Sustainability in agriculture is fundamentally about finding ways for food production to be environmentally responsible, socially equitable and economically appropriate – goals that are inherently tied to a wider sustainability agenda.

Agriculture is inextricably linked to many of the key environmental, social and economic challenges that fall under the umbrella of sustainability. Agricultural practices have major impacts on natural resource use, greenhouse gas emissions, biodiversity, soil health, water quality and the livelihoods of farmers and rural communities.

In delving into all of this, it quickly became clear that while it is possible to examine specific sustainable agricultural practices, these first needed to be situated within the larger context of an integrated, systems-level approach that recognises the interdependencies between different sectors and domains.

Beyond a 'technocapitalist' vision

The rise of technology and the widespread emphasis on innovation in farming and the 'food system' provides a timely and unique context for revisiting the history of sustainable thinking. It allows for a reaffirmation of fundamental principles around sustainability in general, and within agriculture in particular.

Key takeaways

This report covers a lot of ground and aims to provide food for thought about current approaches to sustainability, particularly in agriculture.

- It examines sustainability broadly and in relation to agriculture, noting that there has been a significant shift from a values-based "life-centric" to a market-based "techno-centric" approach to sustainability in recent decades.
- This is driven by a technocapitalist perspective which focuses narrowly on science, technology and innovation as means of increasing productivity, creating new markets and fuelling economic growth, leading to overwhelming corporate control.
- Despite widespread use since the late 1960s, "sustainable" and "sustainability" remain poorly defined and contested. Triple bottom line concepts like sustainable intensification, net zero, nature-based solutions, and climate-smart agriculture ignore fundamental differences that exist around the compatibility of economic growth, planetary boundaries and societal values.
- The failure to achieve the Sustainable Development Goals, alongside the increasing failure of the world to live within planetary boundaries, demonstrates how unsustainable and unfit for purpose a market/business/economy-centric approach (including "green growth") to sustainability is.
- We propose a shift to a life-centric approach to sustainability linked to a core philosophy that sustainability must, first and foremost, sustain life.
- We identify four key pillars that support this approach – Boundaries and limits; A duty of care; Sufficiency; and Equity and democracy.
- These pillars align with decades of sustainability thinking and provide a framework for: operating within clear ecological boundaries; addressing social and democratic aspects of sustainability; challenging existing power structures and economic models; promoting diversity in agricultural practices and decision-making and prioritising resilience and adaptability over narrow efficiency metrics.
- As it is fundamental to life and wellbeing, we have based much of our considerations of sustainability on the perspective of agriculture and the food system. We present several criteria and examples for how this might work including an appendix of positive actions which fit within these pillars.
- The path to sustainability can involve both 'end-state' goals and incremental processes. In recent years, we have increasingly adopted incremental and limited fixes as a means of transitioning to a sustainable end-state. But incremental sustainability efforts, which can seem like painless transitions, may end up becoming unhelpful lock-ins. The risks and benefits of incremental systems and processes, therefore, need to be carefully considered before deployment in the agriculture and the wider environment.
- As a case study exercise, we examined gene editing against our life-centric perspective and framework for sustainability and found it to be incompatible. We judge it to be a limited and incremental intervention, rather than a whole-system approach to agriculture, and one that doesn't align with a life-centric, whole-system approach to sustainability.
- Our framework doesn't categorically rule out a role for some applications of gene editing as part of a transition or incremental pathway to sustainability. However, we considered its sustainability claims and found that transparent, independent evidence for the contribution it might make to a transition to life-centric sustainability is lacking.
- Examples of life-centric approaches to sustainability in agriculture already exist, including aspects of organic agriculture, community-supported agriculture, the agroecological movement, and La Via Campesina.
- We recognise the practical implementation and development of these pillars will take much work and there will be resistance from vested interests. Crucially, consensus would require a commitment to a multi-faceted approach, combining policy measures, economic incentives, education and community engagement.

Many of these are decades old and while these principles have been discussed before, their application to current issues like the use of gene editing in agriculture, or indeed wider nature, brings fresh relevance.

Gene editing – also known as precision-breeding (PBOs), bioengineering and new genetic technologies (NGTs) – is attracting increasing attention in the context of sustainable innovation in agriculture.

Developers and lobbyists all over the world are actively promoting genetic technologies as an economic and environmental win-win, with the potential to increase yield, improve resilience to increasingly extreme weather conditions or reduce the need for inputs such as pesticides or fungicides, whilst at the same time driving new markets and new economies.

The extent of these claims is breathtaking. The audacity of the aspiration is enough to justify scepticism, even before the paucity of evidence backing up the claims and the patchy track record of genetic engineering in farming and food are considered.

A 2019 UK government policy paper entitled Regulation for the Fourth Industrial Revolution, described "a fusion of technologies – such as artificial intelligence, gene editing and advanced robotics – that is blurring the lines between the physical, digital and biological worlds".

This is a rather anodyne way of expressing a fundamental change in human intervention in the natural world, in ecosystems and the make-up of the building blocks of life. This approach doesn't so much blur the lines as obliterate them, along with all the protocols, procedures and regulations that flow from them.

Today technology-focussed markets – research, innovation, intellectual property and capital generation – are being given priority status over the myriad and diverse needs of farming and food. This new 'technocapitalism' is more than a 'blurring of the lines'. Whilst accepting that innovation can move us forward in positive ways, this view constitutes a profound challenge to farmers, conservationists, rural communities and the culture of growing food in a living ecosystem.

Technocapitalism, grounded in technology and science, is characterised by the convergence of advanced technology, capitalist market structures and an emphasis on technological innovation as the primary driver of economic and social change.

It seeks the disruption or deconstruction of natural, cultural, structural and regulatory boundaries, thereby challenging existing legal and ethical norms and frameworks. It operates through the commercialisation of knowledge by patents, monetised intellectual property and data capture. It smudges the boundaries between public and private spheres of interest and finance.

Whilst we are just on the cusp of such changes, the new reality being created by this new form of capitalism is likely to impact most aspects of human life and relationships including work, health, community and nature itself.

The speed with which technocapitalism has overtaken the sustainability agenda is dizzying, and the aggression with which a handful of corporate elites, and the politicians in their thrall, defend that position is overwhelming. These changes are nothing less than a fiat, enacted without democratic, public or critical debate.

Sustainability in agriculture is fundamentally about finding ways for food production to be environmentally responsible, socially equitable and economically appropriate – goals that are inherently tied to the wider sustainability agenda

Of course, society can advance through industry and technology – but not only through these things.

Society also advances through more sophisticated ethical frameworks and an expanded circle of moral consideration, which can lead to social and political reforms and progress in areas like human rights, animal welfare and environmental stewardship.

It advances through education and access to information, which in turn empowers critical thinking and informed decision-making, and through individual and collective spiritual and philosophical growth, an increased understanding of human psychology and through cultural and artistic expression.

This multi-dimensionalism is the essence of a functional, sustainable and resilient society and is necessary for society to advance at all.

In search of clarity

Whilst examining all this, we have become aware of how profoundly disconnected society and its leaders have become – in thought and endeavour – from the roots of wholistic sustainability.
This report attempts to address at least some of these things in a 'back to basics' way; starting with an overview of the various uses and definitions of the term 'sustainability'.

It considers the main barriers to change – or lock-ins – of the current industrial agricultural system and the emerging technocapitalist one and analyses the process of managing trade-offs in sustainability assessments. Both of these are crucial factors when designing a sustainable agricultural system.

It proposes four key pillars for a 'life-centric' approach to sustainability. **Boundaries and limits** recognises ecological constraints, as well as social and economic boundaries in rural communities, and commits to operating within these boundaries. **A duty of care** considers how to balance current needs with those of future generations, calling for precaution and foresight.

Sufficiency reduces and rebalances consumption so that everyone has what they need but no more. It is based on the idea that quality of life can be achieved through values other than consumption, such as social connections. **Equity and Democracy** ensures fair access to resources and inclusive decision-making processes, particularly when it comes to making difficult trade-off decisions while designing a sustainable food system.

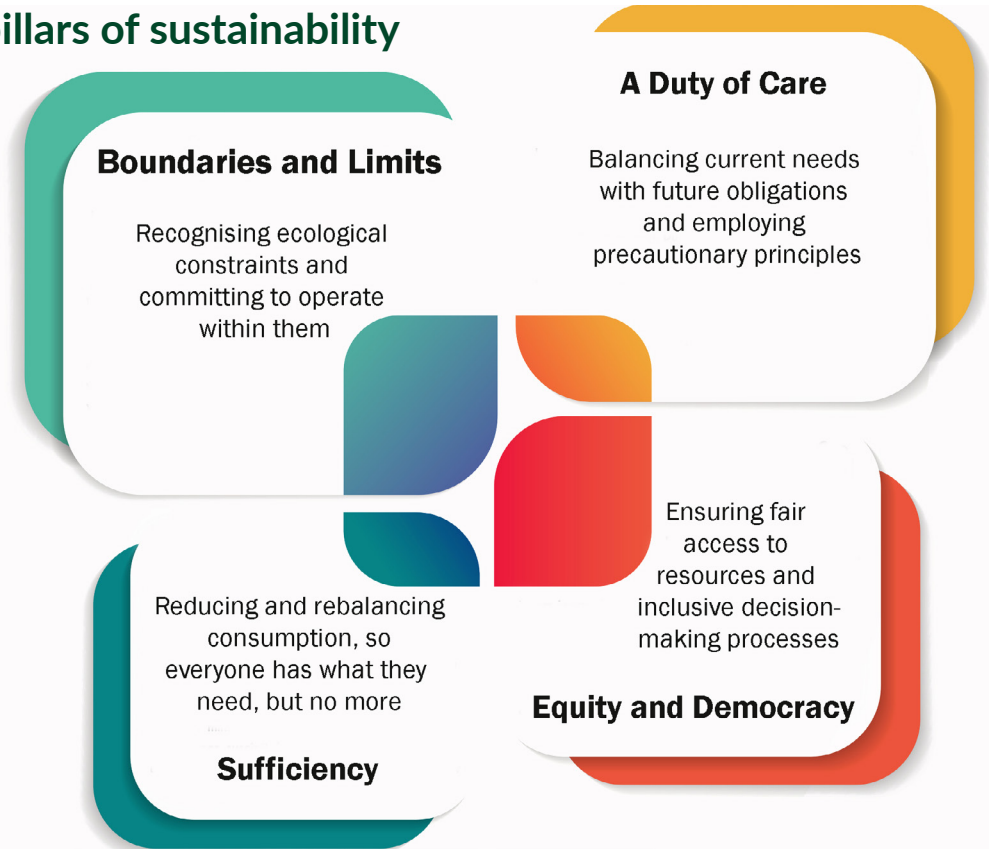
Our report applies these foundational principles to help policymakers guide the assessment of the sustainability of new technologies and to assist citizens in understanding and judging policies and policy-making.

Finally, our consideration of gene editing from the perspective of life-centric sustainability concludes that it is incompatible with wholistic sustainability, although some aspects might – in some limited circumstances – be helpful in a transitional or incremental role.

Opportunities as well as challenges

The framework set out in this report is our attempt to set out a transformative values-based vision of sustainability. We recognise the challenges in the practical implementation of these ideas, as well as the potential economic impacts and the need for widespread acceptance and adoption.

Our four pillars of sustainability



But we also recognise that we are not starting from scratch. Examples of values-based sustainability exist right now.

While organic agriculture is not perfect and needs developing, it is a working example of sustainable agriculture in action. Organic is a values-based system rooted in the principles of Health, Ecology, Fairness and Care and proven throughout the world. Community-supported agriculture (CSA), an increasingly popular model in many countries, embodies principles of equity and democracy by directly connecting consumers with local farmers.

The peasant and landworkers movements bring focus to social justice and equity in agriculture as well as to the many traditional agricultural practices, incorporated into indigenous farming systems, that incorporate principles of care, sufficiency and respect for natural boundaries.

The growing regenerative agriculture movement emphasises soil health, biodiversity and ecosystem services, aligning with the duty of care principle. In addition, the appendix to our report gives an idea of the kinds of positive actions that are being or can be taken, or would be appropriate, under each of our pillars of sustainability.

Taken together these represent a large scale and global commitment to values-based sustainability in agriculture in principle and in viable practice. Nevertheless, challenges remain including:

- Resistance from established agricultural industries
- Economic pressures and global market forces
- Lack of consensus on specific metrics and standards
- Varying capacities and resources across different regions
- Balancing short-term productivity with long-term sustainability

We believe these challenges can be overcome with:

- Strong policy frameworks at national and international levels
- Significant investment in research of a variety of farming practices and education
- Economic incentives and support for transition periods
- Collaboration between farmers, scientists, policymakers and citizens
- Adaptive management approaches to refine strategies over time

Implementing our suggestions would require sustained effort and resources, but they offer pathways to overcome the inertia that has hindered the adoption of sustainability principles thus far. The key is to create a multi-faceted approach that addresses the complex nature of sustainability challenges while building broad-based support for change.

Our aim is to open a discussion that is being increasingly side-lined and to address a widening gap in the discourse around sustainable agriculture and food systems, where technological solutions are often presented as ‘sustainable’ without sufficient consideration, or demonstration, of how they meet even the most basic principles of sustainability.