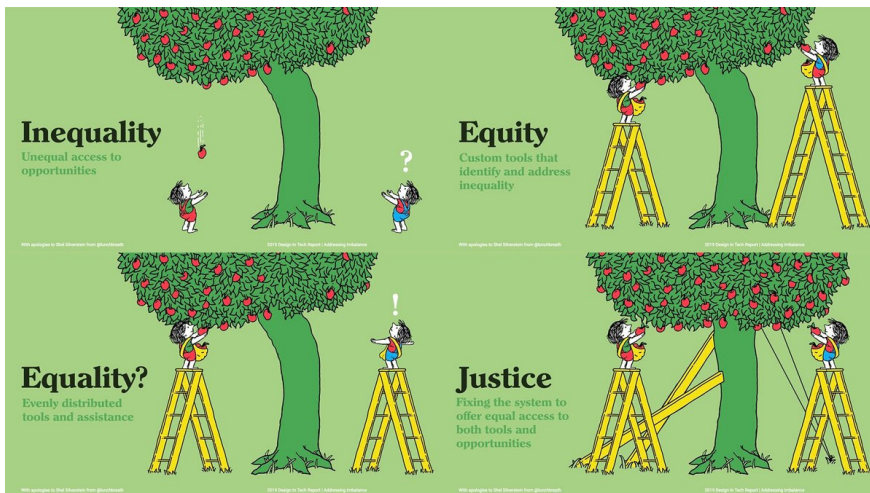


OPEN-SOURCE FOOD FOR ALL

Transforming Systems of Inequality That Allow Hunger To Persist Using AI & Collective Intelligence As A Solutions Approach To Food Security and Sovereignty

AI DISCUSSION PAPER PREPARED TO CATALYZE [THE HUNGER PROJECT](#)

Consulting Approach Provided By [UnderOneSky](#) (fka [SkyFarms.io](#)) Assisted by The Power of [AI](#) - With An Invitation For Contributions From Our Open-Source AgSphere, our partner [MultiScale Recipes](#), while also leveraging [Collective Intelligence](#) through private stakeholders and public food citizens, [Network Design](#) by [Panarchy](#), [Systems Mapping](#) and [True Cost Accounting](#)



OPENING STATEMENT

The Hunger Project is a global movement that aims to end hunger and poverty by empowering people to lead lives of self-reliance, dignity, and justice. The hunger project believes that hunger is not caused by a lack of food, but by a lack of effective systems that can ensure food security and nutrition for all.

Therefore, the hunger project seeks support to transform food systems in a holistic and systemic way, and has asked Under One Sky for some ideas for which the organisation utilizes nature inspired [network design](#) (through the lens of [biomimicry](#)) and systems thinking approach for the purpose of this discussion with AI to get deeper, broader, higher insights about this issue.

Commented [1]: Open-source innovation is outpacing outdated innovative models. The whole is greater than the sum of its parts.

Commented [2]: Who can grow and produce food? The most vulnerable and minorities would be best invested: women, youth, veterans, elders, impoverished, incarcerated, indigenous, people of color, LGBTQ+, addicts, mental health, how to integrate the 'teach someone to fish' mentality, as a tool of transformation?

Commented [3]: JEDI: Justice, Equity, Diversity, Inclusion

Commented [4]: FOUNDER JOAN HOLMES ADDITIONS: What's So document from which the strategy of what's missing can be applied. New Document in addendum to Discussion Paper

We need to address what is so now in our (HP) work to end hunger. We empower individuals at the community level to end their own hunger.

Has it, anywhere, been stated clearly or unequivocally that hunger is created and persists because of these systems of inequality? For the UN leadership to say again, let's meet the SDGs is not making a difference.

Come up with an expanded definition of hunger. If you look at the beginning paragraph of the discussion paper that is an example.

Once we say adequate and nutritious food, we will want to include obesity in our analysis.

How does the system of inequity create hunger and cause it to persist. What is the context, the space, the environment, the world view, etc. that we live with the allows these systems to continue unchallenged.

A definition of inequity at the very beginning of this section.

Look at the two most impactful systems: gender inequality and the food system. Analysis of each-- the source or the power of these two systems.

What orgs do we know working on this - Map It?

Commented [5]: the whole informing parts - centralized vs distributed and ownership vs access - separate vs interconnected - dependency vs. stewardship - monoculture vs biodiversity - Hierarchy vs. Holocracy

Commented [6]: Systems Innovation Network <https://www.systemsinnovation.network/>, and Meridian Mapping <https://foodsystemsmapping.org/map/>

Commented [7]: Let Thy Food Be Thy Medicine

strategies and solutions to solve human problems. **Systems thinking** is a way of understanding the complexity and interdependence of the factors that affect a system's behavior and outcomes. By applying these principles to food systems, the hunger project hopes to create more efficient, sustainable, and equitable food systems that can nourish all people and regenerate the planet.

In this discussion paper, we will explore some of the ideas, methods, technologies, and actions that could be involved in transforming food systems for a world without hunger. We will also identify some of the challenges and opportunities that we may encounter in this process. We hope that this paper will inspire and inform the board and founder of the hunger project, as well as other stakeholders and partners, to join us in this vision and mission.

Summary:

In this discussion paper, we will discuss some of the aspects and perspectives of food system transformation for a world without hunger. Covering topics such as:

- The current system of inequity that causes hunger and how it affects food production and consumption, land stewardship, and human rights.
- The new or hidden ways that have not come to light yet that can give us a better way to relate to this system and create a possibility of transformation toward a system of equity and opportunity.
- The types of wills, incentives, mindsets, or collective consciousnesses that must be involved or are required to demonstrate a tipping point in order to make this shift.
- The findings, key takeaways, and suggestions for action from the UN Food Systems Summit 2021, of which SkyFarms was part of.
- The elements that are required for a successful food for all type of food growth for a local system that might be demonstrated on a smaller scale, then replicated and turned into a cascade that permeates the global system.
- The role and potential of AgTech and CEA in creating more efficient and sustainable food systems locally or in greenhouses or biospheres.
- The importance of composting and making soil, collecting water and conserving it, and using food waste in biogas or energy for creating circular food systems.

We have also shared some further insights that we may have missed or overlooked in our discussion, such as:

- The need for a human rights-based approach that recognizes the right to food as a fundamental and universal right for all people.

Commented [8]: NEED TO INCLUDE REGEN AG, LAND STEWARDSHIP, PERMACULTURE, AGTECH

narratives, norms, and values that shape our relationship with food and nature.

- The need for a systemic change that addresses the root causes and structural drivers of hunger and malnutrition.

We hope that this discussion paper will provided you with some useful information and inspiration for your consultation for the hunger project. We invite you to share your feedback, questions, or suggestions with us.

Together, we can grow for it.

Find a proposed declaration in the **CLOSING STATEMENT** that could be adopted by any organization, including the UN, [here](#).

****See appendix for resources [available here](#)****

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As we shift from ending hunger to a world without hunger, can you help me come up with a comprehensive consultation for the hunger project regarding ideation around the systems of inequality that cause hunger and has it persist? Why don't we first start with defining the current system of inequity and what that is? Or do you have a better place to unpack this topic for the founder and the board members of this organization?

ChatGPT 4 (AI)

I think it is a good idea to start with defining the current system of inequity and how it affects hunger. According to the web search results, the system of inequity is a complex web of interconnected issues that create and sustain hunger and malnutrition in the world. Some of these issues are:

- Poverty: Extreme poverty, lack of sufficient food, and hunger are inextricably linked. People living in poverty often lack the income, assets, or social protection to afford or access nutritious food. They may also face barriers to education, health care, or other services that could improve their well-being and resilience.
- Climate change: The climate crisis is driving hunger and malnutrition around the world. It affects food production, availability, quality, and prices. It also increases the frequency and intensity of natural disasters and conflicts that disrupt and destroy livelihoods for millions of people.

conflict zones. Conflict causes displacement, insecurity, violence, and human rights violations that prevent people from accessing food or growing their own. It also hampers humanitarian assistance and development efforts.

- **Gender discrimination:** Women and girls are disproportionately affected by hunger and malnutrition. They often have less access to land, credit, education, health care, or decision-making power than men. They also face greater risks of violence, exploitation, or abuse that undermine their health and dignity.
- **Weak government and health systems:** Hunger and malnutrition are not only caused by a lack of food, but also by a lack of effective policies and institutions that can ensure food security and nutrition for all. Weak government and health systems may fail to provide adequate public services, social protection, or governance that can address the root causes and consequences of hunger. They may also lack the capacity or accountability to respond to the needs and demands of their citizens.

These are some of the main factors that create and maintain the system of inequity that causes hunger. To tackle this system, we need to understand how power is exercised and challenged in different spaces and by different actors. We also need to identify the opportunities and strategies for change that can empower the most vulnerable and marginalized groups to claim their right to food.

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We can get to identifying those opportunities and strategies, as I have been part of the United Nations Food System Summit and we can reveal those findings later. First I would suggest we start with systems thinking. That requires understanding the core of any system – input and output of Energy, and how it is distributed across a network? Would you say that is correct?

ChatGPT 4 (AI)

I agree that systems thinking is a useful way to understand the complexity and interdependence of the factors that cause hunger. However, I would not say that input and output of energy and its distribution across a network are the core of any system. Systems thinking is not limited to physical or mechanical systems, but can also apply to social, ecological, biological, or cognitive systems. These systems may have different types of inputs and outputs, such as information, resources, values, or behaviors. They may also have different types of networks, such as relationships, interactions, feedback loops, or hierarchies. **Therefore, I**

adapts to its environment and context.

Under One Sky

Drawing from biomimicry, can you define systems that function harmoniously, or advantageously - perhaps they even produce more yield than they input?

ChatGPT 4 (AI)

Systems that function harmoniously or advantageously **are systems that achieve a balance between the needs and capacities of the different components, and that create positive outcomes for the whole system and its environment.**

Biomimicry can help us identify and emulate such systems by looking at how nature solves problems and optimizes resources. Here are some examples of biomimetic systems that function harmoniously or advantageously:

- The **Velcro** system is inspired by the way burrs from burdock plants attach to animal fur or human clothing using tiny hooks. The Velcro system consists of two strips of fabric, one with hooks and one with loops, that can be easily fastened or separated. This system is advantageous because it provides a strong and durable connection that can be reused many times, without requiring any glue, nails, or other materials.
- The **Pax Water** system is inspired by the way water flows in spirals in nature, such as in whirlpools, tornados, or seashells. The Pax Water system consists of a device that creates a spiral flow inside water tanks, improving the mixing and quality of the water. This system is advantageous because it reduces the energy consumption and the need for chemicals to treat the water.
- The **Eastgate Centre** building is inspired by the way termite dens regulate their temperature and ventilation using a network of tunnels and chimneys. The Eastgate Centre building consists of a passive cooling system that uses natural air flow and heat exchange to maintain a comfortable indoor climate. This system is advantageous because it saves up to 90% of energy costs compared to conventional air conditioning.

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How would the Entropy fit into systems thinking, or the idea of currency exchange?

ChatGPT 4 (AI)

Entropy is a concept that measures the disorder or randomness of a system. In systems thinking, entropy can be used to describe how much energy or information is available or lost in a system. For example, a system that has high entropy is more unpredictable and chaotic, and has less potential to do work or create order. A system that has low entropy is more stable and organized, and has more potential to do work or create order .

Currency exchange is a process that involves converting one currency into another, based on the exchange rate between them. In systems thinking, currency exchange can be seen as a part of a larger system of international trade and finance, which affects the economic and social well-being of different countries and regions. Currency exchange can also be influenced by various factors, such as supply and demand, inflation, interest rates, political stability, and speculation .

One possible way to connect entropy and currency exchange is to consider how the volatility or stability of exchange rates affects the efficiency or inefficiency of international transactions. For example, if the exchange rate between two currencies fluctuates unpredictably, this can increase the entropy of the system and create uncertainty and risk for the buyers and sellers. This can also reduce the amount of trade and investment that takes place, as well as the benefits that they generate.

On the other hand, if the exchange rate between two currencies remains relatively stable, this can decrease the entropy of the system and create confidence and trust for the buyers and sellers. This can also increase the amount of trade and investment that takes place, as well as the benefits that they generate .

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By currency, I mean it's truest definition - energy.

ChatGPT 4 (AI)

I see. You mean that energy is the fundamental unit of exchange in any system, and that it can be transformed from one form to another, such as from chemical to mechanical, or from electrical to thermal. Energy is also conserved, meaning that it cannot be created or destroyed, only transferred or converted .

is the main molecule that stores and transfers energy in living cells . ATP is like a rechargeable battery that can be used to power various cellular processes, such as metabolism, movement, or signaling. ATP is produced by breaking down organic molecules, such as glucose, in a process called cellular respiration. ATP can also be used to synthesize other organic molecules, such as proteins or nucleic acids, in a process called biosynthesis. ATP is constantly being consumed and regenerated in the cell, maintaining a balance between energy supply and demand.

Under One Sky

In the current Petrochemical agricultural age, it takes 10 calories to produce 1 calorie. Factoring all the production and distribution players, water-energy-time, transportation, packaging, processing, storage, waste, what do you think can be done to understand more about this system of inequity? How can we begin to find more sovereignty in this system, and balance out these inputs to outputs ratios that are causing hunger to persist?

ChatGPT 4 (AI)

Thank you for your question. I think it is important to understand more about the system of inequity that causes hunger and how we can find more sovereignty in this system. Here are some of my thoughts:

- One way to understand more about the system of inequity is to analyze the energy inputs and outputs of different agricultural production systems and compare their environmental, social, and economic impacts. For example, we can use tools such as life cycle assessment (LCA) or energy return on investment (EROI) to measure the energy efficiency and sustainability of different food systems . We can also use indicators such as ecological footprint, carbon footprint, water footprint, or land use efficiency to assess the resource use and emissions of different food systems .
- Another way to understand more about the system of inequity is to examine the power relations and governance structures that shape the food system and influence the access and distribution of food and energy. For example, we can look at how policies, markets, trade agreements, subsidies, taxes, or regulations affect the production, consumption, and waste of food and energy . We can also look at how social factors such as gender, race, class, or culture affect the participation, representation, and empowerment of different actors in the food system .

agroecology and local food systems that are based on ecological principles, social justice, and human rights. Agroecology is a holistic approach that integrates ecological, social, economic, and cultural dimensions of food production and consumption. It aims to enhance biodiversity, soil health, water quality, climate resilience, food security, nutrition, and livelihoods . Local food systems are networks of producers, consumers, and intermediaries that are geographically close and share common values and interests. They aim to reduce the distance and dependence on external inputs and markets, increase the diversity and quality of food products, strengthen the relationships and trust among stakeholders, and foster community participation and empowerment .

- Another way to find more sovereignty in this system is to support innovation and collaboration among different actors in the food system that can create positive change. Innovation can involve developing new technologies, practices, policies, or institutions that can improve the efficiency, sustainability, or equity of food production and consumption. Collaboration can involve building partnerships, alliances, or networks among different actors that can share knowledge, resources, or experiences that can enhance the capacity, resilience, or influence of food system actors .

These are some possible ways to understand more about the system of inequity that causes hunger and how we can find more sovereignty in this system. I hope this helps you with your consultation for the hunger project.

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We currently produce enough food to feed 10B people on the planet, and yet almost 1B go hungry and malnutrition is also pervasive for billions more. Adding an extra layer to this system that allows hunger to persist, do you think there is a patriarchal mindset behind this system, or in another way of saying it, a system centered around separateness, ownership, linear (make-take-waste), ego mindset of bigger, faster, more myopicness, and/or short term thinking or vision? Can you help me find some blindspots or reasons why this systems continues to pervade our world?

ChatGPT 4 (AI)

Thank you for your question. I think it is possible that there is a patriarchal mindset behind the system that allows hunger to persist, or at least that the system is influenced by some of the characteristics that you mentioned, such as

some of my thoughts:

- **Separateness:** The system of hunger is based on a lack of connection and solidarity among people and nations. It creates a divide between the haves and the have-nots, the producers and the consumers, the rich and the poor, the powerful and the powerless. It also ignores the interdependence and interrelatedness of all living beings and ecosystems. This leads to exploitation, exclusion, inequality, and injustice .
- **Ownership:** The system of hunger is driven by a logic of privatization and commodification of food and natural resources. It prioritizes profit over people and planet. It concentrates land, water, seeds, technology, and markets in the hands of a few corporations and elites. It denies the rights and access of small-scale farmers, indigenous peoples, women, and other marginalized groups to food sovereignty and food security .
- **Linear thinking:** The system of hunger is based on a model of production and consumption that is unsustainable and wasteful. It relies on fossil fuels, chemical inputs, monocultures, and industrial agriculture. It generates greenhouse gas emissions, soil degradation, water pollution, biodiversity loss, and climate change. It also discards about one-third of the food produced globally, while millions of people go hungry .
- **Ego:** The system of hunger is influenced by a culture of individualism and competition that values self-interest over common good. It fosters greed, corruption, violence, and conflict. It also undermines the values of empathy, compassion, cooperation, and solidarity that are essential for addressing the root causes and consequences of hunger .
- **Short-term vision:** The system of hunger is shaped by a lack of foresight and planning for the future. It fails to address the long-term impacts and challenges of hunger on human health, well-being, development, and peace. It also neglects the needs and aspirations of future generations and their right to inherit a world free from hunger .

These are some possible blindspots or reasons why this system continues to pervade our world. I hope this helps you with your consultation for the hunger project.

Under One Sky

Are there new ways or hidden ways that haven't come to light yet that can give us a better way to relate to this system so there is a possibility of transformation toward a system of equity and opportunity and food for all?

ChatGPT 4 (AI)

Thank you for your question. I think there are some new or hidden ways that have not come to light yet that can give us a better way to relate to this system so there is a possibility of transformation toward a system of equity and opportunity and food for all. Here are some of my thoughts:

- One new way is to use ****digital technologies**** to improve the efficiency, transparency, and inclusiveness of food systems. Digital technologies can enable farmers to access information, markets, finance, and services that can improve their productivity, profitability, and resilience. They can also enable consumers to access more diverse, nutritious, and affordable food options, as well as information on the origin, quality, and impact of their food choices. Digital technologies can also facilitate data collection, analysis, and sharing that can inform policies, investments, and innovations that can support food system transformation .
- Another new way is to use ****circular economy principles**** to reduce food loss and waste, and to recover value from food by-products. Circular economy principles aim to design out waste and pollution, keep products and materials in use, and regenerate natural systems. They can help to optimize the use of resources, energy, and nutrients in food systems, and to create new opportunities for income generation, employment, and environmental protection .
- A hidden way is to use ****social movements**** to mobilize collective action and advocacy for food system change. Social movements are organized groups of people who share common goals, values, or interests, and who use various forms of action or expression to challenge or transform the status quo. They can help to raise awareness, build solidarity, influence policies, demand accountability, and create alternatives for food system transformation .

Under One Sky

Those are all great suggestions, can you break these down into key actions that both private and public sector could embed themselves in to be part of this transformation to a food for all paradigm?

ChatGPT 4 (AI)

Sure, I can break down the suggestions into key actions that both private and public sector could embed themselves in to be part of this transformation to a food for all paradigm. Here are some examples:

invest in practices and technologies that enhance soil health, biodiversity, and carbon sequestration, such as agroforestry, organic farming, or precision agriculture. The public sector could provide incentives and regulations that support regenerative agriculture and discourage harmful practices, such as deforestation, overgrazing, or excessive use of chemicals.

- To build stronger local and circular food systems, the private sector could develop more direct and transparent relationships with local producers and consumers, and adopt circular economy principles to reduce waste and reuse resources. The public sector could facilitate access to local markets and infrastructure, and promote education and awareness on the benefits of local and circular food systems .
- To give farmers a voice and support their planet-positive choices, the private sector could engage in inclusive and participatory dialogue with farmers and their organizations, and provide fair prices and contracts that reflect the true value of their products and services. The public sector could strengthen the rights and representation of farmers, especially smallholders, women, and indigenous peoples, and provide them with technical assistance, financial support, and social protection .
- To move from low cost to true cost, the private sector could adopt accounting methods that incorporate the environmental and social costs and benefits of their activities, and disclose them to their stakeholders. The public sector could reform subsidies and taxes that distort the true cost of food production and consumption, and implement policies that internalize externalities and reward positive outcomes .
- To foster radical collaboration, the private sector could join multi-stakeholder platforms and initiatives that aim to transform food systems in a holistic and systemic way. The public sector could provide leadership and coordination for such platforms and initiatives, and ensure that they are aligned with the Sustainable Development Goals (SDGs) and other global commitments .

Under One Sky

In 2021, the UN Food Systems summit was held, of which SkyFarms was part of, can you summarize what their findings were from the summit, the key takeaways, and suggestions for action? Were there any declarations made that give us context that goes beyond the content?

ChatGPT 4 (AI)

and suggestions for action from the UN Food Systems Summit 2021, of which SkyFarms was part of:

- The UN Food Systems Summit was convened by the UN Secretary-General from 23 to 24 September 2021 in recognition that transforming food systems provides one of the most powerful ways to realize the vision of the 2030 Agenda.
- The Summit brought together diverse actors and stakeholders from different sectors, regions, and backgrounds to share their perspectives, experiences, and solutions for food system transformation.
- The Summit resulted in several outcomes, such as:
 - The Secretary-General's Statement of Action, which outlined five key areas for making progress on the SDGs through food systems: (1) Nourish All People; (2) Boost Nature-based Solutions; (3) Advance Equitable Livelihoods, Decent Work and Empowered Communities; (4) Build Resilience to Vulnerabilities, Shocks and Stresses; and (5) Support Means of Implementation.
 - The Chair's Summary, which captured the main messages, commitments, and actions from the Summit's plenary sessions and thematic dialogues.
 - The National Pathways, which are voluntary plans submitted by 103 countries to transform their food systems in alignment with the Summit's vision and principles.
 - The Coalitions of Action, which are voluntary partnerships initiated by various actors and stakeholders to advance specific actions and solutions for food system transformation.
- Some of the key takeaways from the Summit are:
 - Food systems are complex and interconnected, requiring a holistic and systemic approach that considers the multiple dimensions and trade-offs of food production and consumption .
 - Food systems are diverse and context-specific, requiring a participatory and inclusive process that respects the rights, needs, and aspirations of different actors and stakeholders .
 - Food systems are dynamic and evolving, requiring a continuous and adaptive process that responds to the changing realities and challenges of food security and nutrition .
- Some of the suggestions for action from the Summit are:

technologies to improve the efficiency, sustainability, and equity of food systems .

- o To promote agroecology and local food systems that enhance biodiversity, soil health, water quality, climate resilience, food security, nutrition, and livelihoods .
- o To empower women, youth, indigenous peoples, smallholders, and other marginalized groups as key agents of change in food systems .
- o To adopt true cost accounting methods that incorporate the environmental and social costs and benefits of food production and consumption .
- o To foster radical collaboration among different actors and stakeholders at all levels to align their actions and commitments with the SDGs .

These are some of the findings, key takeaways, and suggestions for action from the UN Food Systems Summit 2021. I hope this helps you with your inquiry.

Under One Sky

It certainly does, thank you. What type of declaration or stand would you suggest we come up with that would help us face the current system of inequity, lack and scarcity, and support a foundation of actions that have been suggested?

ChatGPT 4 (AI)

You're welcome. I think a possible declaration or stand that you could come up with is something like this:

We, the members of Under One Sky & The Hunger Project (add other coalitions), declare that we are committed to transforming food systems for a world without hunger. We believe that food is a human right, a common good, and a source of life. We recognize that food systems are complex and interconnected, requiring a holistic and systemic approach that considers the multiple dimensions and trade-offs of food production and consumption. We acknowledge that food systems are diverse and context-specific, requiring a participatory and inclusive process that respects the rights, needs, and aspirations of different actors and stakeholders. We understand that food systems are dynamic and evolving, requiring a continuous and adaptive process

nutrition.

We pledge to take action to achieve the following goals:

- To harness the power of science, innovation, and digital technologies to improve the efficiency, sustainability, and equity of food systems.
- To promote agroecology and local food systems that enhance biodiversity, soil health, water quality, climate resilience, food security, nutrition, and livelihoods.
- To empower women, youth, indigenous peoples, smallholders, and other marginalized groups as key agents of change in food systems.
- To adopt true cost accounting methods that incorporate the environmental and social costs and benefits of food production and consumption.
- To foster radical collaboration among different actors and stakeholders at all levels to align their actions and commitments with the Sustainable Development Goals.

We invite you to join us in this declaration and stand for a world without hunger. Together, we can make a difference.

Commented [9]: THE DECLARATION TO SIGN

Under One Sky

Have we mentioned anything about food waste, or that most of our food is used to feed animals in our discussion yet?

ChatGPT 4 (AI)

Yes, we have mentioned something about food waste and animal feed in our discussion. You asked me to search the web for "food waste and animal feed statistics", and I showed you the results from different sources. According to one of the sources, around one-third of the world's food is lost to waste or 1.3 billion tons per year, and 30% of what's fed to livestock around the world today is either waste from food supply chains or by-products from growing and processing food. Another source said that in the US, about 10% of surplus food is already being sent to feed animals, most coming from manufacturing or grocery stores. These statistics show that food waste and animal feed are closely related issues that affect the sustainability and equity of food systems.

Commented [10]: FOOD WASTE STATS

Under One Sky

dependent on having our food produced for us but also that we are disconnected from nature, and in some ways each other, and therefore do not recognize our interconnection within this system?

ChatGPT 4 (AI)

I think that is a possible factor that affects our relationship with food and nature. Urbanization can create a physical and psychological distance between people and the sources of their food, as well as the environmental and social impacts of their food choices. This can lead to a loss of awareness, appreciation, and responsibility for the food system and its outcomes. Urbanization can also affect the social cohesion and sense of community among people, as they may have less opportunities or incentives to interact with their neighbors, share food, or participate in local food initiatives. Therefore, I think it is important to reconnect urban dwellers with nature and each other, and to foster a culture of food citizenship that values the interconnection and interdependence of all actors and stakeholders in the food system.

Commented [11]: Effects of Urbanizations on Food

Under One Sky

Could you help me identify the difference between the agrarian age and the current industrial age in terms of how food, land stewardship and hunger all shifted? It seems we produce a lot more food now but it never solved hunger? I wonder if more people were fed during the agrarian age that launched civilization as we know it.

ChatGPT 4 (AI)

Sure, I can help you identify the difference between the agrarian age and the current industrial age in terms of how food, land stewardship and hunger all shifted. Here are some of the main differences:

- **Food:** In the agrarian age, food was mainly produced by small-scale farmers who used traditional methods and tools, such as plows, hoes, and sickles. They cultivated crops and raised animals that were adapted to their local environment and climate. They also practiced crop rotation, intercropping, and organic fertilization to maintain soil fertility and prevent pests and diseases. Food was mostly consumed locally or traded regionally, and preserved by methods such as salting, drying, or fermenting. In the industrial age, food is mainly produced by large-scale agribusinesses that use modern technologies and machines, such as

Commented [12]: THEN VS NOW

animals that are genetically modified or selectively bred to increase yield and quality. They also use synthetic fertilizers, pesticides, and antibiotics to enhance productivity and prevent losses. Food is often transported over long distances or exported globally, and preserved by methods such as refrigeration, freezing, or canning .

- **Land stewardship:** In the agrarian age, land stewardship was based on a sense of connection and responsibility to the land and its resources. Farmers viewed themselves as part of nature and respected its cycles and limits. They practiced sustainable agriculture that enhanced biodiversity, soil health, water quality, climate resilience, and ecosystem services. They also valued the cultural and spiritual aspects of land and its heritage . In the industrial age, land stewardship is based on a logic of privatization and commodification of land and its resources. Agribusinesses view themselves as separate from nature and seek to control and exploit it. They practice intensive agriculture that degrades biodiversity, soil health, water quality, climate resilience, and ecosystem services. They also disregard the cultural and spiritual aspects of land and its heritage .
- **Hunger:** In the agrarian age, hunger was mainly caused by natural factors, such as droughts, floods, pests, diseases, or wars. These factors reduced food availability or accessibility for certain regions or populations. Hunger was also influenced by social factors, such as inequality, discrimination, or oppression. These factors affected food distribution or entitlement for certain groups or individuals . In the industrial age, hunger is mainly caused by human factors, such as poverty, conflict, climate change, or waste. These factors affect food affordability or utilization for millions of people. Hunger is also influenced by political factors, such as policies, markets, trade agreements, or subsidies. These factors affect food production or consumption for different countries or regions .

These are some of the differences between the agrarian age and the current industrial age in terms of how food, land stewardship and hunger all shifted. I hope this helps you with your inquiry.

Under One Sky

Fanastic. You are really helping me support a wider view of how to understand the current state of inequity we are in now, why so many go hungry, when there is so much food available, what is or the type of will, incentives, mindset or collective consciousness that must be involved, or is required to demonstrate a tipping point in order to make this shift to a system of equity, and food for all paradigm?

Thank you for your question. I think it is a very important and challenging one. There is no simple or definitive answer to what type of will, incentives, mindset or collective consciousness that must be involved, or is required to demonstrate a tipping point in order to make this shift to a system of equity and food for all paradigm. However, here are some of my thoughts:

- One possible type of will that must be involved is a ****moral will**** that is based on a sense of ethics, justice, and compassion. This type of will motivates people to act for the common good, not only for their own interests. It also recognizes the dignity and rights of all human beings, regardless of their differences or circumstances. A moral will can inspire people to challenge the status quo, demand accountability, and create alternatives for food system transformation .
- Another possible type of will that must be involved is a ****political will**** that is based on a vision, strategy, and leadership. This type of will enables people to mobilize resources, influence policies, and implement actions for food system transformation. It also involves building coalitions, alliances, and networks among different actors and stakeholders that share common goals and values. A political will can foster collaboration, innovation, and adaptation for food system transformation .
- One possible type of incentive that must be involved is a ****financial incentive**** that is based on a fair and efficient allocation of costs and benefits. This type of incentive encourages people to adopt practices and technologies that improve the sustainability and equity of food systems. It also involves reforming subsidies, taxes, prices, and markets that distort the true value of food production and consumption. A financial incentive can create opportunities, rewards, and recognition for food system transformation .
- Another possible type of incentive that must be involved is a ****social incentive**** that is based on a culture of participation, empowerment, and learning. This type of incentive engages people in the design, implementation, and evaluation of food system transformation. It also involves providing education, information, communication, and feedback that can enhance the knowledge, skills, and attitudes of people. A social incentive can foster awareness, trust, and solidarity for food system transformation .
- One possible type of mindset that must be involved is a ****systems thinking mindset**** that is based on a holistic and systemic understanding of the complexity and interdependence of food systems. This type of mindset helps people to identify the root causes and consequences of hunger and malnutrition, as well as the multiple dimensions and trade-offs of food production and consumption. It also enables people to

Commented [13]: NETWORK APPROACH

transformation .

- Another possible type of mindset that must be involved is a ****growth mindset**** that is based on a belief in the potential and possibility of change. This type of mindset motivates people to embrace challenges, learn from failures, and seek feedback for improvement. It also encourages people to experiment with new ideas, practices, or technologies that can enhance the efficiency, sustainability, or equity of food systems. A growth mindset can foster curiosity, creativity, and resilience for food system transformation .
- One possible type of collective consciousness that must be involved is a ****global citizenship consciousness**** that is based on a sense of belonging and responsibility to the world community. This type of consciousness inspires people to act for the common good, not only for their own interests. It also recognizes the interconnection and interdependence of all living beings and ecosystems. A global citizenship consciousness can foster empathy, compassion, and cooperation for food system transformation .
- Another possible type of collective consciousness that must be involved is a ****food citizenship consciousness**** that is based on a sense of agency and accountability for the food system and its outcomes. This type of consciousness empowers people to make informed and responsible food choices that reflect their values and interests. It also involves engaging in dialogue, action, or advocacy for food system transformation. A food citizenship consciousness can foster participation, representation, and empowerment for food system transformation .

Commented [14]: TRANSFORMATION OR BREAKTHROUGH MINDSETS

Commented [15]: JOAN HOLMES & DIALOG PLANETARY CITIZEN HANDBOOK

Commented [16]: SKYFARMS CONCEPT OF SHIFTING FOOD CONSUMERS TO FOOD CITIZENS

These are some possible types of wills incentives mindsets or collective consciousnesses that must be involved or are required to demonstrate a tipping point in order to make this shift to a system of equity and opportunity and food for all paradigm. I hope this helps you with your inquiry.

Under One Sky

What would proper stewardship of our local food system look like in action?
How could we change that petrochemical formula of 10 calories in 1 calorie yield and either balance it out and/or create a higher yield of output than input?

ChatGPT 4 (AI)

Thank you for your question. Proper stewardship of our local food system would look like a set of actions that aim to improve the efficiency, sustainability, and

examples of such actions are:

Commented [17]: PROPER STEWARDSHIP

- Using renewable energy sources, such as solar, wind, or biogas, to power farm equipment, irrigation systems, processing facilities, and transportation vehicles. This would reduce the dependence on fossil fuels and lower greenhouse gas emissions .
- Adopting sustainable agricultural practices, such as organic farming, agroecology, permaculture, or regenerative agriculture, that enhance soil health, biodiversity, water quality, and climate resilience. This would also reduce the use of synthetic fertilizers, pesticides, and antibiotics that can harm the environment and human health .
- Supporting local farmers and food businesses, especially small-scale, family-owned, and minority-owned ones, that produce and process food within the local area. This would increase the income and livelihoods of local food producers and processors, as well as the quality and diversity of food products available to consumers .
- Promoting local food consumption and education, such as through farmers markets, community supported agriculture (CSA), farm-to-school programs, or cooking classes. This would increase the awareness and appreciation of local food among consumers, as well as their access and affordability to nutritious and fresh food .
- Reducing food waste and loss, such as by improving storage and distribution systems, donating surplus food to food banks or charities, composting organic waste, or feeding it to animals. This would save energy and resources that would otherwise be wasted in producing and disposing of food that is not consumed .

To change the petrochemical formula of 10 calories in 1 calorie yield and either balance it out or create a higher yield of output than input, some possible strategies are:

- Increasing the efficiency of photosynthesis, such as by using genetic engineering or synthetic biology to modify plants to capture more sunlight or carbon dioxide, or to produce more biomass or edible parts .
- Reducing the energy losses in food processing and transportation, such as by using less heat or water in processing operations, optimizing packaging and refrigeration systems, or using shorter or alternative routes for delivery .
- Shifting dietary patterns towards more plant-based foods, such as by reducing the consumption of animal products that require more energy and resources to produce than plant products, or by choosing more efficient animal sources such as poultry or fish over beef or pork .

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Do you think AgTech has a role to play in this or controlled environment agriculture (CEA)? How could AI or technology support us in this transition or radical, rapid transformation to a system of equity?

ChatGPT 4 (AI)

I think **AgTech and CEA** have a role to play in this transformation, as they can offer some advantages over conventional agriculture, such as:

- **Higher productivity and quality:** AgTech and CEA can use technologies such as sensors, robotics, artificial intelligence, or biotechnology to optimize the growth conditions and management of crops and animals. This can increase the yield, quality, and consistency of food production, as well as reduce the risks of pests, diseases, or weather fluctuations .
- **Lower environmental impact:** AgTech and CEA can use technologies such as renewable energy, hydroponics, aeroponics, or vertical farming to reduce the use of land, water, energy, and chemicals in food production. This can also lower the greenhouse gas emissions, soil degradation, water pollution, and biodiversity loss associated with conventional agriculture .
- **Greater food security and equity:** AgTech and CEA can use technologies such as digital platforms, blockchain, or e-commerce to improve the access and affordability of food for consumers, especially in urban areas or remote regions. This can also enhance the traceability, transparency, and safety of food supply chains, as well as the income and livelihoods of food producers .

However, AgTech and CEA also face some challenges and limitations, such as:

- **High capital and operational costs:** AgTech and CEA require significant investments in infrastructure, equipment, and maintenance, which may not be affordable or accessible for many small-scale or low-income farmers. They may also depend on external inputs or services that may not be reliable or available in some areas .
- **Social and cultural barriers:** AgTech and CEA may encounter resistance or skepticism from some consumers or producers who prefer traditional or natural methods of food production or consumption. They may also raise ethical or regulatory issues related to the ownership, control, or impact of new technologies on food systems .
- **Knowledge and skills gaps:** AgTech and CEA require specialized knowledge and skills to operate and manage the technologies involved in food production. This may create a need for education, training, or

technologies by farmers or consumers .

Therefore, I think **AI or technology can support us** in this transition or radical transformation to a system of equity by:

- Providing data-driven insights and solutions that can improve the efficiency, sustainability, and equity of food systems .
- Enabling innovation and collaboration among different actors and stakeholders that can create positive change in food systems .
- Empowering consumers and producers to make informed and responsible food choices that reflect their values and interests .

Under One Sky

Is it possible to create a closed-loop food system locally, or in a greenhouse or biosphere. One that requires only a one time investment of energy and that can sustain itself, including seed banks, and other complex ideas such as apiaries and bees to pollinate, and the nutrients that are required to regenerate the soil, and capture carbon? If not, can you breakdown some of the elements that are required for a successful food for all type of food growth for a local system that might be demonstrated on a smaller scale, then replicated and turned into a cascade that permeates the global system?

ChatGPT 4 (AI)

I think it is very difficult, if not impossible, to create a closed-loop food system locally, or in a greenhouse or biosphere, that requires only a one-time investment of energy and that can sustain itself. This is because every food system involves some degree of entropy, which means the disorder or randomness of the system increases over time. Entropy causes energy and matter to be lost or degraded in the process of food production and consumption, such as through heat, evaporation, respiration, decomposition, or waste. Therefore, every food system needs some external inputs or outputs to maintain its function and balance.

However, I think it is possible to create a more efficient and sustainable food system locally, or in a greenhouse or biosphere, that minimizes the energy and matter losses and maximizes the recycling and reuse of resources. Some of the elements that are required for such a food system are:

- **Renewable energy sources**, such as solar, wind, or biogas, that can power the food system with minimal greenhouse gas emissions and fossil fuel dependence .

permaculture, or regenerative agriculture, that can enhance soil health, biodiversity, water quality, and climate resilience. These practices can also reduce the use of synthetic fertilizers, pesticides, and antibiotics that can harm the environment and human health .

- **Local food production and consumption**, such as through urban agriculture, community gardens, or rooftop farms, that can reduce the distance and dependence on external inputs and markets. These methods can also increase the diversity and quality of food products available to consumers .
- **Circular economy principles**, such as reducing food waste and loss, recovering value from food by-products, or composting organic waste. These principles can help to optimize the use of resources, energy, and nutrients in the food system, and to create new opportunities for income generation, employment, and environmental protection .
- **Social and cultural factors**, such as education, awareness, participation, empowerment, and cooperation among different actors and stakeholders in the food system. These factors can foster a sense of connection and responsibility for the food system and its outcomes .

These are some of the elements that are required for a successful food for all type of food growth for a local system that might be demonstrated on a smaller scale. I think such a system could be replicated and turned into a cascade that permeates the global system if there is enough political will, financial incentive, social incentive, systems thinking mindset, growth mindset, global citizenship consciousness, and food citizenship consciousness among people.

Under One Sky

How do you think **composting and/or making soil** come into play here? Solutions like makesoil movement or Kalea technology seem to be achieving this. What about collecting water, **rain water catchment**, storage or water conservation? How does that factor into this? And also last but not least the idea of **using food waste in a biogas, or energy**? Solutions like waste transformers in Amsterdam seem to be doing this.

ChatGPT 4 (AI)

Thank you for your question. I think composting and making soil are important ways to reduce food waste and improve soil quality. Composting is a process that converts organic waste, such as food scraps, yard trimmings, or manure, into a nutrient-rich soil amendment that can be used for gardening or farming.

compost, to existing soil to enhance its fertility and structure . Some solutions that are achieving this are:

- **Makesoil movement:** This is a global network of people who make soil together by sharing their organic waste, compost bins, and knowledge. The movement aims to create healthy soil for growing food, sequestering carbon, and restoring ecosystems.
- **Kalea technology:** This is a device that transforms kitchen waste into compost in just 48 hours. The device uses a combination of mechanical shredding, heating, and microbial fermentation to accelerate the composting process. The device also reduces the volume and odor of the waste.

I think collecting water, rainwater catchment, storage or water conservation are also essential for creating a sustainable food system. Collecting water is a practice that involves capturing and storing rainwater or other sources of water for later use. Rainwater catchment is a specific type of water collection that uses roofs, gutters, tanks, or barrels to collect rainwater. Storage is a method that involves keeping the collected water in a safe and accessible place. Water conservation is a strategy that involves reducing the amount or improving the efficiency of water use . Some benefits of these practices are:

- They can reduce the demand and cost of municipal water supply
- They can provide a reliable and clean source of water for irrigation, drinking, or other purposes
- They can prevent stormwater runoff and erosion that can pollute waterways
- They can enhance water quality and quantity in groundwater and surface water

I think using food waste in biogas or energy is another way to create a circular food system. Biogas is a renewable source of energy that is produced by anaerobic digestion of organic matter, such as food waste, animal manure, or sewage sludge. Biogas can be used to generate heat, electricity, or fuel for various applications . Some benefits of using food waste in biogas are:

- It can reduce the amount and impact of food waste in landfills
- It can produce renewable energy that can replace fossil fuels
- It can generate income and jobs for farmers and communities
- It can produce digestate that can be used as fertilizer or soil conditioner

Some solutions that are using food waste in biogas are:

- **Waste Transformers:** This is a company that installs modular biogas plants in urban areas that convert organic waste into biogas, electricity, heat,

greenhouse gas emissions.

- HomeBiogas: This is a device that converts household food waste into biogas for cooking and fertilizer for gardening. The device uses a simple and safe process that does not require electricity or maintenance.

Under One Sky

Do you think we have covered all the ideas, methods, technology and actions that could be involved in transforming systems of inequity that allow hunger to persist toward a system where everyone has access to food, entering an age of food sovereignty have been covered? If you have any further insights we have missed please share them now.

ChatGPT 4 (AI)

I think we have covered many of the ideas, methods, technology and actions that could be involved in transforming systems of inequity that allow hunger to persist toward a system where everyone has access to food, entering an age of food sovereignty. However, I do not claim to have an exhaustive or definitive list of all the possible solutions or strategies for this complex and multifaceted challenge. There may be other aspects or perspectives that we have not explored or considered yet. Therefore, I would like to share some further insights that we may have missed or overlooked:

- One insight is that **food system transformation requires a human rights-based approach** that recognizes the right to food as a fundamental and universal right for all people. This approach implies that states have the obligation to respect, protect, and fulfill the right to food for their citizens, and that citizens have the ability to claim and enjoy their right to food without discrimination or interference . A human rights-based approach also implies that food system transformation should be guided by the principles of participation, accountability, non-discrimination, empowerment, and rule of law.
- Another insight is that **food system transformation requires a cultural shift** that challenges and changes the dominant narratives, norms, and values that shape our relationship with food and nature. These narratives, norms, and values influence our food choices, preferences, habits, and behaviors, as well as our attitudes, beliefs, and emotions about food and nature . A cultural shift involves creating new narratives, norms, and values that celebrate and support diversity, health, sustainability, and equity in food systems .

change** that addresses the root causes and structural drivers of hunger and malnutrition, rather than the symptoms or outcomes. These root causes and structural drivers include poverty, inequality, conflict, climate change, corruption, and power imbalances . A systemic change involves transforming the policies, institutions, governance structures, and power relations that shape food systems at all levels .

These are some further insights that we may have missed or overlooked in our discussion. I hope this helps you with your consultation for the hunger project.

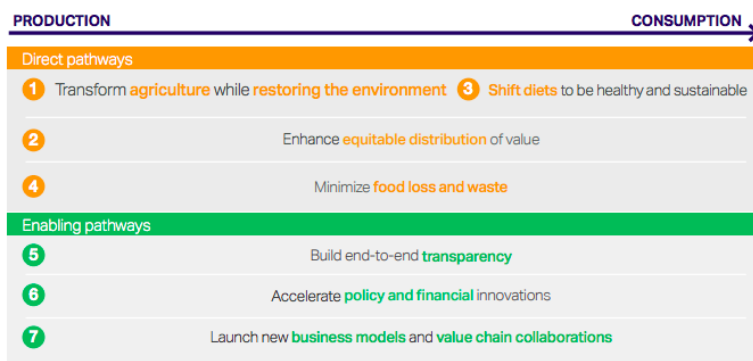
Under One Sky

Could you now include a closing statement with suggestions for context, like a declaration and also, the content, such as suggested ways to move forward?

Under One Sky

And one last thing, could you provide us with some ideas based on this photo I am sharing?

SEVEN PATHWAYS WHERE BUSINESS CAN LEAD TO ACCELERATE TRANSFORMATION



ChatGPT 4 (AI)

business can lead to accelerate transformation. The infographic is divided into two sections: production and consumption. The production section has three pathways: (1) Transform agriculture while restoring the environment; (2) Ensure equitable distribution of value; and (3) Minimize food loss and waste. The consumption section has four pathways: (1) Shift diets to be healthy and sustainable; (2) Accelerate end-to-end transparency; (3) Build policy and financial innovations; and (4) Launch new business models and value chain collaborations.

Under One Sky

Can you provide us some ideas about this as a closing argument for business case study?

ChatGPT 4 (AI)

Thank you for your question. I think this infographic shows some interesting and relevant ideas for a business case study on food system transformation. Here are some possible points that you could include in your closing argument:

- You could emphasize the importance and urgency of transforming food systems for a world without hunger, and how business can play a leading role in this process. You could cite some of the facts and figures from the infographic, such as the number of people who are hungry or malnourished, the environmental impact of food production and consumption, or the economic opportunity of sustainable food solutions.
- You could highlight the benefits and challenges of each of the seven pathways where business can lead to accelerate transformation, and how they relate to your specific context and goals. You could use examples from the infographic, such as how transforming agriculture can restore the environment, how ensuring equitable distribution of value can improve livelihoods, or how shifting diets can promote health and sustainability.
- You could propose some concrete actions or recommendations that you or your organization can take to implement or support one or more of the pathways, and what outcomes or impacts you expect to achieve. You could also mention some of the partners or stakeholders that you would need to collaborate with, and what resources or incentives you would need to mobilize.

CLOSING STATEMENT

paper. We hope that it has given you some insights and inspiration for your consultation for the hunger project. We believe that transforming food systems for a world without hunger is not only possible, but necessary and urgent. We also believe that biomimicry and systems thinking can provide us with valuable principles and tools to guide and support this transformation.

We invite you to join us in declaring our commitment to transforming food systems for a world without hunger, and to take action to achieve this vision. We suggest the following steps:

- [Sign the declaration that we have drafted, which outlines our goals, values, and principles for food system transformation.](#)
- [Share the declaration with your network, colleagues, partners, and stakeholders, and encourage them to sign it as well.](#)
- [Review the suggestions for action](#) that we have provided, and select the ones that are most relevant and feasible for your context and capacity.
- [Implement the actions that you have selected](#), and monitor and evaluate their progress and impact.
- [Communicate and collaborate](#) with other actors and stakeholders who are working on food system transformation, and learn from their experiences and best practices.
- [Celebrate your achievements and challenges](#), and share your stories and lessons learned with us and others.

We look forward to hearing from you and working with you on this important and exciting journey. Together, we can make a difference.

APPENDIX

[UN Food Systems Summit Dialog by SkyFarms](#)

[Donut Economics](#)

[Food for All](#)

[Growing Home Urban Farm](#)

[Energy Usage](#)

[Energy and Food Production](#)

[Waste Transformers BioFuel](#)

[Food-Energy-Water Nexus](#)

[Kitchen Composter Soil Kind \(fka Kalea\)](#)

[Make Soil](#)

[Nate Hagens Energy Economy](#)

[CEA \(Controlled Environmental Agriculture\)](#)

[Oxman](#)