As the world grapples with increasing human and planetary health crises, there is a growing recognition that food systems transformation is a central part of any solution. The United Nations 2021 Food System Summit is a watershed event, convening decision-makers aiming to launch bold new actions to transform the way the world produces and consumes food—delivering progress on all 17 of the UN’s Sustainable Development Goals. However, without eliciting clear, compelling game-changing solutions, the Summit risks being a platform for discourse rather than action.

This situation inspired The Rockefeller Foundation’s Food Initiative to support the creation of the Food Systems Game Changers Lab, an interactive program that aimed to support food systems innovators to develop their ideas and bring them to life. The Lab supported 505 participants from 85 countries who spent 13-weeks immersed in systems thinking curriculum, coming together to design game changing, collective food systems solutions borne of collaboration.

The result is 24 promising Cohorts - each with a clear outline of their respective food systems challenges, actionable solution sets, and a readiness to work with other individuals and organizations to bring their visions to reality.

We compiled this Action Agenda Compendium so that individuals, businesses, non-profits, governments and others can learn from the Food Systems Game Changers Lab so that they can continue the critical work of food systems transformation long after the United Nations 2021 Food Systems Summit but it is possible, and we hope that our efforts will support a more just, equitable and sustainable world.

Dr. Roy Steiner
Senior Vice President, Food Initiative The Rockefeller Foundation
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This publication was prepared for The Rockefeller Foundation. The findings and conclusions contained within are those of the authors and do not necessarily reflect positions or policies of The Rockefeller Foundation.
Introduction

Tasked with feeding a projected 10 billion people everyday by the year 2050, the global food system is a vast and complex web of interconnected industries, policies, technologies, workers, and consumers. Over the course of the 20th century, we have witnessed extraordinary innovations and expansions within global food systems as technological advances allowed farmers and fishermen to work more efficiently, and food commodities to travel longer distances and be stored for longer periods of time. However, we have also witnessed immense and ongoing failures within our global food system that have had catastrophic impacts.

The global food system is one of the major sources of greenhouse gas emissions, contributing to the rise in climate catastrophes around the world. In return, climate catastrophes have had disastrous impacts on local food security and farming networks from which many communities cannot recover. Sadly and simultaneously, the global food system struggles to provide adequate, affordable, and accessible nourishment for the world’s populations.

Currently the global food system is controlled by a few extremely large corporations who own the inputs and set the terms for local industries. For instance, just four corporations — Bayer, Corteva, ChemChina and Limagrain — control more than 50% of the world’s seeds.¹ Depending largely on a factory model of production, our current food and farming practices have led to wide scale degradation of our soils and the destruction of critical natural resources. The human rights and labor abuses reported against workers in these industries is ongoing and all too common.

Around the world, communities are dealing with increasing and fatal rates of both obesity and undernutrition, vitamin deficiencies and diet-related diseases - the overlapping problems that emerge from malnutrition and improper nutrition. All of these failures have only been exacerbated by the COVID-19 pandemic and a continual failure of change-agents to meaningfully emerge from their siloed approach to policy and action.

As we look to 2050, the mounting pressures to deliver affordable, available, accessible, nourishing, regeneratively and humanely produced diets will take unparalleled levels of global collaboration, agenda-setting, and innovation. To rectify these multiple and quickly expanding crises, we need much more than change - we need transformation, or, as agroecologist Steve Gliessman writes, “a total paradigm shift.”²

² Gliessman (2021), Transforming the food system: what does it mean?.
Food Systems Game Changer Lab: Accelerating Paradigm Transformation

The Food Systems Game Changers Lab was born out of this dire need for a paradigm shift in how the world produces and consumes food. We recognize that our global food system is in crisis and that the fragility of the system will have disastrous outcomes for our people and planet in the years to come absent major intervention.

The EAT Foundation and The Rockefeller Foundation in collaboration with Meridian Institute, IDEO, Thought For Food, Forum for the Future, SecondMuse, and Impact 2 Intention launched the Food Systems Game Changers lab as an offering to demonstrate radical transformation is possible and can be achieved through democratized cross-cutting food systems solutions that are sparked and incubated through inclusive, global collaborative innovation. In short: collective action to drive collective solutions.

To catalyze real change, we need to organize the people, ideas, and resources that promote sustainability, nutrition, resilience, justice, equity, and radical transformation. Social movements have shown us time and time again that local communities, innovators, entrepreneurs and changemakers already have the solutions. By coming together and utilizing the power of collective action, these solutions can be made more potent and create the change we need - from the ground up.
The Food Systems Game Changers Lab is an innovative, people-centered approach to engaging individuals, civil society organizations, food companies, and governments in co-creating and enacting transformative solutions to revolutionize food systems.

The experience is powered by “game changers” from across the globe who have each designed their own innovative solutions that have the potential to bring positive change to global food systems. Game changers —individuals and teams— within the Lab not only brought their own solutions and expertise, but also the passion, grit, collaborative spirit, and the determination required to combine and reimagine their solutions in partnership with others.

The Lab catalyzed a shift from “me” to “we” in which game changers compiled their individual innovations together, building integrated, collective solutions sets, called ‘Action Agendas’, presented openly and globally via this Compendium and an array of events surrounding the first-ever United Nations Food Systems Summit.
About the Food Systems Game Changers Lab

The Lab is a multi-phase program in support of the UN Food Systems Summit (UNFSS) that sources ideas, innovations and initiatives that match the priority solutions of the Summit.

Through a global open call and selection process, the Food Systems Game Changers Lab formulated 24 Solution Cohorts composed of 412 solutions from representatives of 85 countries. Each Solution Cohort brims with diverse innovators who spent 3 months in an experiential learning Solutions Accelerator, combining their solutions together and building a narrative around the how/what/why/who needed to realize their collective solution sets at scale. See the Annex for more details about the format of the Food Systems Game Changers Lab Accelerator.

The Lab’s Solutions Accelerator enabled innovators to jointly build Action Agendas that illustrate the potential impact, challenges, opportunities, and resources needed/available to advance each Solution Cohort’s collective solution in specific systems.

Through matchmaking, national/city governments, funders, companies, investors, coalitions and other food systems leaders can learn about the collective solution sets and engage directly the Solution Cohorts to explore potential for partnership and alignment.
Introduction

The impetus for the Food Systems Game Changers Lab was to elevate community-driven solutions within the 2021 UN Food Systems Summit - a historic opportunity to leverage the power of food systems to drive our recovery from the COVID-19 pandemic and get us back on track to achieve the 17 Sustainable Development Goals (SDGs) by 2030.

Between April 2020 and September 2021, the Summit brought together all UN Member States and constituencies around the world – including thousands of youth, food producers, Indigenous Peoples, civil society, researchers, private sector actors, and the UN system – to create tangible, positive changes to the world’s food systems. As a people’s summit and a solutions summit, it recognized that everyone, everywhere must take action and work together to transform the way the world produces, consumes, and thinks about food.

The Summit offered a catalytic moment for public mobilization and actionable commitments by heads of state and government and other constituency leaders to move forward the Action Agendas put forth by the over 400 teams active in the Game Changers Lab.

You are invited to explore this Compendium and dive into the collective solution sets developed via the Lab on topics ranging from elevating indigenous food systems, innovating protein, and scaling agroforestry to mainstreaming true cost accounting, upskilling farmers, and developing food system leaders.
Following the UN Food Systems Summit, countries, cities, funders, and companies (i.e., Scaling Partners) are invited to learn more about the collective solution sets developed by the Game Changers Lab participants through a matchmaking process.

The matchmaking process seeks to enable cross-sector partnerships between Scaling Partners and Solution Cohorts to leverage unique strengths, unlock resources, and cultivate enabling environments needed to make meaningful change, and co-create a blueprint to turn collective solutions into a unified reality.

Matchmaking can occur in two ways:
1. Via virtual matchmaking events immediately following the UN Food Systems Summit (September/October 2021)
2. By taking the initiative to review the Action Agendas shared in this Compendium and reaching out directly to any of the 24 Solution Cohorts of interest who stand by eager to engage with new partners.

Either option provides a doorway to partnership and the Action Agendas offered in this Compendium serve as a calling card to define the area of focus, benefits, insights, and resources each Solution Cohort offers.

The following section includes summaries about the collective solution sets put forth by the 24 Cohorts:
1. Empowering Women and Youth
2. Elevating Indigenous Food Systems
3. Feeding Children Nutritiously
4. Upcycling Food and Materials
5. Reducing Food Loss and Waste
6. Developing Food Systems Leaders
7. Innovating Protein
8. Innovating Packaging
9. Innovating at the Ag-Energy Nexus
10. Building Soil Health
11. Mainstreaming Regenerative and Agroecological Approaches
12. Scaling Agroforestry
13. Unlocking Data for Food Systems Governance
14. Upskilling Farmers through Education
15. Democratizing Food Systems Technology
16. Scaling Controlled-Environment Agriculture
17. Empowering Community Farming
18. Building Resilient Local Food Systems
19. Enabling Affordable and Accessible Nutrition
20. Incentivizing Dietary Shifts
21. Building Food Literacy Through Education
22. Mainstreaming True Cost Accounting
23. Making Markets for Farmers
24. Promoting Food Safety and Traceability
Pathways to Transformation: The Power of the Action Agenda

At the heart of the Food Systems Game Changers Lab was the journey taken by each Solution Cohort to co-create an Action Agenda that offers a vision for future food systems that are sustainable, equitable, healthy, and diverse as well as a transformative pathway to actualize that vision through a particular collective solution set.

The 24 Action Agendas included in this Compendium are composed of seven major elements, each of which is described below.

**The Need**
Highlights what gaps exist in the food system pertinent to a particular challenge and articulates why specific systemic interventions are required to fill these gaps and make positive change.

**The Solution**
Proposes the Solution Cohort’s collective solution set and a vision for the future in which a particular food system challenge is resolved. These solutions span a range including technology, policy, knowledge resources, data, partnerships, and other innovations.

**The Impact**
Outlines the systemic shifts that may result as outcomes of the collective solution set in the short, medium, and long term — across local, national, and global contexts.

**From Barriers to Opportunities**
Articulates factors (e.g., policies, institutions, actors) that enable or impede the ability of the collective solution to create change.

**Navigating Unknowns**
Discusses the broader context in which the collective solution set operates, including synergies, trade-offs, unintended consequences, and externalities that may exist. Further, this section shares tactics to mitigate these conditions to maximize the feasibility and sustainability of the collective solution set.

**Partnerships Needed**
Describes opportunities for Scaling Partners (e.g., UN Member States, subnational governments, companies, funders, etc) and other food systems stakeholders to elevate the collective solution set’s ability to create transformation.

**Similar Solutions in Action**
Offers case studies or promising practices currently being employed that reinforce the viability of the proposed collective solution set.
Synthesis - Looking Across All 24 Action Agendas

While each Action Agenda is a standalone document — offering a unique vision and pathway for the future of food systems — as a collective body of work, they offer powerful insights. Across the 24 Action Agendas, countless aspects of the global food system are interrogated, reimagined, and innovated, a brief synthesis of which follows.

The Need
Collective solutions sets within the 24 Action Agendas expose the myriad of current practices, policies, and mindsets eroding the value of the food system. Ranging from nutrition misinformation, to climate change, to acculturation, to harmful soil management practices, the Action Agendas offer a diverse chorus of global perspectives on why it is imperative that we reimagine food system solutions.

The Solution
The collective solutions put forth inspire and invite the reader to rethink what they may know about the innovation space within food systems. From virtual resource hubs, to nutrition campaigns, to educational curricula, to product development, the collective solutions posed have potential to transform the lives of farmers in developing countries, policy makers, educators, children, researchers, and even an unassuming individual with nearly expired mil.

The Impact
The pathways to sustainable impact provided in the Action Agendas are as diverse as they are enticing. Each Action Agenda proposes short term, medium term, and long term outcomes that ladder up to an interconnected vision of empowerment, resilience, diversity, and global interconnectedness. Whether it is connecting indigenous food communities, increasing the agency of women in agriculture, boosting food literacy, or promoting a fully circular economy with zero waste, the impacts outlined are audacious, liberating, and urgent.

Partnerships Needed
The 24 Action Agendas remind us that we all have an important role to play in transforming the current food system into one that is sustainable, equitable, healthy, and diverse. Solution Cohorts call-out and call-in a multitude of actors such as government officials, companies, and funders to partake in our collective journey to transform the future of food.
Next Steps to Put Agendas into Action

DEAR SCALING PARTNERS,
THIS IS THE SIGN YOU’VE BEEN WAITING FOR.

Partners eager to take action on priority challenges have built joint Action Agendas as calling cards, beacons, and roadmaps. Yet, the shifts in food systems called for within the Action Agendas hinge on partnership. And that means the next steps needed to actualize these visions are YOURS.

1. **Reach out to the Solution Cohorts** aligned to your priority food systems challenges. Their commitment to collaborative innovation and partnership has been honed and tested over the course of the intensive Accelerator process, and they are ready to engage.

2. **Partner with a team of dedicated problem-solvers and stakeholders** aligned to your food systems priority areas, and further co-develop solutions based on an Action Agenda that meets your needs.

3. Leverage others’ investments in collaborative innovation and explore opportunities for co-financing.

4. Pilot and scale solutions to create maximum impact. Learn from successful solutions that other Scaling Partners have implemented and continue to share lessons to keep the innovation going.

5. Take advantage of post-Accelerator support to fuel partnership formation between your institution and a Solution Cohort.
01: Empowering Women and Youth

Cohort Team Members: Bayira Rural Women’s Development Association (BARWODA) (Jonesi Muhindo, Moreen Mbabazi, Mitse Robert), Malnutrition Matters/IFDC (Hart Jansson, Caroline Sage, Anna Kanaley), MoooFarm, India (Harmeet Kaur, Param Singh), Mosaic Grove, LLC (Kaadze Wright, Vida Akumah Boateng), Centre for Advancement of Women in Agriculture in Tanzania (CAWAT) (Rose Rita Kingamkono), Catalina Zamora Fonck, Newcomer Kitchen (Cara Benjamin-Pace), Amazon Agro-processing Hub (Salifu Patience), The Harvest Fund (Michelle Kurian), Self Employed Women’s Association (Mansi Shah, Yasmin Bhada), Grace Olloko Holy Hands Legacy LTD (Ambrose Obi). This Cohort was guided by Hira Wajahat.
Our solution empowers innovative women and youth-led agri-food-tech MSMEs through a locally-led Climate Smart Agro Hub, which provides low-cost inputs and technologies; education on business, agri-processing, and nutrition; support with best cultivation practices, leadership development, and policy advocacy. This Hub bridges the gender gap and creates agribusiness opportunities for smallholder farmers and wage-earners.

The Need

An estimated 2 billion people in the world lacked regular access to safe, nutritious, and sufficient food in 2019. If recent trends continue, over 840 million will be affected by hunger by 2030, or 9.8% of the global population (Goal 2: Zero Hunger – UN SDGs). Globally, 10% of the world is living on less than $2 a day and Covid-19 has compounded the forces of conflict and climate change, which were already slowing poverty reduction progress.¹

With support from partners, our local climate smart agro hubs will ensure sustainable, long-term access to affordable food for 100's of millions, income, livelihood and social security for millions of women and youth.

The income generation will provide a foundation for greater agency in their communities for women and youth. A community support system from the Agro Hub would provide continuous education and mentorship opportunities, upskilling and capacity building of the women, youth and their enterprises, enabling them towards improved decision making. Dialogues hosted within the local communities will assist the entire community in understanding the benefits of greater agency of women and youth.

The Solution

A locally managed Climate Smart Agro Hub that would provide commodity inputs, training and support to women and youth smallholder farmers to increase their outputs and incomes in a sustainable manner.

Key aspects of the Hub:

- Designed to utilize modern management techniques and digital training platforms. This will aid in scalability and replication.
- Provide training and support to landless women and youth entrepreneurs involved in agri-processing to produce nutrient-dense affordable foods
- Initially implemented in the global South
- Provide a low cost technology platform to the farmers for extension services, selling products and farm data management
- Implemented by Cohort 1 members depending on the country of implementation, as well as local partners (e.g. cooperatives) who share the women and youth empowerment objectives, and will be led and staffed by trained local women and youth
- Women and youth in the region will be directly influenced, and all members of the community will benefit indirectly from greater prosperity and increased availability of affordable nutrient-dense foods

The AGRO WaY: Climate Smart Agro Hub will empower women and youth by providing access to skill building, education, financial resources, and agro-processing capacity.

**SHORT TERM IMPACT**
Income generation will be enabled or increased for thousands of Hub members; increased awareness and education about climate smart agriculture; strengthened livelihoods of women and youth in rural areas; better and affordable access to technology, information, financial services, and markets.

**MEDIUM TERM IMPACT**
Increased agency of women and youth; reduced input cost and increased agricultural yield of beneficiaries; livelihood opportunities generated for women and youth in MSMEs; direct market linkages through Hub.

**LONG TERM IMPACT**
All community members, including men, will see the benefit of increased agency of women and youth and will actively encourage enforcement of pro-women/youth policies; this will lead to additional women/youth policies being enabled and/or implemented; asset creation in the name of the women; improved agriculture; local decentralized economy; reduced rural out-migration; decent jobs; increase asset ownership among women; younger women will have more options for their future; the Agro Hub will facilitate contributions from the smallholder farmers to achieve SDGs 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 13, 16, and 17.
Our solution reflects inclusivity through the bottom-up approach to meet global needs and responds to the greatest need at the grassroots level, with no profit leakage. Our equitable approach works with the local people to understand their circumstances and challenges; the solution exhibits potential to be implemented at local levels to provide high value to those in need, while offering systemic change in gender equity, food systems and health.
## Turning Barriers into Opportunities

### Environmental Barriers
Detrimental climate change may affect production, harvesting and post-harvesting management, transportation of produce, water sources, soil health, and infrastructure in unpredicted ways. Droughts, floods, and other natural disasters influenced by climate change could affect the impacts.

Steps to overcome the environmental barriers include education for smallholder farmers about the impact of climate change, training on sound environmental practices, and implementation of sustainable technology that helps to improve resilience when responding to climate change events.

### Social and Economic Barriers
Lack of access to finance, specifically by women and youth, lack of women’s collective action and participation in the household decision-making process, women having a heavier workload on farms and in the home, men making profits even though the women are doing the labor, lack of access to technology and productive assets, and the idea that women and youth are not supposed to be heard in public.

Overcoming the livelihood barriers can be done with education, sharing of the workload, gender policy improvement, community dialogues that enhance knowledge and understanding of community members on the benefits of women empowerment (economically and socially), access to low-cost technology, education of women in business, finance, health, nutrition, and women’s rights and empowerment, and incentivizing youth to become agro enterprisers, as well as linking youth with affordable agro-financing.

### Health Barriers
Community leadership and decision making reinforces patriarchal norms around women and girls’ domestic and reproductive roles, therefore affecting women’s mental and physical health.

Steps to overcome the health barriers include improving women’s agency (economic education/skills, leadership capabilities), embedding women-focused education at the primary school level to create new models of thinking, and developing a Ministry of Women and Youth to implement agenda actions.
Navigating Unknowns

Potential Unintended Consequences

While we believe that our solution benefits entire communities, unintended consequences that our solution could trigger are:

- Anti-feminists responding with violence and protest as women gain empowerment
- Protest from big corporations and large farms that are against smallholder farmers
- Education could mean that fewer people want to go into farming, and would instead want to find a different career

Thinking Ahead - strategies to avoid these consequences

These risks can be lessened with community dialogue that outlines the benefits of empowering women and youth in food systems, as well as incorporating local input from each community. Through constructive discussions and opportunities for community members to share their thoughts, we believe the shared benefits for all will be made apparent.

The roles and responsibilities of the Scaling Partner will include the following:

- Funding for the initial establishment of the Climate Smart Agro Hub
- Providing/facilitating access to finance and technology for the Hub members
- Facilitating linkages with academia, technology providers, banking and insurance providers, and local & central governments
- Continuous monitoring and evaluation as well as guidance to help achieve the targeted impacts
MoooFarm, a global innovator at World Economic Forum, is focused on strengthening the agency of women and small-scale farmer entrepreneurs by building hyper-local connected commerce. It uses a low cost technology platform, available free of cost to all the farmers in India with 10,00,000+ app downloads. These farmers are further supported and handheld by community leaders (village level extension officers). Following this phygital model (physical and digital), MoooFarm has undertaken pilots with Animal Husbandry Maharashtra State Government, Unilever - Prabhat Project with 30,000+ dairy farmers that have shown that:

**Similar Solutions in Action**

Farmers usually pay $8 for each veterinarian visit at their doorstep but as per our findings

**80%**

of the farmer’s problems can be solved virtually using our mobile application. They only require one VET visit incurring only 20% cost.

Farmers stated increase in milk production for a minimum of **2 to 4 litres per cattle/day** leading to a monthly revenue increase of **$56-$84**

Due to increased revenue and reduced expenses, farmers monthly profit increased by **$80- $130**

Further, as per the study on Social Return of Investment framework, **every $1 invested** in MoooFarm returns **$5.54**

worth of impact in the lives of economically deprived farmers in India.
EMPOWERING COMMUNITIES WITH AUTONOMY & LEADERSHIP

Cohort Participation Countries

Cohort 1 | Empowering Women and Youth

Mosaic Grove

CAWAT
Centre for the Advancement of Women in Agriculture in Tanzania

moofarm

Condiment-Plus
...great taste, great meals.

Harvest Fund
02: Elevating Indigenous Food Systems

Cohort Team Members: Prairie Food System Vision Network (Priscilla Settee, Marla Carlson, Paul Hanley), Pacific Community (SPC) (Karen Mapusua, Amini Loco, Edward Boydell, Pete Sinclair, and others), Anna Jia, Oceans Alive (Ledama Masidza), Village Farmers Initiative (VFI) (Asikaralu Okafor), Meli Bees Network gUG (Ana Rosa). This Cohort was guided by Chelcie Vallely.
We are a global community of Indigenous peoples and allies using connected localized solutions labs and toolkits to bring people together to decolonize and transform food systems. Our aim is to make culturally appropriate nutritious food accessible and affordable for everyone and achieve nutritional security within planetary boundaries.

The Need

Our solution is based on the understanding that it is no longer possible to look at food, livelihoods, health and the management of natural resources separately. 

Embracing systems-thinking through holistic, Indigenous approaches is needed to address these complex and interdependent challenges.

Agroecology, then, is not just a set of agricultural practices. It focuses on changing social relationships, empowering farmers, adding value locally and privileging short value chains. It allows farmers to adapt to climate change and to sustainably use and conserve natural resources and biodiversity.

The Solution

We are a global community of Indigenous peoples and allies transforming food systems, using connective localized solutions labs and toolkits that bring people together with the overall aim of making nutritious food available, accessible and affordable for everyone and positively influencing mindsets to achieve food and nutritional security and the responsible use of natural resources.

We aim to pilot four solutions labs in geographically and culturally diverse locations within our global network. Along with the pilot solutions labs, we are also building a platform with various toolkits, including case studies relevant to Indigenous communities that are piloting the solutions lab. This platform will be designed so it is easily accessible and can be leveraged by the participants in the solutions labs to tackle local problems.

The network of solutions labs promote and enhance Indigenous food systems for equality and inclusivity, strengthen Indigenous voices at a key corporate and policy level, and ensure that Indigenous food systems are not engulfed by the global anthropogenic factors that affect our world today, such as climate change, but rather break into the future as a stronger force of environmental, social, economic and mindset change.
The Impact

Our solution promotes Indigenous knowledge, agroecology and regenerative natural resource management practices. The global network of solutions labs supports and acts as an ally in voicing the rights of Indigenous peoples and the importance of Indigenous food and ecological knowledge. Together, we will pave a path to an equitable, sustainable food systems future.

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<tr>
<th>SHORT TERM IMPACT:</th>
<th>MEDIUM TERM IMPACT:</th>
<th>LONG TERM IMPACT:</th>
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<tbody>
<tr>
<td>Indigenous communities and allies are supported to identify and test local solutions</td>
<td>Equitable food and nutrition security solutions are shared among Indigenous communities globally</td>
<td>Parity between Indigenous and non Indigenous knowledge systems in contributing solutions to transform our food systems</td>
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</table>
Localised solution labs and toolkits are an opportunity to promote and celebrate local food solution development. It is envisioned that the solution lab journey for communities and individuals alike will result in knowledge sharing and empowerment, promote confidence, and provide individual and collective self worth, providing a sense of well being and connectedness through the exchange of ideas at both the local and global scale.
**Turning Barriers into Opportunities**

Existing colonial structures and mindsets often devalue, dismiss, or exclude non-scientific, traditional or alternate knowledge sources and practices. Power dynamics favor conformity to institutionalized colonial governance, education, and trading structures and systems, at the exclusion of alternate and more diverse approaches. This has often resulted in lack of access to land, natural resources, and infrastructure to engage in regenerative agriculture, agroecology, and nature positive production that would protect and restore people, planet and climate by connecting Indigenous communities to the resources they own.

Biodiversity is undervalued and poorly protected. Monoculture practices focus on the promotion of financial return, often to the detriment of natural resources (forests, soils, water, insects, species loss) and the exclusion of alternate Indigenous and traditional approaches. Monoculture practices are promoted by big industry whose financial interests are at often odds with smaller and diverse approaches.

The lack of effective connections and communications within and between Indigenous communities and members results in an increasing sense of disconnection between communities, the environment, and food systems whereby communities, and individuals are less able to address or identify with others facing similar issues and threats (changing climate, uncertain futures, poverty divide) resulting in a learned helplessness at the individual and collective scale.

Create an enabling environment, platform, or space which promotes a common approach to sharing of knowledge and ideas and challenges the existing power dynamics (colonial and traditional). This inclusive space fosters connectedness through shared language, experiences and resources. Story telling—common across all cultural settings—creates a shared vision inclusive of Indigenous people and encourages ownership of collective solutions. Stories of local solutions can then be shared on a common digital platform. Power dynamics can be shifted through inclusivity, cultural context, language, shared expertise and resources.

The solution lab approach is designed and implemented at appropriate scales (village, district, and region), promoting connection to and between communities with common language, governance structures, and environments, helping to build unity of vision and purpose. This captures a critical mass of people in an environment broad enough to be relevant, with similar challenges (e.g., climate, atolls). Solutions can be shared and scaled to better connect with similar groups globally.
Navigating Unknowns

Potential Unintended Consequences

- Being hijacked by self-interested individuals or groups or lack of community participation;
- Triggering an increase in conflict over land ownership and control;
- Exacerbate the digital divide between communities that have access to online fora and those that do not.

Thinking Ahead - strategies to avoid these consequences

- Support the development of facilitation skills by Indigenous peoples for Indigenous peoples,
- Use supportive, empowering structures and processes.
- Allocate resources to develop and support local facilitators to allow local communities to contribute from across the digital divide.
- Connected communities will support each other in understanding and resolving conflicts.
- Non-Indigenous allies and supporters will be vetted and undertake critical self-reflection before engaging with Indigenous communities.

We invite development partners to resource:

- A network of solutions labs and toolkits to connect communities
- Local solutions for local food system challenges incorporating Indigenous and non-Indigenous knowledge systems
- Local resource management solutions that play a key role in building resilience and responding to the climate and biodiversity emergency

Your investment has the potential to

- Elevate Indigenous food systems, unlocking their potential to play a stronger role in food system transformation contributing to environmental, social, and economic resilience
- Support inclusivity and equitable benefits throughout the global food system

What we need:

IT, training, resources, and locations to host the solutions labs, facilitators, project management team and tools, technical experts available for consultation, research and knowledge that is easily accessible.

For each of the four pilot solutions lab, we are seeking:

- $400-$600K to support the development and implementation for each local solutions lab over a 4 year period
- $75K - $100K (annually per pilot) for seed funding for prototype solutions developed to incentivise participation, demonstrate shorter term impact and provide feedback and lessons learned into the lab network.

Our solution hinges upon engaging development partners to promote Indigenous knowledge and food systems' powerful and natural resource management practices, and to support and act as an ally in voicing the rights of Indigenous peoples, and Indigenous food knowledge.

Together, we will pave a path to an equitable, sustainable food systems future.
Similar Solution in Action

**NIGERIA**

The Village Farmers Initiative in the Anam riverine communities of Nigeria initiated the production, processing and consumption of indigenous/native food varieties. This is to contribute to food security, bridge the demand and supply gap with digital financial inclusion, promote women and youth smallholder farmers and fishers and also promote enterprise and infrastructural development of the socially and economically disadvantaged communities.

**HAWAII**

The Molokai community created Sustainable Molokai to address various issues, especially food security. Its programs include establishing a mobile market to support small farmers in marketing their products, so farmers have more time to focus on the sustainable production-side while increasing market access. The mobile market gives the community access to nutrient dense foods, including traditional crops.

**CANADA**

Through a community consultative process, Muskoday First Nation in Canada improved its food security by building a bison herd, a traditional source of high quality protein, and by encouraging vegetable and fruit production at the household, school and community levels. The program is scaling up to use more of its farmlands, which it currently rents to non-Indigenous members, for local use, and to create employment opportunities.
LINKING COMMUNITIES BY SHARING TRADITIONAL & LOCALIZED KNOWLEDGE

Cohort Participation Countries
03: Feeding Children Nutritiously

Cohort Team Members: Generating Success for Farm to School Team (Gary Hoyer), Student Farming Around the World (Nadia Moukannni), ESCUELA (Luis Watanabe / Christian Wong), School Food Reconnected (Tim Björstrand, Tabi Joda and others), Eat Better Wa’ik (Bibi la Luz Gonzalez), Tetra Pak (Gustaf Frisk), University of the West of England (Mat Jones), Bites | Eat With Your Tribe (Roza Ferdowsmakan), Kikwetu Initiative (Mwendwa Emmaculate), Rural Enterprise Trust of Zimbabwe (Cuthbert Mukora), Kid’chen, Tunisia (Abrar N’houchi, Mohssen Bchir and others) VOICE Trust (Janet Preethi), Menus of Change University Research Collaborative (Jackie Bertoldo), Soydoy (Andrea Escobar). This Cohort was guided by Janina Peter
Our solution provides communities and children with a digital library of shared best practices on nutrition and an interactive virtual playground, offering engaging cultural knowledge, sustainable gardening practices, and lively gastronomical exchanges to lead intergenerational transformations, ensuring healthier children and more sustainable food systems.

The Need

To unlock the game-changing potential of creative initiatives and evaluated feeding programmes, we need to promote global exchange and mutual learning. We ask for technical and financial support to build a unique virtual landscape that facilitates this exchange and holds valuable resources, like a best practice interactive library, a matchmaking tool, an inspirational arena and a collection of applications and methods. To reach out and build a network of contributors and users, we will also seek to leverage the communication capacity of established partners.

Meal programs and food interventions can be effective in promoting health and wellness for children who will eventually become healthy adults. Combined with food literacy education, such programs and interventions hold the potential to transform local food systems towards a sustainable state, promoting both community health and locally-sourced sustainable food procurement.

Yet, in 2020, 73 million primary school children were in need of nutritious meals with many countries lacking effective, equitable, and universal food programmes for children. Food literacy is provided in national programmes and local initiatives, but on a global scale, it is still in a pioneering phase. These facts underline that our solution is urgently needed, to accelerate the transformation of childhood feeding.

The Solution

Our solution is to build an interactive digital library of shared best practices on nutrition and food systems and a virtual playground for communities, teachers, parents and children around the world. This virtual environment will offer knowledge-sharing and inspirational ideas and practices, to assist and inform all who are working to support and deliver to children fully funded, universal, nutritious, delicious, and culturally appropriate meals daily, using local, sustainably grown foods, at school or at home. Our virtual environment will inspire hands-on food education, managed by empowered community stakeholders. It will be a valuable tool to ensure efforts are well informed from the start, making them more effective, efficient, and beneficial.

You can find a draft version of our online environments’ homepage here: https://postfachtim.wixsite.com/my-site

We seek partners to help fund, build, manage, maintain the virtual environment, and disseminate the content. We believe it is an excellent way to make the vast amount of information and innovative ideas available, easy to access and utilize, with an impressive cost/benefit ratio.
Our solution will cause a global shift in perspectives about children’s nutrition, resulting from the tools we will be providing, and how children will be empowered to provide input and get support for their own ideas. Our solution will create awareness of the great programs and activities everyone can create by leveraging global best practices for food literacy, nutritional meals, agriculture, and community collaboration. Overall environmental awareness will increase due to improved practices in agronomy and food systems.

The Impact

In the short term, communities will start to design the first models informed by our network, this application will be the first fruits of their labor.

In the medium term, communities will increasingly use more of our knowledge-sharing tools to guide further development and implementation. With increased interaction, we will provide excellent support to solve problems and establish a solid line of communication and information sharing with communities.

In the long term, we will successfully integrate more self-sustaining communities with enhanced health, wellbeing, and sustainable food systems.
The purpose of our solution is to offer educators, parents, communities and children everywhere a virtual toolbox of resources and an interdisciplinary network of experts to support them in delivering sustainably produced, nutritious local food and high-quality food literacy education to children in their own community.
# Turning Barriers into Opportunities

## Systemic Barriers

<table>
<thead>
<tr>
<th>Systemic Change Opportunities</th>
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<tbody>
<tr>
<td>• Provide best practices adapted to specific regions and cultural contexts, accessible through map browsing function; provide multilingual material and integrate translation tools into the virtual library.</td>
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<tr>
<td>• Adapt the virtual environment for access via mobile phones; consider a print version (handbook) of the best practice collection (possibly adapted to regions) to send to interested individuals and organizations.</td>
</tr>
<tr>
<td>• Include best practices and resources, adapted to target specific problems that hinder healthy childhood nutrition (e.g. breastfeeding taboo).</td>
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</tbody>
</table>

## Different countries scenarios:

We are based in high, middle and low income countries, with different cultural, gender and rural/urban realities. When our solution is to be implemented globally it will have to meet those different realities. For example, in some areas high speed internet connections are available, whereas other areas might lack internet infrastructure entirely. Also, values connected to the feeding of children differ widely (e.g. breastfeeding).

## Lasting partnerships and funding:

Long-term partnerships are essential to fully integrate our programs and make impact globally. We need a specific, stable team to run and maintain the virtual environment, and partners for outreach, funding and content contribution. Finding these partners, who will fully support and back us is a major roadblock to overcome.

## Strong presence of unhealthy, ultra-processed foods:

Our solution aims to enhance healthy childhood nutrition through improvements in school feeding and other public meal settings and through the support of community members in adopting healthy, sustainable feeding options. In all these settings, persistent unhealthy eating habits might pose a barrier, because of unaware parenting, children naivety, marketing impact, time and cost constraints, and established good feeding values.

## Efficient and determined implementation in order to keep the people and resources (connected to our cohort) onboard to constitute a stable team.

## Use the great opportunities of the Food Systems Game Changers Lab to find partners for scaling and long-term cooperation. Resort to these partners and the cohort members’ networks to spread knowledge of the solution and to find contributors.

## Create relations with policy makers and other influential community members in the field of school/childhood nutrition and convince them to act as partners and local ambassadors for our solution and virtual environment.

## Provide best practices for the cooperation with food retailers within local networks to make healthy food choices more available

## Embrace food literacy education as a way to connect children to ancient cultural knowledge, cooking techniques, local agriculture, health benefits of food etc, enabling them to make informed decisions; provide food literacy resources in our virtual library.
Navigating Unknowns

Potential Unintended Consequences

Writing best practice documents and engaging in networking could lead to less “time on the ground” among those who work for nutritious and sustainable feeding of children.

Decline in innovation due to group-think, inertia and clique development.

The planned “playground area” ("yummy hub"), where children can have their say and document their food experiences and ideas, might be misused by adults for cyber grooming, scamming, phishing and other internet crimes.

Among those facilitating existing (national) websites / networks on child- and school feeding, our virtual environment might be considered a “rival in business” which might reduce their willingness to contribute to our global network.

Thinking Ahead - strategies to avoid these consequences

Provide a standard form for best practices with guiding questions that will ensure time-efficient documentation, offer support from the network.

Rotate lead curators, competitions and gamification.

- Require users of the playground to authenticate their identity when accessing the playground.
- No direct messaging between users (no private chat rooms, where such things would have the most potential for happening.)
- Screen what gets posted and take down inappropriate content, using AI that tags keywords. Other users will also be able to flag inappropriate content and cause it to become hidden until it is addressed by us on the backend of the system.

Establish communication and partnerships with those platforms and networks early in the implementation process.
Similar Solution in Action

**Food for Life** (UK) worked with 4000 schools to showcase grass-roots whole settings action on children’s nutrition, sustainable food systems and food literacy. Research shows accredited schools increased fruit-and-veg uptake; enhanced cooking skills; £1:3 return on investment. The scheme was adopted by **SZS**, Czech Republic, LOMA (Denmark) and mapped to school food practices in Southeast Asia. These initiatives are increasingly digitally peer-led, such as our cohort member’s own chef-to-classroom mobile app called **Bites | Eat With Your Tribe**. This app serves as a food literacy and food experiences tool for classrooms. Teachers use this app to bring cooks and chefs into classrooms for interactive lunches with children. Use of the app fully funds food gardens on school grounds for the benefit of school children. Also, the Social Gastronomy Movement provides a map of actors engaging in food education at all levels.

We are looking for partners to help with:

1. Funding
2. Website Support
   - Technical, and graphic design expertise to build, manage and maintain the website
   - Knowledge of and accessibility to content providers, content, and end users both for start-up and ongoing service
   - Marketing to promote the website
CHILD FEEDING NETWORKS TO ADVANCE FOOD SYSTEMS REVOLUTION

Cohort Participation Countries

bites.
www.bites.mobi

ESCUELA
Education Antimondial

RURAL ENTERPRISE TRUST OF ZAMBIA
Organising Committee for Zambia

Tetra Pak

Makalu

Right2Grow

Kids in Nutrition

UWE Bristol
University of the West of England

MCURC
THE MENUS OF CHANGE
UNIVERSITY RESEARCH COLLABORATIVE

Global Student Farm Symposium

Global Education 2030, 2020-2021
04: Upcycling Food and Materials

Cohort Team Members: Simoun Rainier Bayudan, TripleVs Venture (Dr. Chian Wen Chan), Livestock Water Recycling (Karen Schuett), Ressect (Proscovia Alando), Biovert Protein Co.,Ltd (Peter Hamilton), Savannah Health Innovation System Limited (Dr Samson Agboola, Engr Dalhatu, Muhammad Musa, Innocent Ujata), AgriBiz Home (Gwangwa’a Priestley Pride Tabi). This Cohort was guided by Mihir Pershad.
Food waste is at large - roughly amounting to $1 trillion of losses every year. However, many lack awareness of the hidden value in food waste and when upcycled, they become reusable inputs for a variety of products. This is where we come in - circularity is the heart of our solution.

The Need

According to the Food and Agriculture Organization, every year, around one-third of all globally produced food goes to waste. This is equal to 1.3 billion tons of fruits, vegetables, meat, dairy, seafood, and grains that either never leave the farm, get lost, spoiled, or discarded during distribution. In fact, the amount of food waste can cover enough calories to feed every undernourished person on the planet. Instead, it produces 3.3 gigatons CO2 eq or 8% of global greenhouse gas (GHG) emissions into the environment.

The Solution

Our solution proposes to help diverse stakeholders such as craft professionals, hobbyists, artists, makers, entrepreneurs, industries and consumers transition towards a circular economy. We see upcycling as a targeted intervention process that slows, closes, narrows, and regenerates resource loops, by designing out waste, and keeping resources in use for as long as possible, to then cycle them back into production processes. However, to accelerate and scale this transition requires incentives for upcycling businesses, design initiatives, and research and curriculum enrichment in upcycling technology.

Our motto is to “transition waste to circular resources”, and until zero waste exists globally, then upcycling learning centers of excellence across different global regions that leverage a metaverse platform should be established to share best practices and build capacity. We want to create a movement centered on food waste upcycling that will support related efforts.
The Impact

If implemented as intended, we would see a fully circular economy characterized by zero waste going into landfills and minimal use of virgin materials. For this to be sustainable over the long term, products and resources at their end of life must change to be recycled to a quality equal or greater than the original product.

By adding value to products at their end of life, upcycling closes resource loops in a way that ensures the same resources can continue along with these loops indefinitely. This also reduces the need for new material inputs since using these new inputs further propagates exhaustive extraction of raw materials. Moreover, upcycling improves resource efficiency and therefore ultimately reduces carbon emissions related to materials and energy consumption.

Our solution also enables businesses to deliver short and medium term outcomes that contribute to the United Nations Sustainable Development Goal 12 on responsible consumption and production. Therefore, upcycling can drive the transition from a linear economy towards a circular economy with benefits for local people and the environment while increasing the resiliency of the local economy in times of global financial instability.
Turning Barriers into Opportunities

**Systemic Barriers**
Systemic Change Opportunities

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**The development of upcycling technology continues to be extremely slow to evolve** Information on product design, production and the required technical skills for upcycling waste into products that satisfy customer expectations is still lacking. Most manufactured products are also not designed to be re-purposed at the end of their product life, or have by-products from the process re-used as input into another product. This makes it difficult to capture value from waste.

**An erratic supply chain.** By and large, most waste is poorly segregated for collection and ends up going into the world’s landfills, rivers and oceans. Another supply challenge is obtaining adequate volumes of consistent quality waste for upcycling.

**Laws and regulations that unintentionally incentivize wasteful behavior.** For example, expiration date labels, while protecting the consumer, don’t account for differences in how food is stored. The date label on eggs may be labeled for pantry storage, but will last longer when refrigerated. Some shelf-life labels are often misunderstood to mean food is no longer edible, when in reality they’re still safe to eat but may not meet the manufacturer’s quality standards.

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To take upcycling technology to the next level up, a key step change is for technical design learning to include diverse design methods as well as material practices that engage upcycling entrepreneurs. It is important that entrepreneurs have the basic foundations on understanding material use, condition, lifecycle, and consumer behaviors. Experimental design based on consumer research along with prototype testing and analysis can then follow to make the necessary iterative design changes and to find the minimum viable product acceptable to consumers.

One method of mitigating the unpredictability and correct segregation of waste resource streams is for businesses to form Industry-Ecology partnerships where one company’s by-products are sold directly to another organization for upcycling in a collaborative and mutually beneficial agreement. Partnerships with large-scale companies help in securing steady quantities of waste with adequate quality. Another step is to promote the use of reverse logistics for transport companies.

To better inform laws and regulations on upcycling, a key step we can take is to provide support for waste upcycling education, endorsements, and resource hubs. Another step is to implement better mobilization of resources and knowledge, to optimize any freely available material along with any bio-inspired procedures.
Navigating Unknowns

Potential Unintended Consequences

While supporting food waste upcycling is gaining traction, there are some unintended consequences which may occur, namely:

- Stimulating competing interests for nutrient recovery as an energy source rather than for upcycled material production
- Locking into directions that exacerbate power dependencies (e.g., cartels), extending the gap in progress between high and low-income countries, leading to rebound effects, or falling short in terms of actions required for strong sustainability.
- Incurring potential violations of Human Rights, Labor, Environment, or Anti-Corruption policies
- Having a positive impact on one set of SDG’s while affecting other SDG’s negatively

In a way, excessive intensification of upcycling food waste efforts can exhaust the advocacy and the principles behind it. Stakeholders may become more engrossed with food waste, that the original mission of promoting sustainable consumption for the environment becomes lost and overlooked.

Thinking Ahead - strategies to avoid these consequences

To lessen these risks, systems thinking analysis tools can be applied, such as the 3-Horizons Framework, Unintended Consequences, Futures Wheel, STEEP(LE) and Edge-Making. An analysis of Systems Leadership along with Systems Measurement and Evaluation of our solution can also be employed to ensure actions are kept on the right path.
We’re interested to work with partners who have the resources, credibility and shared vision to implement business models that transition us back to operating within planetary boundaries. We aim to have a long term partnership to change mindsets and influence consumer behavior towards the concept of waste to circular resources.

**We’re seeking long term partnerships with organizations who have:**

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<thead>
<tr>
<th><strong>SHARED GOALS</strong></th>
<th><strong>INTERDEPENDENCE</strong></th>
<th><strong>ACCOUNTABILITY</strong></th>
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<tr>
<td>Aligned meaning and purpose</td>
<td>Complementary and synergistic work</td>
<td>Take responsibility for commitments</td>
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<tr>
<th><strong>INTEGRITY</strong></th>
<th><strong>COMMITMENT WITH RESOURCES</strong></th>
<th><strong>AUTHENTIC COMMUNICATION</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sincere and Empathetic behavior</td>
<td>Time, Financing, Accessibility</td>
<td>Open, Honest, Flexible</td>
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Although upcycling can be practiced using simple tools and skills, the production of long life, high quality upcycled products that consumers find convenient to use requires special skills and equipment.

We’re looking for partners that work across different cultures and time-zones with ecosystem participants from diverse backgrounds, that can provide access to advanced upcycling technology. They can also facilitate connections to nature based scientific design organizations, and that can provide introductions to potential investment partners interested in co-designing and implementing our solution at scale.
Similar Solutions in Action

Case studies pertaining to several upcycling/circular economy initiatives across the world

1. **Full Harvest x Danone’s “Good Save” Greek Yogurt.** Creation of an innovative and award winning product from rescued produce.

2. **Livestock Water Recycling** to create fertilizer and clean water from manure and milk. Processing waste at Lebanon’s largest dairy farm, allowing crop growth where there never was any before.

3. **Fabricating T-Shirts from Milk Waste.**

4. **The Sharing Economy of Amsterdam.** Amsterdam promotes different platforms where citizens can “share” their resources, be it through material goods, food, etc. through a bottom-up approach.

5. **Rethinking the Fashion Industry.** Launching the “Make Fashion Circular” initiative to bring together all stakeholders involved in the fashion industry.

6. **The ICARRE 95 Project with Renault.** Promotion of upcycling and revalorizing used products by a large international automobile brand.
Cohort Participation Countries

TRANSITION WASTE TO CIRCULAR RESOURCES
05: Reducing Food Loss and Waste

Cohort Team Members: Institute for Development Impact (I4DI) (Adeyinka Meduoye, Abdulhaffiz Umar, Ochanya Adah), Nita Lakhani and Sylvia Szskudlarek (healthcare designers), White Pony Express (Tim Letzkus), The Sustainability Consortium (Jennifer Park), Research Consortium led by University of California, Davis, USA (Peetambar Dahal, Mehnath Dhimal, Kent J. Bradford and others), AGPharm Bioinnovations LLP (Sanjai Saxena), Emadini (Izegbuwa Izebaye), Shumbakadzi (Blessing Machiya), Savannah Health System Innovation (Suzzy Niyang, Confidence Oigoga), Scholars of Sustenance Foundation-Thailand (Naphat Phongpheat), Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) (Emmanuel Okalany and Florence Nakaiwa Mayega), Under the Microscope (Stephanie Okeyo), Jorge Luis Siesquén Deza, Claudia Siesquén. This Cohort was guided by Simona Grande.
For developing countries, we aim to minimize post-harvest food loss by scaling existing and developing food preservation technologies through entrepreneurship, and sharing resources and knowledge.

For developed countries, we aim to minimize food waste at the retail level by scaling existing and creating new legislation, regulations and policies, which will incentivize reducing food waste.

We aim to equitably distribute knowledge and resources globally by implementing cold and dry chain best practices, and increasing food access through food banks and food rescue operations, which will in-turn reduce Greenhouse Gas (GHG) emissions by up to 70 gigatons a year.

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The Need

In developing countries, more than 40% of the food losses are post-harvest losses while 50% of food is wasted at retail and consumer levels in developed countries. At the same time, 600 million people go hungry in both developed and developing countries because they have no access to the very food that is lost or wasted. There is a need to minimize food loss and waste to feed a growing global population with safe and nutritious food, while reducing environmental impacts and enhancing livelihood and health.

The Solution

We propose to use systemic change to reduce loss and waste along the food chain. We will reconnect all parts of the food supply chain (production, manufacturing/distribution, and retail) through supply chain preservation improvements in developing countries and expanding food recovery operations in developed countries.

Food loss and waste can be transformed by adopting current eco-friendly policies, scaling existing post-harvest best storage and transportation interventions (e.g., cold/dry chain), and by creating equitable distribution of lost and wasted food (e.g., via food recovery).

Our solution focuses on a Now not New concept. We do not need to invent new technologies and processes because they already exist to solve the hunger problem; we need to deploy them.

The solution works because the major challenge in food loss and waste is not one of supply, but one of distribution.
The Impact

Partnerships among food system actors will promote formulation of new eco-friendly legislation & regulation, create incentives to balance resources, share knowledge & best practices, and change consumption patterns that encourage food loss & waste and compromise human health.

We will know the solution is effective when we see similar legislation incentivizing food recovery throughout the developed world, and infusion of new investment and adoption of supply chain preservation processes in the developing world. Other expected changes include data collection around food recovery in communities, and education programs around food preservation best practices for small-holder farmers in the developing world.

We expect legislation and policy to change in the developed world, making food recovery a priority. In the developing world, we expect investment in supply chain preservation processes to minimize food loss. Our solution is predicated on a Now not New concept, so our steps are focused on implementing existing solutions for food loss and waste.

The solution moves the current diverse and unconnected food supply chain to an interconnected, holistic system that redistributes food and food processes equitably across the globe, using current technology and processes.
The purpose of our solution is to transform global food systems for the benefit of people, planet, and prosperity by minimizing food loss and waste through scaling and implementation of food supply chain preservation systems, food rescue programs, and national “zero food waste” policies. The solution moves the current diverse and unconnected food supply chain to an interconnected, holistic system that redistributes food and food processes equitably across the globe, using current technology and processes.

It focuses on now not new.
Turning Barriers into Opportunities

Environment: Lack of environmental policies such as food waste policies that promote waste prevention and food donation, restrict food from going to landfills and prevent unnecessary food production. A lack of resources (funds, education, appropriate technology) and incentives that tackle the thought processes and systems behind food waste and provide transparency and traceability in the food supply chain to minimize food loss and waste.

Livelihoods: There is inequitable distribution of resources and incentives between developed and developing economies. Abundant resources and infrastructure in developed countries are not easily shared with developing countries due to unique geographical, political and economic environments. Food losses developing from this in developing countries during harvest and in storage translate into lost income for small holder farmers and into higher prices for poor consumers.

Human Health: Current food systems with long and deregulated global commodity supply chains make it difficult to place quality monitoring checks that ensure food does not get spoiled in processing, distribution and retail. Current food consumption and distribution patterns prevent access to healthy food and encourage unhealthy food choices, which compromise human health.

- Create global policy, backed by the UN, to secure interest and investment and possible partnership in food waste and loss prevention; Lobby for national policy creation and implementation to mobilize resources for food rescue/diversion efforts.
- Identify specific policy and infrastructure needs and engineer partnerships with scaling partners and government organizations for cross-sector collaboration to reduce negative environmental impacts.
- Co-create a global plan taking into account different economies and roles to offset negative environmental impacts of loss and waste.

- Review infrastructure needs and devise a sustainable approach to aid people in countries to acquire needed infrastructure
- Build a matchmaking platform to provide secure and equitable access to technology, knowledge sharing, farmers’ training, data, financial services, and market opportunities across the food chain

- Standardize food dating and update or eliminate outdated nutrition guidelines
- Invest in and implement food safety monitoring systems per CODEX standards to reduce toxins
- Develop programs to educate producers, retailers, and consumers that promote consumption of nutritious foods, improving health outcomes through various behavioral change and structural strategies
Navigating Ununknowns

Potential Unintended Consequences

Reductions in food waste could negatively impact food rescue programs and organizations.

Saving upstream food loss at the supply chain level might increase food waste at the retail and/or consumer levels.

Thinking Ahead - strategies to avoid these consequences

Involving food rescue organizations in co-creating solutions that may be mutually beneficial. For example, food rescue partnered with retailers committed to minimizing food waste across jurisdictional networks.

Test food loss supply chain preservation solutions on a smaller scale for upstream/downstream effects and iterate on these to maximize benefits across the food supply chain once these are brought to scale.

Our solution needs partnerships between national and local governments, NGOs, and philanthropists; but most importantly in the developed world, we need support from non-profit organizations and/or governments who have already laid the groundwork and are currently developing solutions towards global food recovery.

From scaling partners, we need the capacity and investment to expand supply chain preservation processes within the developing world, as well as public-private partnerships to develop policies towards scaling food recovery in the developed world.
Similar Solutions in Action

**Example of successful technology:**

Dry Chain technologies minimize post-harvest food loss through triple action on reducing the impacts of insects, toxic molds, and nutrient loss, thereby improving food safety and maximizing nutrition. See links below.

1. Solar-based cooling
2. Purdue Improved Crop Storage
3. Ecofriendly solar drying tools
4. Drying beads

**Examples of successful programs:**

Food rescue programs source and distribute food waste at the retail level to communities and non-profit organizations in need of food. See links below.

1. White Pony Express in the U.S.
2. Scholars of Sustenance in Thailand and Indonesia

**Examples of national policies that incentivize reducing food waste include:** See links below.

1. South Korea’s policy on Food Waste
2. Italy’s policy for donation and distribution of food and pharmaceuticals
SOLUTIONS EXIST; WE JUST NEED TO DEPLOY THEM.
06: Developing Food Systems Leaders

Cohort Team Members: African Food Fellowship (Joost Guijt, Alex Rees), IFSTAL (Rosina Borrelli, Louise Whatford and others), The Regeneration Fellowship (Hannes Van den Eeckhout), 50by40 Southern Leaders Fellowship Programme - Indian Subcontinent (Pavitra Krishnan), RENERGii Ventures (Nikolas DeCesare), Alliance for Food and Climate Systems Transformation/MIT Water & Food Systems Lab (Greg Sixt). This Cohort was guided by Ivani Pauli
The world urgently needs food systems thinkers.

Our solution addresses the urgent need for developing new ways to identify, empower, and promote new and existing leaders committed to food systems change. These leaders may already be active at local to global levels, and need the support and framework to be able to shape local and national agendas, investments, policies and regulations known to work for better food systems.

The Need

The global food system is intricate, interconnected and deeply complex. We need to transform the global food system to deliver environmental sustainability, food and nutrition security, good health and welfare, and inclusive livelihoods.

Achieving timely and transformational change needs effective systems leadership that embraces and works with the complexity inherent to food systems in order to implement and see through systemic interventions, investments and innovations. They aim to make our food systems more resilient, inclusive, interconnected, and (bio)diverse.

Key leaders include actors who set the agendas, lead implementations and are accountable to promised change. They are found in national governments, funding organizations, research organizations, social entrepreneurs and other food system stakeholder groups that enact change every day. Their leadership is necessary to shape the direction and pace of change in the environment, society, economy and critical institutions. We plan to give these food system leaders a strong foundation of insights to work with and the influence necessary to drive change. As a complex array of food system actors are needed to deliver systemic outcomes, food system leaders need to know how to work with them to catalyse transformation from within.

The Solution

Our solution strengthens food systems leadership and collaboratively discovers transformation pathways through building capacity for systems thinking and leadership skills. We work with scaling partners through processes that serve the needs of the leaders who must set priorities and lead implementation.

1. Creation of space, support and structure
2. Science-based assessment of vulnerabilities
3. Articulation of systemic barriers and opportunities
4. Scaling and implementation of proposed solutions
5. Iterative learning on solutions
The Solution

1. **Creation of space, support and structure** for food systems thinking across the whole food system; this could include training in food systems thinking and leadership skills, or identifying policy or structures to aid this.

2. **Science-based assessment of vulnerabilities** in the food system of focus (e.g. future climate change impacts to production systems) to develop an objective picture of the current food system using a combination of modelling, literature review, key informant interviews, and focus groups.

3. **Articulation of systemic barriers and opportunities** for solutions identification of scaling and implementation pathways. In this stakeholder-driven process workshops, interviews, and surveys are used to map out stakeholder needs, values, goals and where system barriers exist (e.g. at the ministerial level or poor infrastructure). Through this process, a complete set of stakeholders relevant to the problem are identified and partnerships and collaborations are initiated.

4. **Scaling and implementation of proposed solutions**. Multi-stakeholder collaborations are developed based on findings from the previous steps. An important approach to scaling is to invest in thematically and/or geographically specific leadership initiatives, such as social entrepreneurship in food and ag.

5. **Iterative learning on solutions**. M&E experts work in partnership with the multi-stakeholder teams to conduct a participatory assessment of the impact of the solutions and collectively formulate recommendations when appropriate.
The Impact

Our solution provides the skills and basis to bring together expertise across all the food system arenas and allows space for negotiation and learning from different areas of the system. This will quickly strengthen and open up communication streams where there wasn’t before and help to break siloed thinking which will pave the way to help identify areas of food system outcome transformation to move forward together to a more sustainable and healthy future.

The recent pandemic has further highlighted the fragility of both local and global food systems and the need for transformative change. What also became apparent during the recent COVID-19 pandemic is that the reactions and mitigation measures taken by food system actors can actually cause further, and sometimes greater, impacts than the perceived issue the measures were tackling.

This demonstrates the interconnectedness of the system and the need to not only take this into consideration but also the need for inclusivity. More collaborative and participatory approaches that allow all the stakeholders viewpoints to be taken into consideration will allow for critical changes to tackle medium and long term international issues like climate change and trade, while mitigating unintended consequences occurring and creating ownership and accountability throughout the system for sustainable change.
### Turning Barriers into Opportunities

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<th>Systemic Change Opportunities</th>
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<td><strong>Siloed and disconnected system dimensions</strong>: need support for developing key leadership skills and networking and leaders that connect across systems dimensions and embodies the importance of systems thinking.</td>
<td>We propose addressing this barrier through <strong>platforms for training and knowledge sharing</strong>, by offering food system skills and by enabling successful <strong>connections</strong> between actors, for example a networking hub that connects a broad swath of food system actors and leaders together, moderated by trainers who can facilitate.</td>
</tr>
<tr>
<td><strong>A disabling environment</strong>: a lack of funding for long-term systems-oriented solutions, power imbalances between global and local food systems, and conflicting mindsets/worldviews (e.g. technology vs. agroecology)</td>
<td>The 3-5 year funding cycles of donors and typical policy cycles do not <strong>favour long-term, intergenerational systems transformation</strong>. Longer-term commitments would facilitate the development of food systems skills and thinking, tackle power imbalances and support networking among stakeholders. This will be tackled by continued <strong>donor and investor systems thinking education</strong>, addressing the incumbent funding and subsidies regimes that strictly favour technology or capital investments for engineered solutions over other solutions like insurance, ecological outcomes (biodiversity, ecosystem services, soil building, etc.) that have similar positive benefits. As most context-specific, proof-based examples arrive that support this broader view of inclusive <strong>financial solutions</strong>.</td>
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<tr>
<td><strong>Incomplete and uncoordinated food system governance</strong>: currently there is a lack of infrastructure (physical, financial and educational) as well as an equitable representation for all stakeholders and a lack of a shared vision for what the future of our food systems must become.</td>
<td>We suggest strengthening the CFS (UN Committee on Food Security) as the <strong>global democratic space for food governance</strong> and aligning with the recommendations of its HLPE (High Level Panel of Experts). We also recommend the development of <strong>shared visions for desired food systems futures</strong> captured in national food systems agendas. Such agendas would prevent conflicting policies and align investments and other interventions.</td>
</tr>
</tbody>
</table>
Navigating Unknowns

Potential Unintended Consequences

- Creating or shifting power imbalances
- Perpetuated dominance of perceived experts in food system processes
- Creating perceived improvement of democratic and representative food system governance
- Leadership washing: the training approach becomes a checkbox and business as usual continues

Thinking Ahead - strategies to avoid these consequences

Our Food System thinking approach, with a sound scientific basis, and networking should contravene these risks.

Call to Scaling Partners

This Action Agenda needs scaling partners who are influential in local to national food system governance and want to give attention to the necessary role of leadership in new governance practices.

It also needs funders who are willing to invest in the three layers of our solution: leadership support, leadership structures and individual leadership initiatives.

Implementing partners who can work from independent means with us in providing our solutions, are necessary to help make sure strong food system leadership can grow to a scale that has impact. We seek partners and funders who together would make it possible to work at all three levels in one or more countries.
Similar Solutions in Action

**African Food Fellowship**: a practical and visionary food systems leadership support initiative targeting emerging leaders from the civic, public and private circles. Started in Kenya and Rwanda, it has the backing and ambition to scale across Africa.

**Food and Climate Systems Transformation (FACT) Alliance**: is a global research coalition that provides a bridge between on-the-ground stakeholders, researchers and innovators to drive solutions-focused research to fill critical food systems knowledge gaps and strengthen the link between research and action.

**IFSTAL**: a successful global programme in its seventh year, equipping professionals with critical interdisciplinary systems thinking skills to address issues of long-term food security. Proof of concept is evidenced by 2000 participants; many now in key government, UN, NGO and private sector roles.

**The Regeneration Fellowship**: aims to build a worldwide start-up studio programme to develop inclusive business ideas in regenerative agriculture and food. Based on local partners’ networks and thorough food systems analysis, The Regeneration Fellowship will build strong teams around key solutions and foster steward-owned businesses to change the way our food companies are owned, managed and financed.

**The Southern Leaders Fellowship Programme**, aims to address critical social justice and sustainability issues within food systems through an innovative, 12 month global mentorship program that trains young advocates to achieve the goal of transforming the food system into one that is fairer, healthier and regenerative. The fellowship aims to start a pilot in the Indian subcontinent and is currently looking for funding.

**RENERGii Ventures**: a food and agtech-focused venture studio mobilizing a new generation of food system entrepreneurs in South-East Asia. The portfolio spans alternative protein, insect protein, MSME food enablement and urban farming, with the goal of driving innovation across Asia’s food systems and urban communities.
DIVERSE, REPRESENTATIVE, & RENEWED LEADERSHIP TO DRIVE TRANSFORMATION
Cohort Team Members: Myanmar Innovative Life Sciences (MILS) (Kyaw Thu Htet), Nomoo Foods (Henry Zhang), SimSuFoodS (Andreas Gundberg), Belli (Bryan Wong), Taste Like (Emily VanderMey), The Bug Picture (Laura Stanford), Crickethouse (Mandy Nolan), Sophie's Bionutrients (Eugene Wang, Kirin Tsuei), Theodosia Awinimi Apibil. This Cohort was guided by Mihir Pershad
The sustainable alternative protein revolution is being fueled by bold innovations globally. As rapidly growing systems need sturdier guidance, this solution recommends key actionable steps for stakeholders in the alternative protein value chain to effectively coordinate between regulatory, investment and R&D landscapes to have long-term sustainability and consumer acceptance.

### The Need

Humankind, in the past two centuries, have pursued segregated actions for food production and realized the recklessness only when system level negative impacts such as climate change occurred.

To achieve the intended systemic change, collaborative support from all stakeholders, especially scale-up partners, is needed. Below are the four essential components needed by the solution to effectively catalyze the holistic development of the alternative protein industry:

1. **Harmonizing regulatory frameworks** containing guiding policies to support the development of alternative protein value chains and to appropriately price the sustainable alternative proteins. Establish global and national standards for the calculation of GHG emissions from different protein sources.
2. **Strengthening R&D frameworks** to improve the taste, texture and nutritional aspects of the alternative protein products by technological intervention, to scientifically investigate the impact of alternative proteins on the health of consumers.
3. **Enabling financial environments** to support the production of sustainable alternative proteins with government-backed, low-interest infrastructural loans, private and institutional investors with higher risk appetite and other financial incentives such as tax credits to speed up the development of the alternative protein industry.
4. **Boosting consumer education and awareness** through government endorsements to enhance public acceptability.

### The Solution

Key actionable steps the solution is proposing are:

1. Governments to act as leading adopter and educator by committing to an increased usage of sustainable alternative proteins in public servings and to back low interest loans and tax incentives for sustainable alternative protein production and infrastructure expansion.
2. Streamline the current regulatory framework to have better control and standardization mechanisms for the accelerating alternative protein innovations.
3. Strengthen existing R&D frameworks by including life cycle analysis of animal and alternative proteins, expanding food safety research and other R&D activities to design climate labeling, new carbon tax model and publicly accessible database.
4. Scaling partners to enable and support entrepreneurs to innovate new supply chain models for introduction of new sources of raw materials such as inclusive models to include small-holder farmers.
5. Encourage existing major private sector players in the alternative protein industry to work together with budding entrepreneurs, in key areas such as R&D, to enhance their value proposition, streamline the supply-chain and make their business more sustainable.
The Impact

**Strengthened industry development:** The alternative protein industry will develop more rapidly if regulatory bodies, financial institutions, and companies work together.

**Increased resource efficiency:** Decreasing the consumption of animal products would also increase resource efficiency when it comes to raw material, water usage and consumables which is necessary in order to secure food availability for humanity on a long term perspective. It will also reduce the risk of deforestation and local water shortages in drought areas.

**Reduced emissions:** Global greenhouse emissions meat and dairy products results in GHG emissions of more than 5 gigatons of CO2e per year. A decreased consumption of animal proteins in favor to higher consumption of sustainable alternative proteins would substantially lower the global GHG emissions.

**Improved consumer acceptance:** Persuading consumers of the health and environmental benefits of eating alternative proteins would be an important step in increasing alternative protein production. A decreased consumption of meat and dairy products would also according to numerous scientific publications result in improved health when it comes to cardiac disease, obesity, cancer, etc.
25% of total Global greenhouse (GHG) emissions are from food consumption and about 50% of that is correlated to our consumption of meat, fish and dairy products (Poore, J., & Nemecek, T. 2018). A decreased consumption of animal proteins and higher consumption of sustainable alternative proteins would substantially lower global GHG emissions.
### Turning Barriers into Opportunities

**Slow scale-up:** Significant barriers are hindering the sizable scale-up of alternative protein production to increase the production volume to effectively reduce the consumption of animal proteins with competitive prices. As new production methods need new infrastructures, they are not yet positioned to compete with animal protein. Weaker R&D and financing supports are also key factors creating this sluggish scale-up, as well as supply chain gaps for end product manufacturers to connect to adequate sources of raw materials.

<table>
<thead>
<tr>
<th>Systemic Barriers</th>
<th>Systemic Change Opportunities</th>
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<tbody>
<tr>
<td>Low interest loans &amp; tax incentives for alternative protein production &amp; infrastructure</td>
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<tr>
<td>Financial incentives for sustainable alternative protein innovation</td>
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<tr>
<td>Bioengineers and technical resources to investigate sustainable alternative proteins and demonstrate their nutritional properties</td>
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<tr>
<td>Joint scientific papers showing the advantages compared to animal protein</td>
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<tr>
<td>Communication with small holder farmers to increase productivity</td>
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<tr>
<td>Commitments from governments worldwide to serve 25% of all public servings of protein coming from alternative sources by 2030</td>
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<tr>
<td>Internal education campaigns</td>
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<tr>
<td>Globally recognizable social media platform or interactive resource to spread health information</td>
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<tr>
<td>Consumer-facing food label standard</td>
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<tr>
<td>Graphic-based climate information and clarity/transparency into detectable inputs into products</td>
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<tr>
<td>Techno-economic and/or life cycle analysis of animal and alternative proteins by government or independent third party to define resource use profile</td>
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<tr>
<td>Climate labeling and carbon taxes</td>
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<tr>
<td>Clear definition on whether or not alternative protein can use the name “dairy”, &quot;meat&quot;, etc.</td>
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<tr>
<td>Regulations for animal farms to list chemicals used on animals as part of the labeling requirements so that alternative proteins can compete on an equal platform</td>
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</table>

**Low consumer acceptance:** There is also a need for consumer education regarding sustainable alternative proteins when it comes to both health and usage. In developed countries meat, fish and dairy is a natural thing in people’s eating habits and in developing countries meat is a class issue. To change this there is a huge need for consumer education through the right ambassadors etc.

**Unprepared regulatory frameworks:** Changes will not happen without appropriate global regulations, both regarding labeling and food security aspects concerning sustainable alternative proteins but also to promote sustainable alternative proteins against meat and dairy products causing so much more climate and environment impact.
Navigating Unknowns

Potential Unintended Consequences

- The labeling and regulatory process may take years
- Lack of political will or strategy to execute the solution
- Producers may push back on global baseline emissions if they believe their production method is better
- Consumer label standards may become too strict or too lenient
- Pricing meat to include externalities may increase financial burden on consumers

Thinking Ahead - strategies to avoid these consequences

- Prioritize countries with a sense of urgency or who see protein security as critical issue
- Organize a high-level collaboration to create support (like IPCC)
- Allow producers to conduct objective testing to compare their emissions to the baseline emissions established by regulatory bodies
- Make product testing less cost-prohibitive can align consumer, company, and regulatory incentives
- Providing a lower cost alternative to animal products, such as alternative proteins

The shift towards sustainable alternative proteins opens up huge opportunities for new and established industries and stakeholders:

**PARTNERSHIPS:**

We are promoting open, transparent, and strategic partnerships with regulators, investors, NGOs, CPG producers, and entrepreneurs to adopt aspects of our solution within their own government or business and maintain long-term relationships.

**FUNDING:**

We encourage individual and institutional investors with patient capital and impact-driven motivations, as well as government-funded, low interest loans and subsidies.

**CAPACITY:**

We expect to enhance the technical capabilities of the industry through R&D, infrastructure growth, and a streamlined supply chain.
Similar Solutions in Action

Earlier this year, the city of Helsinki in Finland decided to halve their consumption of meat and dairy products in public servings by 2025 in order to reach their CO2 budget.

Berlin’s university canteens go almost meat-free as students prioritise climate. The 34 canteens and cafes catering to Berlin’s sizable student population at four different universities will offer from October a menu that is 68% vegan, 28% vegetarian, and 2% fish-based, with a single meat option offered four days a week.

Nestlé’s plant-based sales grew 40% in just six months during the coronavirus crisis, which has sent consumers opting for meatless groceries more than ever before. Earlier this year, the conglomerate ramped up its plant-based innovation in response to rising consumer demand.
NURTURING THE COEXISTENCE BETWEEN MEAT & ALTERNATIVE PROTEINS
Cohort Team Members: AT HAUSE (Ashiraf Kyabainze), Revolution Inc. (WeUse) (Mitch Barlas), Fitware LLC (Marjorie Weir), Chandra Associates (Shubham Chandra). This Cohort was guided by Albert Kure
The Need

Based upon estimates by FAO, around 1/3 of the world’s food is wasted annually. The 2030 Agenda reflects the increased global awareness of the problem and calls for halving per capita global food waste at retail and consumer levels by 2030, as well as reducing food losses along the supply chains.

Additionally, single-use packaging is currently the single largest contributor to landfills in the USA, at 90 million tons. Across the globe the livelihoods of smallholder farmers and their families continue to lose revenue due to factors such as climate change, pests/mold, the increasing number of middlemen in the supply chain, and the increasing costs associated with packaging.

The Solution

We have developed a complete Farm-to-Fork Solution that addresses waste (food and packaging), and farmers livelihood, by extending shelf-life, reducing and/or eliminating single-use packaging, and increasing farmer incomes while creating brand loyalty for companies involved using an inclusive certification model. Additionally, with our tech-based solution, we offer an innovative food chain transparency and education component. Government intervention and funding partners would jumpstart adoptions. Additionally, farm consortiums, grocers and shippers are looking for ways to increase profit margins while also being part of a “planet-saving “solution.

To make our solution a reality, we propose a phased pilot for our Farm-to-Form Solution. This would take place concurrently in 2 geographic locations (i.e. Africa, SE Asia, US) with satellite offices where necessary. Collaborating partners would be invited to participate including: small/mid size farmers, distributors, transport companies, sanitization facilities, retailers, local and national food brands.

**PHASE 1:**
A small initial staff hired, with packaging design & prototyping experience.

**PHASE 2:**
Pilot test the products. Data would be collected, iterations made.

**PHASE 3:**
Outreach to Government entities and NGO’s to both inform and update and for assistance with marketing and messaging the project.

We offer innovative packaging solutions for the complete farm-to-fork supply chain, utilizing cutting edge materials, modular/standardized reusable packaging forms and a Reuse-as-a-Service model. Our solution provides extended food shelf life, increased food security and health, reduced carbon footprint and better livelihoods for our farming communities. Additionally, the solution offers a new complete supply chain transparency, tracking and education system, through tech-based applications.
The Impact

Our comprehensive Farm-to-Fork packaging is designed to address different stages found in food production, distribution, food producers, retailers and consumers. Ultimately, our key impact areas are:

1. Extended food shelf-life
2. Food security/nutrition
3. Reduce carbon emissions
4. Increased farmer revenue

**SHORT TERM IMPACT**
- Improves storage life of food for farmers and consumers
- Offers complete supply chain visibility and traceability
- Offers transparency, education and motivation on food supply

**MEDIUM TERM IMPACT**
- Higher incomes for farmers
- Reduction in the overall postharvest losses
- Reduction consumer food waste
- Reduction in usage of plastics
- Reusable-as-a-Service model, creates a new job sector, with the cleaning/sanitizing, and logistical distribution of reusable and returnable packaging.

**LONG TERM IMPACT**
- Improved livelihood of farmers
- More stable food supply
- Reduction in carbon footprint
- Healthier consumer eating patterns
- A circular economy on a large scale
We believe in reducing food waste and food loss and increasing food security through the use of innovative membrane technology, and multi-layer bulk food packaging.

We believe in reducing packaging waste, carbon footprint and primary resource usage, through the transition to a circular farm-to-fork packaging system.

We believe in creating entirely new entrepreneurial opportunities within the supply chain for individuals and start-ups that support the circular economy.
Turning Barriers into Opportunities

<table>
<thead>
<tr>
<th>Systemic Barriers</th>
<th>Systemic Change Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our solution may alienate and even eliminate traditional single-use food packaging companies. There are 10 companies worldwide that produce over 90% of the single use packaging so you can assume these are large and powerful.</td>
<td>While our solution could affect the single-use food packaging companies, however the re-usability of packaging will allow for a positive carbon footprint, leading to a more circular economy. Offering entrepreneurial solutions for re-use as a service, while allowing companies to offer more sustainable packaging solutions, increasing their brand image and eventually leading to increased sales.</td>
</tr>
<tr>
<td>Initial costs for our solution may be higher than traditional food packaging currently being used especially for the farming community.</td>
<td>Initial costs for our solution may be higher than traditional food packaging currently being used especially for the farming community, however with reduction in the food loss at the farm will allow for increase in income and better livelihood for the farming community. Better market linkage offered with increased shelf life, will allow for better value for their produce, and better supply chain visibility will allow for branding and empowering the farmer associations and consortiums.</td>
</tr>
<tr>
<td>The pioneering nature of our solution may be very new to stakeholders, thereby causing uncertainty and a slow rate of adoption.</td>
<td>The pioneering nature of our solution may be new to stakeholders, causing a slight learning curve. However, with Government and NGO support by providing messaging and subsidies, along with help from major growers and food brands, a rapid information and education process can occur, providing momentum for initial adoption, along with a potential for rapid scaling.</td>
</tr>
</tbody>
</table>
Navigating Unknows

**Potential Unintended Consequences**

- Companies whose business model is single use packaging will have greater resistance.
- Grocers or restaurants who have found it easy to use disposables will not be on board.

**Thinking Ahead - strategies to avoid these consequences**

- Add a financial perk as incentive
- Creating Reuse as a Service means the possibility of using something they already own (washing equipment)
- Create brand loyalty with a certification element (i.e., “Pink ribbon” model - such as has been done with breast cancer research). Because of return and repeat consumers, we will help to tell their story and show that they are part of this tribe saving the earth, which will create brand loyalty. Adding incentives and steps incrementally will feel less forceful and create less resistance.

**ALLIES** are needed for information exchange, institutional supporters for the agenda’s program management, and committees to process decisions regarding objectives, strategies and joint work.

**FUNDING PARTNERS** can best support our plan for impact on several pilot programs.

**TALENT** can be identified, trained, and retained as the human capital needed as we scale.

**DATA AND KNOWLEDGE PARTNERSHIPS** will help drive performance, impact management and decision-making.

**GOVERNMENT/NGO PARTNERS** can be effective in cultivating and managing partnerships in order to increase impact, as well as power to make policy changes.
## Similar Solution in Action

<table>
<thead>
<tr>
<th>Category</th>
<th>Products</th>
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<tbody>
<tr>
<td>Reusable/Refillable Containers</td>
<td>Loop Algramo, Conscious Containers, WeUse, DeliveryZero, GoBox, Tiffin Indian Cuisine to-go box, PlanetOzzi, Ozarka Vessel, KeepCup, Vytal VASSHIN Revolusation</td>
</tr>
<tr>
<td>Bags for Dry Perishables</td>
<td>Purdue Improved Cowpea Storage Bags, ZeroFly Storage Bags</td>
</tr>
<tr>
<td>Bags for Produce</td>
<td>CA FRESH® bulk storage bags, CA FRESH® retail bags Xtend bags</td>
</tr>
<tr>
<td>Portion Control Container Kits</td>
<td>Loulang 21 Day Portion Control Container Kit</td>
</tr>
<tr>
<td>Shelf Life Extending Containers</td>
<td>Freshworks® containers for produce</td>
</tr>
</tbody>
</table>
FARM TO FORK
PACKAGING SOLUTIONS TO CHANGE OUR WORLD
09: Innovating at the Ag-Energy Nexus

Cohort Team Members: Aggrico Solar (Neda Riazi), Savannah Health System Innovation Ltd (Havilah Nnadozie), Alan Ireland, SolarX Works (Blake Barthelmes / Monica Vandenberg), AlphaGenesis Consultancy Limited (Jerry Yusuf), Paul Collins, University of Sheffield (Richard Randle-Bogis) Aquacycl (Juli Lacuaniello), Marli Technology Solutions (Alireza Tayeb Nama). This Cohort was guided by Tsholofelo Wechoemang.
A packaged-solution of renewable technologies including agrivoltaics, cold storage, and irrigation to increase farmer yields and reduce crop losses through a co-operative model. “Centers of excellence” will educate farmers, provide information, and receive ongoing support. A carbon credit exchange platform will incentivize farmers to adopt renewable technologies.

### The Need

Sustainable energy needs to be developed and utilised to address environmental, social and economic challenges that face the world’s food and energy systems. *With 10 billion people living on this planet by 2050, now is the time to take action and ensure resilient and sustainable food supply chains.*

Aligned with the COP 21 Agreement in Paris and the upcoming COP 26 conference in Glasgow, we are proposing a unique co-operative model to develop, scale and fund carbon-capture projects in the developing world. This solution bridges the gaps in poverty and malnutrition which are prevalent in the developing world by leveraging from high carbon emitters from the developed world. Support from funders will unlock access to renewable technologies for emerging farmers, thereby allowing for the sale of carbon credits on the international scale. This new, circular economy in rural areas will improve livelihoods for farmers, their families, and communities overall. From this new standpoint of financial security, economies can begin to build new infrastructure that supports development from the ground up.

### The Solution

Farmers stand to reap the greatest benefit from our solution because it is malleable and evolutionary; it adapts with the needs of the farmers. Our solution impacts small scale and emerging/medium scale farmers in the developing world through the use of renewable energy in the production, processing, storage and distribution of food. We present a packaged-solution of off-grid renewable productive-use technologies to be readily implemented in various cities and geographies. To increase yields, reduce post-harvest losses and ultimately increase farmer income, solar-powered agrivoltaics, cold storage, and irrigation will be offered to tier 2 farmers (medium scale) using a co-operative model. *Centers of excellence will be created in project locations that will serve as education hubs for farmers to access information from agricultural extension workers and local leaders to publicize the gains of these technologies and best practices.* Furthermore, the centers will include access to land, which can be rented by smallholder farmers in the community to use the same productive-use renewable technologies and receive after-sales support. Farmers will be incentivized to use these technologies through financing structures and a carbon exchange platform which will provide a source of income in exchange for verified carbon credits.
The Impact

The human experience is enabled by energy in the form of food, health, and overall well-being. Our solution drives change to meet basic human needs such as: a safe and stable food supply that meets the needs of a population and provides the possibility of economic growth; clean air and water for health, wellness and sustainability; and the protection from harsh environmental conditions. Revolutionizing the nexus of agriculture and energy relies on multiple components. It is multidisciplinary and multi-staged. The implementation of our solution, partnerships and processes will build upon levels of change to achieve our vision for 2030. These processes will require technological and financial innovations, education and the creation of awareness, stakeholder engagement and the development of enabling policies to drive sustainability. In the first stage of implementation, centers of excellence (CoEs) will be established among medium-scale farmers. This will allow the incorporation of renewable technologies, since this group is more educated and exposed to technology. These CoEs will serve as mentors for smallholder farmers which have a wider tech divide. In the later implementation stages, access to technology will be facilitated for smallholder farmers. This will lead to increased food and energy productivity, along with improved livelihoods and social cohesion through a circular economy.
Our solution pulls from agriculture, energy, IT, policy, supply chain, education and logistics. For our solution to be successful it must represent the synchronicity of each of these pillars -- to connect the dots between the farmers and their markets, between the hungry and those who need to eat, between the government and their constituencies. Our solution brings together the developing and developed world.
Lack of policies that support Ag-energy innovation and innovators due to over-reliance on fossil fuels. The current system is dominated by a lack of environmental consciousness. The heavy reliance on fossil fuels in industry and agriculture contributes to the increasing emissions of harmful greenhouse gases including carbon. Oil-producing and exporting countries that benefit from the fossil fuels contribute to maintaining the current system. In addition, there exists a lack of enabling policies that encourage renewable energy innovations and innovators, especially in the developing countries.

Renewable energy technology is not easily accessible and affordable in the developing world, where the greatest impact of malnutrition and hunger exists. The majority of smallholder and medium scale farmers are unable to afford this technology. As well, most solutions are in the prototype stage, increasing the difficulty of adoption.

Impunity and monopolisation of resources: Even where such technologies are available, high levels of corruption and systemic impunity allows larger multinational companies and agribusinesses to divert resources to maintain their dominance and monopoly over the markets for food and technology.

Local production of renewable energy technology such as photovoltaics, solar, renewable energy technology should be facilitated by knowledge transfer and made affordable through direct financing or subsidies. In addition, local, regional or national governments must take the lead to implement policies and other initiatives that support renewable energy. This includes regulation of carbon emissions by cities, more public information dissemination on climate change, companies and users of fossil fuels, and also supporting local or regional manufacture of renewable technology.

Our solution advocates the provision of subsidized technology to farmers. Funding and finance initiatives should be provided to farmers, along with adequate training and mentorship to enable them acquire and use these technologies. In addition, carbon credit generation and sales provide ongoing cash-flow to farmers and improve their livelihoods.

Our solution will foster a circular economic approach, with communities at the center (drawing from the ESG framework). Creating centralized, local economies with sustainable business models, these communities can resist the consolidation of resources that consistently occur within the capitalist model. ESG stands for Environmental, Social, and Governance. Investors are increasingly applying these non-financial factors as part of their analysis process to identify material risks and growth opportunities.
Navigating Ununknowns

Potential Unintended Consequences

**Environmental Impact:** the creation of some components (e.g. PV solar / batteries) using coal, heavy metals, and other corrosive materials.

**Exploitation:** There could be monopolization of renewable energy technology supply chains.

**Over-reliance on external technology:** Local communities could lose access to or (perhaps) not buy into external solutions.

**Marginalization of smallholder farmers:** Working with emerging medium sized farmers, these could dominate the older, established (or smaller farmers) thus impacting outcomes.

Thinking Ahead - strategies to avoid these consequences

Source PV through ultra-low carbon manufacturers and using natural energy storage in the form of water or phase change gel.

Develop a code of conduct regulating those who on-board to our solution e.g., all irrigation should be manufactured locally, solar panels should be bought locally, cooling system should fabricated on the continent.

Via local manufacturing chains, education (on every side of the equation) and simplification of solutions.

Increased inclusivity and education.

Call to Scaling Partners

- We are seeking to partner with entities and individuals who can bring their unique skills to our solution. We are looking at personalities such as Aliko Dangote, Akon, Tony Elumelu and Mo Ibrahim to buy into our vision with their business acumen.
- We are seeking to work with financial institutions that can see the benefits and work with us over the medium to long term. Partners we seek ADB, NEPAD and World Bank.
- We want to partner with academic institutions and NGOs to drive our solution forward reputationally, technologically and socially. Partners include the United Nations World Food Program, the Elders, local universities, technologists and researchers.
Companies like Nigeria’s ColdHubs, Kenya’s SolarFreeze, or various other innovators have been working on specific innovations to empower youth and women smallholder farmers as well as further enable the aquaculture industry. Coldhubs (as an example) has seen post-harvest loss reduction of 80% and improved annual income of 25% by using their PV-enabled walk-in chillers. The key outcomes include a reduction in water consumption to produce the same or increased volumes of consumable food, improved economic opportunity and improved stability.
COMMUNITY CO-OPS FOR TRANSFORMATION
10: Building Soil Health

Cohort Team Members: SmartCloudFarming (Suvrajit Saha, Michele Bandecchi), Horizon Ag-Tech (Brianne Cangelose), Geohebeth Lines (Senyo Kofi Agbleze), Jessen Pabulum Limited (JACKSON, Kingsley Etim), Distinct Horizon (Sayyeda Asra, Nikhil, Abhay, Kiran), BlissEffect (Laureen Keefer), Youssef Ben Hmiti. This Cohort was guided by Catalina Zamora Fonck
3to30: 3 levers to transform soil health by 2030:

**Policy:**
- **Classify regenerative farming as a climate service** provided by farmers. We pay them for providing this service.
- **Introduce Soil-Damage-Penalty:** Conventionally grown foods should be more expensive to produce/consume rather than regeneratively grown food being unaffordable. This will reflect true cost to the soil and the environment.

**Technology:**
- **Build a global soil database and a common data standard:** Without high quality soil data and a data standard, there can be no data-based solution for soil monitoring and management.
- **Build a soil health education & advisory app** for policymakers and farmers, everywhere. Global in scope, but local in implementation, this will create common ground between specialists, project developers, policymakers, funders.

**Grassroots Involvement:**
- Promote and fund community vermicomposting

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**The Need**

Since the advent of industrialisation, intensive farming has been the norm. Yet, advances in soil management have been limited; soil management is neither data-driven nor evidence-based. Therefore, a sizable amount of guesswork and approximations are involved, and laboratory tests are labour-intensive and expensive. **All this has led to poor soil management.**

The troubling outcomes have been:
- A steady decline in soil fertility*, soil organic carbon and soil biodiversity
- An increase in fertiliser applications
- Contamination of groundwater
- An accelerated release of soil carbon into the atmosphere

*Rodale Institute

**The Solution**

Our solution has identified three levers that need to be exploited to have any discernible impact on soil health. All three go hand-in-hand and need to be seen as pieces of a holistic solution. These are policy measures, mass deployment of modern technology solutions & technical aids, and grassroot community involvement.

- **While our solution is designed keeping all countries in mind, we would like to start in places where it would have maximum impact and participation from key stakeholders such as policy makers and industry. This could be north & west African countries or those in South America that are key players in the global food supply chain.**
- **The most effective way to start would be building the soil database with soil data from the above-mentioned regions and building the soil health education and advisory app.**
- **The soil database and soil health advisory and education app would be implemented by our cohort members and influence farmers, policy makers, government agencies, and entrepreneurs.**
- **The community vermicomposting is already in implementation in the USA and can be expanded as part of the Action Agenda implementation.**
The Impact

SHORT TERM IMPACT

• Increase in soil biodiversity, as observed in Spain and Cyprus
• An organised and data-oriented approach to soil management and monitoring
• A big momentum - esp. in developing nations - in the adoption of regenerative agriculture

MEDIUM TERM IMPACT

• Increase in organic carbon content of soils due to sequestration of atmospheric carbon. This will result in rich, healthy soils (SDG 1 & 2)
• Increase in nutrient and water retention capacity of soils resulting in reduced fertiliser application and less irrigation
• Foods having a higher nutrient density leading to better health and well-being (SDG 3)
• Clean groundwater devoid of fertiliser residues leading to better health
• Increase in funding and investments in soil health R&D and soil management
• Technology parity in developing countries w.r.t modern analytics-based soil management

LONG TERM IMPACT

• A global soil database that is regularly updated with soil data from across the world. This will lead to soil management based on insights provided by soil data and high-resolution soil maps.
• Establishment of true-cost accounting and proof of impact in the food chain: Value trumps over costs, long-term thinking prevails.
• A thriving and functioning carbon credits market that provides farmers high incomes through participation in carbon markets
• Creation of new jobs around a soil-based economy that secure livelihoods (SDG 8)
• Reduction in displacement of people due to unproductive soils and global warming (SDG 13)

EFFICACY MEASUREMENT

• Baseline assessment of key soil health indicators and carbon sequestration using remote soil analytics and 3D soil maps
• Participation in grassroots initiatives (vermiculture) and global buyers’ registry
• Change in farmers’ incomes and monitoring change in farm inputs and agricultural emissions
The planet needs to switch to regenerative agriculture and an analytics-based soil management to improve soil health globally and transform agriculture from an environmental polluter to a climate solution.

The time is now to take stock of what levers we have to transform soil health globally by 2030.
Turning Barriers into Opportunities

Systemic Barriers
Systemic Change Opportunities

**Priority of Cost vs. Value**
- A cost-focused mindset and KPIs do not allow for true cost accounting in agriculture.
- Putting profit and revenues over soil health will only continue to jeopardise soil health and exacerbate global warming and CO2 emissions.

**Power Imbalances in Food Chain**
- Unbalanced power relationship between farmers and buyers in the food supply chain means farmers cannot prioritise soil health and face difficulties implementing regenerative agriculture.

**Lack of Soil Health Education**
- Lack of awareness, education, and long term thinking w.r.t. to soil health & soil management policies, esp. with policy makers in governments and key decision makers in companies.

**Systemic Change Opportunities**
- Introduce true-cost accounting in agriculture that factors in soil organic carbon, soil biodiversity, and agricultural inputs.
- Evaluate policy makers and hold them accountable on long-term impact of their policies on soil health and soil management, the value created by it rather than costs cut or opportunities created for BigAg.
- Create an open registry of buyers and score their procurement policies w.r.t soil health & biodiversity.
- Set 2030 as deadline to switch completely to regenerative agriculture globally.

**Systemic Change Opportunities**
- An educational and advisory app - global in scope in terms of topics, but local in implementation - imparts knowledge through videos, infographics, articles, and gamification. Policy makers, experts, farmers, project developers can come together on this platform - wherever they may be - have discussions and find common ground.
## Navigating Unknowns

<table>
<thead>
<tr>
<th>Potential Unintended Consequences</th>
<th>Thinking Ahead - <em>strategies to avoid these consequences</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>A potential increase in taxes to pay farmers for regenerative farming climate services</td>
<td>Currently, fertilisers, pesticides, seeds, etc. are subsidised. Regenerative agriculture will require less fertilisers and pesticides, thus reducing subsidies. This can be channelled into a climate services budget. Moreover, industrialised nations, e.g., Germany, find it cheaper to pay a daily €800,000 (!) fine for not meeting nitrate leaching than to fix the problem. The money seems to be there already.</td>
</tr>
<tr>
<td>Increase in overall cost of food due to soil damage penalty &amp; labelling</td>
<td>There will be an increase in food prices, but much of that increase can be controlled through a leaner food chain with fewer intermediaries. This ensures farmers get fair incomes.</td>
</tr>
<tr>
<td>Paying farmers for an environmental service (storing carbon in soils) could mean that individuals/entities abuse the scheme and take advantage of remediation pay-offs</td>
<td>Abuse/misuse can be prevented with <em>evidence-based</em> remote soil analytics and monitoring.</td>
</tr>
</tbody>
</table>
Similar Solutions in Action

ITALY

Italy: A 4-hectare vineyard in Verona/Italy has been implementing regenerative agriculture since 2013. The transition lasted 4-5 years, but yielded great results: volcanic soil poor in essential nutrients was replenished and nutrient balance achieved using cover crops. Synthetic fertilisers were not applied any more. Buffer strips enhanced biodiversity leading to just 2-3 sprayings instead of the usual 12-13 usually necessary. The use of wheat straw mulch increased water infiltration, reduced water losses and surface runoff in a region with 20% slope.

PARTNERSHIPS:
- Regenerative project developers and NGOs, philanthropic organisations supporting environmental projects
- Agri-food businesses and regenerative agriculture specialists
- Policy making bodies involved with soil health, regenerative agriculture, and climate change

CAPACITY:
- Expert advisory, networking & introductions, and/or active participation
- Accessing markets for implementation & reaching out to end-beneficiaries
- Driving desired policy changes to classify regenerative farming as a climate service and introduce the soil-damage penalty

FUNDING:
- To implement global soil database and deliver technology parity in soil management to farmers worldwide
- Logistics to organise training at national levels
- Communication and advocacy promoting regenerative agricultural practices, regeneratively grown food
- To build community vermicomposting sites
- Development of soil health education and advisory app for educating policy makers and farmers
TRANSFORMING SOIL MANAGEMENT TO RESTORE THE WORLD’S HEALTH
Cohort Team Members: Roy (Bruce) Quinby; The Toothpick Project (Claire Sands Baker, David Sands, Christopher Suh); Maati-Paani-Asha Centre at SESA & GSG College (Sumeeta Gawande, Betsy J. Briju, Dhanraj Tayade); AgriWater (Liesl Hattingh, Riaan Kirsten); Trees for Children (Janet Cundall); International Tree Foundation (Teresa Gitonga); Busaino Fruits & Herbs (Judith Bakirya); Dr. Prasad Mahindarathe & W. Rajindra Rohitha; CABI (Suzanne Neave); Elite Researchers Empowering Community (Mervious Kiwanuka); A Greener World (Emily Moose); The Farm of Francesco (Maria Virginia, Mateusz Ciasnocha, Rita Babatunde); Alma Tierra (Ana Lucia Ruiz). This Cohort was guided by Simona Grande.
ACTkit (Agriculture Connections for Transformation Kit)

A catalytic connector that will mainstream Regenerative Agriculture and Agroecology (RAA) by leveraging the expertise of transition catalysts (who work with and deliver impact directly with farmers, farmer groups and agricultural educational centres) to bridge the gap between farmers, and policy and financial decision makers, by providing insights, resources, and metrics. ACTkit will also strengthen the impact of the transition catalyst.

The Need

There is growing evidence of successful solutions, but most are siloed and not:

- Accessible (to key decision-making stakeholders, and in terms of the digital divide, language etc);
- Structured to show proven pathways;
- Variable to be actionable within different realities (policy zones, markets, ecological regions, cultures and knowledge sets, budget, operational scale etc);
- Enabled with enhanced matchmaking opportunities.

Farmers are at the heart of this solution. Empowering transition catalysts to support farmers will reverse the unintended consequences of well-intentioned policies and financial mechanisms.

Connecting policy and finance partners with transition catalyst partners is critical to the successful creation and wide uptake.

The Solution

ACTkit (Agriculture Connections for Transformation Kit) will mainstream Regenerative Agriculture and Agroecology (RAA) by leveraging the expertise of transition catalysts (who work with and deliver impact directly with farmers, farmer groups and agricultural educational centres) to bridge the gap between farmers, and policy and financial decision makers, by providing insights, resources, and metrics. It will connect local communities on a global scale, creating vital interstitial connections throughout the food system.

Utilizing AI, ACTkit is the next generation of data platforms. It offers the unique ability to identify duplication of efforts, suggest matchmaking, and provide a forum that encourages transdisciplinary solutions by engaging implementers ranging from farmer groups to corporations to governments to NGOs to data collectors (e.g., NASA’s new land monitoring development).

Its implementation will be very organic and dynamic, kickstarting a process of cascading benefits and participation, by mimicking the natural positive feedback loops existing in nature. The solution will start with the members of the cohort, who are experienced transition catalysts. Their understanding of the barriers and ground-level experience will provide vital insights to kickstart this process, which will inspire and actively encourage other stakeholders and influencers to become involved in the co-creation and development of a truly transformative approach.
The Impact

While we can measure acres or hectares, calories and nutrients, income, carbon capture, and even women's empowerment, the most elusive component to capture and measure is time. How much time is lost when thousands of individual farmer groups each seek a solution for a barrier (eg. access to transition finance or seeds)? How much time is lost when research organizations duplicate efforts on a single barrier yet overlook other critical areas? How much time is lost when a solution isn’t communicated to a broader audience (e.g. best practices for biodiversity or water use)? How much time is lost when a policy or product is approved that is profitable but has unintended negative consequences for farmers, the environment, communities and ultimately food systems?

Ultimately, ACTkit finds and shares time - a precious commodity when we are in the climate emergency. The platform reduces redundancy and highlights gaps in our food system. It provides a mechanism for policy makers and funders to hear the voices, stories, struggles, and successes from farmers and transition catalysts, which will influence policies and funding, expediting resources needed for farmers’ success. And, it provides a space to share knowledge - in critical moments (eg. locusts) as well as long term goals (carbon sequestration and ecosystem restoration).
By fundamentally changing the way we interact with the Earth from exploitation to healing, we engender the power, not just to restore the biosphere, but to transform human culture and how we live together on this planet so we can thrive into the future.
Policies and political influence - Government food security policies concentrate on a limited number of staple foods and fail to protect Indigenous seeds. Policies measure yields and income, which drives intensive monoculture systems that destroy soil health, pollute waterways and reduce nutrition in food.

https://www.wri.org/research/farm-restoration-subsidies

Financing - Financial incentives support a high input production system. They strongly influence both smallholders (subsidies, loans and funding priorities) and large commercial productions (subsidies, loans and/or penalties) to maintain the status quo and harm ecosystems. Shifting from the existing system poses high risks for both farmers and their suppliers if they lack the resources (financial and knowledge) to make, and maintain, the transition.


Knowledge - The knowledge ecosystem (innovation, research, and sharing) is designed and revolves around the current status quo - advancing conventional agriculture. Dominant knowledge does not include all elements of the food system and all risks of maintaining the status quo. Many practitioners in RAA operate in silos with minimal collaboration and co-creation opportunities, especially cross-disciplinary knowledge. Importantly, current resources offering in-depth knowledge and engagement opportunities are not “knowledge commons” or “open access”, which perpetuates the digital divide for smallholders and the transition catalysts who work with them.

ACTkit will provide universal access for free. It will focus on working alternatives in terms of policies, financial mechanisms, practices and technologies that support RAA instead of conventional agriculture. It has the potential to be an aggregator for other suitable knowledge that currently exists in silos. It can also become a data collection tool to inform future decision making.
Navigating Ununknowns

Potential Unintended Consequences

1. The struggle to define who is part of the connector, i.e. defining agroecology or regen ag & the resulting divisiveness or greenwashing that can result;
2. Who gets put out of work and as a result becomes displaced and whose work is threatened by RAA and as a result uses their resources to actively counter the solution/RAA;
3. Solutions in one region don’t transfer to another region without modification, thus reducing efficacy.

Thinking Ahead - strategies to avoid these consequences

To mitigate the risks and consequences, the GAIN principles of engagement will be promoted through ACTkit: Accountability, Transparency, Mutual Respect, Mutual Agreement, Risk Management, Quality and Ethics, Responsibility. These principles are built within ACTkit, starting with clear organization profiles and rules of engagement.

Our solution has two steps: creation and implementation. To accomplish this, we are seeking:

FUNDING

A 3 year budget = ~$3-5 million to implement the solution.
- Infrastructure: Building the platform (incorporating machine learning for enhanced match making).
- Content: Guides/editors, content creators, language translation, and tool collection.
- Participation: Regional managers/hubs, partnership development.
- Program Leadership: Supported, ongoing participation by Cohort.

PARTNERSHIPS

Stakeholder Partnerships are needed to populate and amplify ACTkit through participation and promotion:
- Co-designing and contributing content to ACTkit.
- Building a regional in-person network.
- Bringing awareness of ACTkit (capacity-building).
Similar Solutions in Action

UGANDA

20 years ago in Uganda, to use degraded land to combat poverty and malnutrition, Judith Bakirya implemented RAA by planting trees, herbs, and food crops. BuFruits evolved into an RAA enterprise that trains farmers to farm the forest along permaculture principles, and handles marketing for growers. BuFruits worked with 1,256 small farmers to become the largest producers’ cooperative of avocado and jackfruit in Bugiri area.

HAITI

Since 2011, the Smallholder Farmers Alliance of Haiti has planted millions of trees, with support from Timberland clothing company. Farmers earn “tree currency”, which they can exchange for inputs, training, and microfinancing. Yields have gone up 40%, and incomes doubled. Farmers also plant cotton, allowing Timberland to now source 30% of their organic cotton supply from Haiti at fair prices.

AUSTRALIA

Australia is the global leader in soil carbon policy and finance for farmers through its Carbon Farming Initiative (CFI). It is an integral component of the country’s Emissions Reduction Fund and allows land managers to earn carbon credits by changing land use or management practices to store carbon or reduce greenhouse gas emissions. It includes an aggregator function for grouping smaller entities. Europe is now following this example.
HEAL THE EARTH WITH AGRICULTURE

Cohort Participation Countries

ALMA TIERRA
- del rancho a tu mesa -

AgriWater
Advanced Oxidation Processes

CABI
12: Scaling Agroforestry

Cohort Team Members: WBCSD (Benedict Gardner), NUU (Rafaela Gontijo Lenz), WWF Thailand (Abhinand Aryapratheep), Brazilian Agriculture Research Corporation - EMBRAPA (Ana Paula Turetta), African Plant Nutrition Institute (APNI) (Pauline Chivenge), Fundación Amigos del Campo (Gustavo Nouel-Borges), MOOF-Africa (Peter Murage). This Cohort was guided by Hira Wajahat
**Agroforestry**’s significant promise for smallholders remains uncultivated, with cultural barriers and limited knowledge holding back first adoption. Through a comprehensive, participatory online wiki, supplemented by in-person training, we will connect farmers worldwide to the agroforestry user’s guide aimed at smallholders, providing simplified practical guidance and connections to regional market actors.

### The Need

Existing intensive farming systems are a significant cause of deforestation, degradation, and biodiversity loss, and fail to provide farmers, especially smallholders, with livable incomes. **Agroforestry, an agroecological practice in which trees or shrubs are combined with crops or livestock in the same plot of land, can help solve these problems through reducing soil erosion and providing diversified income for farmers. Thus, agroforestry can provide multiple benefits for the farmers.** However, smallholders lack access to information and models suited to their local conditions. They are disconnected from the global network of agroforestry experts, and would struggle to find suitable buyers even after investing in a transition. These all need to be addressed in order for this important transition to agroforestry to happen at a sufficient scale. This is what funding and technical support from partners will unlock - enabling the creation of an accessible online platform aiming to close the information gap, enabling farmers to make informed decisions towards a more sustainable way to farm.

### The Solution

A simple, easy-to-use online wiki, where knowledge on agroforestry is aggregated and adapted to regional contexts. The platform, funded and moderated by scaling partners, will provide farmers with a comprehensive user’s guide for the practical implementation of agroforestry, including: the best crops for their soil type; where to buy inputs and source finance; and agroforestry management. An additional function will act as a ‘marketplace’, where local buyers and producers can list themselves in directories, to help create the market connections needed for sustainable agroforestry enterprise.

The information will be sourced from agroforestry practitioners and experts, with all content adapted to be as visual as possible (limited text will also save on translation cost). The platform will be supplemented by in-person training applying the principles of the wiki to the local context, potentially through local extension services.

In order to grow the network, and increase awareness on the platform, marketing/advertising efforts will be needed, supported by partnering with organisations with existing networks on the ground. Personnel will also be needed, to moderate content and keep the platform alive and updated as well as In-kind or low-cost tech support will need to be in place to implement the platform.
The Impact

**Making agroforestry profitable through connections and guidance** - In the short term, advice and connections will improve local small business capacity to make agroforestry profitable, which through word of mouth will encourage a small-scale change in business practice which can be easily replicated (and made desirable through improved performance) across rural communities.

**A change in demand signals** - An increasingly prevalent number of agroforestry providers, who will be better connected to buyers through our marketplace functionality, will begin to shift global demand towards agroforestry products. This will see our impact spread beyond primary Agropedia users.

**A major shift from Conventional Agriculture to Agroforestry systems** - Our long-term goal is a major transition in agriculture, which through continual scaleup will help to produce farming systems with higher biodiversity, carbon sequestration and improved water quality. Farmer incomes and resilience will both be improved.
We aim for our solution to become the global interactive platform for Scaling Agroforestry, in which farmers feel comfortable to drive their own transition towards a new relationship between farmer and land. This will be done by farmers, supported by other farmers. Adding a 21st Century spin on the word-of-mouth communication that has powered agriculture for millenia, we aim to inspire a transition driven by a transformational process - in which farmers lead the way, empowered by other farmers and their knowledge bases.
Turning Barriers into Opportunities

Communities are not familiar with agroforestry technologies and techniques - Through conversations within our personal networks, we have determined that awareness of agroforestry is very low amongst smallholder farmers. Increasing this awareness will be central to the success of our solution, and will require novel ways of broadcasting the message.

Entrenched cultural beliefs on gender, land tenure, and even agroforestry itself act as a barrier - Much like creating change in any system, an important barrier to overcome will be entrenched interests and beliefs. Gendered power relations and uneven decision-making powers amongst stakeholders must be addressed. Dislodging the entrenched support of conventional agriculture, either through inertia, a lack of knowledge of alternatives, or financial interest, will also be a significant challenge.

Existing models of food consumption allow global demand to shape supply, ignoring local and regional needs. The barrier here is a hegemonic food system geared towards cash cropping. This model is entrenched in a financial, political and societal status quo that overrides a focus on local and regional food needs. Overcoming this hegemony, which is supported by interest groups making billions a year from unsustainable conventional agriculture, will likely be challenging.

Systemic Barriers
Systemic Change Opportunities

• Promote training that translates the scientific language into a simple language that can be easily understood by the community, with a global vision. Where possible, provide visual aids to this information.
• Ensure that the producers have access to equipment (mobile, tablets, computers...), at least communally. This may need to be coordinated through a local partner or state agricultural extension staff.
• Develop the platform to be as intuitive as possible, making it accessible to those with low levels of digital literacy. Young people should be trained to provide assistance to less tech-literate members.
• Promote a participatory process to help co-design solutions in which all voices are heard and valued. Certain content and training should be tailored to female smallholders / agricultural workers that can promote their engagement.
• Organise female-led training groups and showcase female agroforestry champions
• Address content to young people, detailing how young people can get involved in agroforestry
• Showcase examples of transition from conventional farming to agroforestry, to highlight that transition is possible, even after a lifetime using conventional techniques
• Pitch content to both landowner and land worker, if those two positions are filled by different people.

• Promote the benefits of local food products within local communities, including the health benefits which may not be found in cash crop-focussed agriculture.
• Use the platform to help smallholders connect with local restaurants to sell local, organic, healthy produce.
• Help international buyers source products through the marketplace function, to help build consumer pull for agroforestry products.
Navigating Unknowns

Potential Unintended Consequences

Inaccurate or misinformation is shared through the app - Unintended or malicious sharing of false information about agroforestry (or on unrelated topics) could lower the quality of the product and risk ramifications with governments.

Focus on deploying our solution detracts from other areas of need - There is a small risk that the success of our platform, with its agroforestry focus, will overshadow the need for other areas of need for farmers - such as access to credit, connections to market, or insurance against climate change.

Agroforestry increases costs and harms smallholder profits - There is a real risk that the solutions we promote may not increase smallholder profits, and could indeed harm them.

Thinking Ahead - strategies to avoid these consequences

Moderation will be key. This will likely involve cooperation with local partners with knowledge of local languages.

We should present the agroforestry transition as just one in a series of changes that will improve producer livelihoods, linking to (though not producing our own content on) useful resources on these issues.

We will need to ensure that all information works towards the triple bottom line, targeting stronger incomes, stronger forests, and improved livelihoods.

We are looking for partners to support us with:

TECHNICAL SUPPORT
Support from a specialist IT company to roll out the platform and keep it online.

EXPERT KNOWLEDGE
Access to reliable databases to provide information about natural resources and crop species for each agroforestry design.

TECHNICAL ASSISTANCE PROVIDERS
Local partners that can provide local training, educational materials, and translation to different languages; This may include farmers associations, local businesses, cooperatives, and NGOs that can support and train local farmers in agroforestry transition.

MARKETING ASSISTANCE
Local and international media to promote the use of the platform and start the long process of challenging entrenched mindsets that oppose agroforestry.
Similar Solutions in Action

INFORMATION PLATFORM:

**Energypedia**: Energypedia is a wiki platform for collaborative knowledge exchange on renewable energy, energy access, and energy efficiency topics in developing countries. It can be considered a proof of concept for Agropedia.

RESEARCH CENTERS:

**CIFOR / ICRAF**: The Center for International Forestry Research (CIFOR) and World Agroforestry (ICRAF) are two research centres investigating the value of agroforestry. With a mandate to work with smallholder farmers in developing countries, they produce high-value research on the topic of agroforestry, and could potentially be factored into the design of our project.
PLANTING SEEDS FOR A GRASSROOTS FARMING REVOLUTION
13: Unlocking Data for Food Systems Governance

Cohort Team Members: HireMyFarmer (Moin Mohammed, Vamshi krishna, kirin valluri, Rizwan, Visishta challa, Johnson, Sara Gross, Sarah Lynch, Shen Tong), Phyllis Marquitz, P-Curiosity Lab, Mohammed VI Polytechnic University (Oussama Abboudi), Eleutherios (Rob Kara), Axfoundation (Maria Lundesjö, Maria Smith), Wageningen University & Research (Priska Prasetya), Abby Mueller Designs (Abby Mueller), ESYA Foods collective (Sulipta Das). This Cohort was guided by Darío González
Our website enables global partnerships between stakeholders in the global food system to share data, products or services and allow organizations to reach multiple providers through a single request. This helps organizations expand their reach, get better prices and higher quality solutions, whilst reducing the redundancy in the system.

The Need

Organizations around the world are trying to help farming communities, but due to geographic limitations it is difficult to find centralized solutions that are accessible, affordable or available, which creates a redundancy in investments on similar solutions.

We need to cultivate global collaboration between all stakeholders in the food sector to share data, products or services.

With government support on policy, sponsorship investment, and participating organizations, we will cultivate partnerships across the service sector and grow the collective capacity of our human socio-political or economic system. We aim to serve all 7.9 billion human beings and 46 million+ businesses around the world who seek the benefits of collectively self-organizing with one another.

The Solution

We are proposing a website that enables stakeholders or organisations in the food systems industry to be able to self-organize or cooperate (i.e. share data or buy & sell products or services) with one another online.)

Stakeholders or organisations would register with the website and create a service about themself, business or organisation. They could set a price or not, if they want to sell their service to other services in the system. Services communicate with one another through a request that they can scale to invite other services to help manage their request.
A farmer wanting to grow food on his land might need seeds so he creates a request for some seeds. The person supplying the seeds might need help delivering the seeds so they decide to scale the request and create a sub-request for a delivery service. After the delivery driver picks up the seeds and is on route to the farmer, they might get a flat tire and scale the request again, and create a sub-request for an AAA Roadside Assistance service.

We hope that this pattern of being able to subdivide the request in this way can help stakeholders and organisations in the food systems industry to be able to manage more complex requests to do with food.

This solution will be implemented by Cohort 13 and its dedicated team of analysts, designers and developers as part of the United Nations Food Systems Summit in September 2021. We will work together to help design, develop and maintain the source code to run on the internet and provide a website for all stakeholders or organisations involved in the food systems industry.
The Impact

If implemented as intended our website will help create change by enabling humankind to transition from a linear, business-to-consumer (B2C) society into a non-linear, business-to-business (B2B) society. In the short-term we will be focusing on transforming the most important industries first, such as food and healthcare. But, in the medium to long-term we want to disrupt all vertical markets such as energy, education, hospitality, tourism etc. Besides having support by partners, these outcomes will be achieved because of the platform or way in which the service is being delivered. i.e. As a website via the internet, giving all stakeholders or organisations easy access to the service and its capabilities.

Signs that the solution is working is when the cost to run the website or provide our solution to the world is reduced to zero. This is because of the scaling effect that the solution provides and how administrators of the system can create their own requests to maintain the system.
Turning Barriers into Opportunities

**Systemic Barriers**

Systemic Change Opportunities

**Environment & human health:** Lack of support from government to establish & enforce policies that enable the service sector (i.e. individuals, SMEs, NGOs or other governments) to collectively self-organize with one another; sharing of data, products or services.

Support and collaboration with government(s) to develop a website or self-sustainability policy that enables the service sector to collectively self-organize with one another or share their data, products or services.

**Establishing an environment of trust:** Aligning businesses and nation states with diverse needs, operations, and belief systems.

Provide adequate incentive and security assurances that allow previously incongruent partnerships to prosper.

**Livelihoods:** Revenue model is not guaranteed to generate the sustainable, long-term profitability required by stakeholders and investors to establish, scale, and manage a website and its infrastructure.

Partnering with a sponsor such as the United Nations to implement a scalable revenue model that will sustain the design, launch, and management of the platform.
Navigating Unknowns

Potential Unintended Consequences

- Hackers or viruses infecting the system in order to steal data.

Generate a power shift in the food systems or agricultural industry that will require a period of adjustment and transition.

Thinking Ahead - strategies to avoid these consequences

Our website will conform and adhere to good code and design standards for software development and the storage and manipulation of data. And internet standards and security practices for the sending and receiving of information.

We will implement a phased approach in order to mitigate any negative impacts it may have on businesses or existing market places.

CALL TO SCALING PARTNERS

At this point of our solution, we are seeking experts from government institutions, non profits, private organisations, PR and think tanks, that can help us pilot and implement the solution in the first phase. Followed up with help to scale the application over more demographics and markets.

We are also looking for scaling partners that are interested in sponsoring or testing the system, such as an organisation working within a small demographic area.
Similar Solutions in Action

Our solution hasn’t had an impact yet and is still being designed, developed and tested. But the B2B technology has already had an impact on human society, such as the internet and how an end user's request for a website is made redundant. For example, when a user requests a web page, their request may go through several different servers before reaching its destination. Our solution does the same thing by providing a way for services to scale the customer request inviting other services to help them manage it.

Other areas that use a B2B system are crowdsourcing and community gardens. For example Kickstarter and the raising of money to help a startup design and develop a new product or service. Or a community garden where people in the community are providing a service to make the request for food redundant.

Other companies such as Fispace (http://fispace.eu/index.html) are exploring these tools and techniques to make customer requests in the agri-food industry redundant. Fispace provide end users with a platform to build new software or services, that can communicate with other services and share each other’s resources or data.
Cohort Participation Countries

ORGANIZING + OPTIMIZING
WORLD’S AGRI-INDUSTRY
DATA SERVICES + SOLUTIONS

ABBY MUELLER DESIGNS
AXFOUNDATION
WAGENINGEN UNIVERSITY & RESEARCH
14: Upskilling Farmers through Education

Cohort Team Members: Pushtikar Udyog Private Limited (Arvind Singh), Sustainable Solutions for Life (Ilan Madalitso Saini), Carib.farm (Laura Macneil), Savannah Health System Innovation (Suzzy Niyang and Innocent Ujata), Living Income Community of Practice (Kristin Komives and Stephanie Daniels), EARTH University (Javier Artiñano and Ann Misner), Prince Justin Ajinga Tanyi), Laila Janati, AgroPaths Development Initiative (Martin Ubir), H.I.L.T (Richard Chiteza), Emma Ann Omuleke, Ashraful Islam Rokon, Patton Kalunga, Tutuwa Ezra Kimeta Iribom, BLOC NATION (Ayana Kamijima, Tomoharu Hishikawa, and others), Aje Agriculture (Abass Akande), Hilary Hao. This Cohort was guided by Albert Kure
FarmAware is a social enterprise leveraging technology to provide farmers and partners in their ecosystem easy-to-access training and information on climate adaptive farming practices and agribusiness, along with resources to improve production and build capacity. FarmAware combines a digital knowledge-sharing platform with community farmer outreach centers to create a network to support underserved farmers in the Africa, Caribbean/Latin America, and Asia/Pacific (ACP) regions. This enterprise particularly focuses on youth and women farmers to increase yields and climate resilience, access affordable finance and inputs, utilize new technologies, and improve livelihoods.

The Need
Smallholder farmers are the backbone of global food production, providing 80% of the food consumed in the developing world. Building their capacity is essential to food security and the achievement of the SDGs. However, small-scale farmers, particularly women and youth, are limited in their ability to upskill by challenges such as small land size, high cost of seeds and fertilizers, lack of financing and more. They often depend on traditional farming methods and community knowledge. Many smallholders cannot afford to innovate and invest given their low profitability and risk of negative yield impact. Further, sometimes small-scale farmers are unaware of the resources and partnerships available.

The Solution
FarmAware is a unique farmer engagement mechanism that is linked with a digital knowledge network. Community farmer outreach centers will engage underserved farmers, particularly women and youth, to gather to receive training, exchange challenges with their peers, and access available resources from the digital knowledge-sharing platform, such as new technology or financing.

FarmAware will launch in three geographies for our proof of concept. Each prototype will launch with a team of digital experts and farmer support experts, farmer Union leaders, and representatives of the relevant Ministry of Agriculture.

STEP 1
Identifying communities and geographies where the need is greatest and connecting with key players in each prioritized geography -- content providers, farmer organisations and the community leaders.

STEP 2
Designing the prototype for the knowledge network and for the outreach center, and then testing a minimal viable product for each the digital knowledge network and the community outreach farmer outreach centers with users and content providers in the three geographies.

STEP 3
Finalizing the programme design and scaling up to more farmers in each geography and to more geographies.
The FarmAware offers a two-pronged approach: 

(1) digital knowledge network will bring together resources that farmers need and 
(2) the community farmer support centers provide the 'last mile', helping to extend 
this digital knowledge to the community. In this way, underserved farmers who 
would otherwise not use or have access to a digital network are able to make 
use of these resources and apply this knowledge. This pairing opens the door for 
several impacts.

This pairing opens the door for several impacts:

**SHORT TERM IMPACT:**
more farmers will be able to 
access information about farming 
techniques and find connections to 
other needed services

**MEDIUM TERM IMPACT:**
equitable food and nutrition In 
the medium term, farmers will 
improve their farming techniques 
and received improved financial and 
other service

**LONG TERM IMPACT:**
In the long-term, farmers will 
experience improved productivity 
and thus enjoy improved 
livelihoods. Agriculture, as a 
profession, will be made more 
attractive.

We will know that our solution is effective by:

- Growing participation on digital network and community support centers, and 
  expressed interest by farmers in extension of program to new geographies
- Community farmer support centers include underserved farmers and help them 
  use resources on network
- Participating farmers are applying new knowledge and see improved farming 
  outcomes and living standards
Turning Barriers into Opportunities

**Lack of financing for sustaining community networks + digital hubs** - There are limited opportunities to secure funding for solutions such as FarmAware. Private capital and venture funding for social enterprises is still limited and would require more developed business case on eventual ROI. Government and development funding often requires particular approach to be proposed. Therefore there is low funding availability for initial development and testing of new concepts.

**Lack of reliable data, and digital infrastructure** - Many governments in developing countries within the ACP regions do not capture data effectively. Therefore there is no reliable source for measurement. There is also the inability to track data in the remote locations where many smallholder farmers are concentrated and lack access to the internet. These problems are exacerbated by some farmers’ mistrust of technology and field workers. Access to cellphones and connectivity limits farmers’ capacity to connect to digital hubs.

**Lack of Stakeholder support for Farmers day-to-day challenges** - Although government Agriculture Ministries make efforts to provide local extension services, these services are rarely sufficient to meet the steep challenges of small farmers across the ACP. In the Caribbean region one extension officer supports up to 1,500 farmers, and in many parts of Africa the extension services situation is in excess of 10 fold. Private Sector extension exists in some regions, but is not widely available to all farmers, and is often focused on short-term ROI.

A knowledge sharing network will facilitate access for more and varied farmers to innovative funding options. The network will be fueled through partnerships with financial institutions and corporate funders who can provide low interest/low collateral finance; as well as regional development banks that are creating low-cost farmer financing. One of our cohort members is developing a regional solution that allows farmers to purchase supplies on a “PayAsYouGo” basis which delays repayment until they reap their harvest.

Our network platform will gather anonymous data from users. The sole purpose of our data collection is to help shape the content to better address farmer needs and research goals. Data will be collected in compliance with data protection regulations. This data will also provide insights to inform our forward moving decisions to help us share knowledge that solves the most pressing small-scale farmer problems. We will also source data from our partner research institutions in the ACP regions we serve, and gather data through one-on-one and group discovery interviews with farmers virtually and at the community level.

We have captured and shared farmer stories to inform our potential stakeholders - thereby reducing the chain of communication. This approach will be ongoing in the community farmers outreach centres to ensure farmers voices are shaping our solution. We also partner with Agri-institutions, liaising with communication specialists to regularly capture farmer challenges to share with stakeholders.
Navigating Unknowns

Potential Unintended Consequences

- Farmers productivity may be negatively impacted by applying recommended practices
- Farmers may lose market access due to breakdown of relationship with current middlemen
- Solutions and partners recommended through platform are not reliable and cause issues to farmers
- Dislocation of ag extensionists due to unexpected success of digital resources

Thinking Ahead - strategies to avoid these consequences

- Carefully select recommendations with input from agronomy experts, include risk sharing options in the platform
- Include learning on negotiation and partnership building in the platform to help farmers manage positive relationship despite diversifying buyers
- Careful due diligence & regular reviews of partners featured in the platform, transparent feedback mechanism for farmers to evaluate their experience
- Ensure agricultural extension agencies are an integral part of community networks and digital resources
Our network solution comes from the challenges that ACP farmers have shared with us. Our solution will directly impact the real-life problems faced by small-scale farmers, by combining the power of technology with the power of the following partnerships:

**Government and financial actor support for increased accessibility of farmers to funding options.**
- Govt Ministry of Finance/Agri to support policy that allows for improved loan accessibility and interest rates
- Regional/Local development banks to deliver easier (perhaps community driven/mobile services) finance options for farmers and facilitate community level, basic financial training for farmers

**Service providers, academics and government extension actors to support and use the platform**
- Digital Service Providers to sponsor free SMS capabilities and network discounts to enable farmers affordable access to our network, thereby rapidly expanding our reach

**Universities and Researchers to analyze the relevance of data to inform further research and knowledge development**
- Government Ag Extension agencies provide basic data eg. # farmers / #women farmers / common crops / existing problems / evidence on effective strategies

**Engaged Farmers - on the ground - to understand and capture their stories, in order to share these stories to enlighten our potential stakeholders - thereby reducing the chain of communication and existing confusion.**
- Farming Community Leaders and Coop/Organizations to help organize communication efforts
- Farmers willing to share their stories
- Videographer/Writer to gather farmers unique stories to share with our stakeholders and also on our digital network.
Similar Solution in Action

Our research shows similar solutions. Some have implemented similar models at scale, and others offer services partially addressing the needs we identified. Our solution will be differentiated by delivering critical knowledge to small-scale farmers in the ACP region. We will link small-scale farmers to sources for inputs and financial services through our digital and community networks.

Existing solution example (linked):

- **WeFarm** provides a community network for 2.4 million farmers across Africa and Brazil, enabling them to access and share knowledge with each other and is planning to expand into a marketplace.
AGRICULTURE REQUIRES INVESTMENT NOT ONLY IN FACILITIES BUT PEOPLE.

Cohort Participation Countries

Cohort 14 | Upskilling Farmers through Education
15: Democratizing Food Systems Technology

Cohort Team Members: GlobalRise (John Casillas), Hello Tractor (Wambere Nyagah, Rispah Miliza), Farmers Hub (Kevin Wanambisi), Jim Robertson, AgroHive (Rebecca Adewole, Magalie Leclercq, Chiamaka Ndukwu), Ocean Mint (UK)Limited (Oloade Kumolu), AgServer (Chibuike Emmanuel), Annette Hakiel, Digital Gardener (Tone Graven), Farm Cheap (Ubio Obu), Farmeli (Uchay Ariolu). This Cohort was guided by Darío González.
We help farmers in vulnerable communities with crowd-sourced, mechanising field and research data, organized with artificial intelligence, that improves efficiencies with the right technologies, becoming a trusted resource that accelerates smart farming, builds new markets and establishes new economies.

The Need

Small holder farmers in developing communities are languishing today due to low rates of productivity, food insecurity, lack of market access, malnutrition and dramatic climate changes in their environment. It has been estimated that 60% of their losses are due to lack of the right technologies.

To fill this gaping need and empower these farmers, we are building a crowd-sourced, experiential, AI/data-driven advisory platform with strong community feedback loops, that places best practices around smart farming at their fingertips... bridging the gap for accessing technology and leveling the playing field.

Beyond funding our platform, we need your help to promote community awareness so we can collect information from surveys, census data and more. Uniquely responsive to Indigenous needs, our program addresses core challenges across global food systems and unlocks the potential of data and technology to generate positive systemic transformation one community at a time.

The Solution

Democratizing technology can profoundly change the way people see things. In fact, we are essentially co-creating new visions for small-holder farming communities, helping them to build nurturing and regenerative food systems with smart farming. By collecting crowd-sourced data, organized and delivered in a personalized way, our solution is game changing. It will help small-holder farming communities to build new markets, raise entirely new economies and promote confidence, trust and dignity in communities that are marginalized and vulnerable to external shocks like climate change, pandemics, war and more.
The Impact

Usable data with lasting impact is built from the ground up... and this takes time. In the building phase - where we collect Indigenous learnings and curate these with artificial intelligence-generated research - we believe our short term impact will be social cohesion. This occurs when farming families come together to discuss unique farming challenges and how they are surmounting them.

Long term, as results are published across communities, we envision wide-scale use of regenerative best practices that improve production and livelihoods, integrate subsistence farming with global food networks, improved gender inclusiveness in policy development, the formation of new markets and much more.

Working closely with a local university to collect Indigenous knowledge, and integrate it with evidence-based research, our medium term impact will be to apply crowd-sourced data to everyday challenges of farmers and provide road maps for achieving better results. We also gain sustainability from an army of students who work in our program - an alumni of “Food Systems Ambassadors” that can continue building new visions with democratized technologies.
Small-holder farmers in vulnerable communities will no longer be left behind or forgotten. Suffering from inefficient production that contributes to generational poverty and poor health, our solution positions rich streams of curated, actionable smart farming data that was previously inaccessible - both Indigenous and evidence-based learnings - into a trusted, crowd-sourced solution that empowers them, unlocking and promoting best practices that are both transformational and essential for building resilient, thriving economies.
**Turning Barriers into Opportunities**

**From Big Data to End-users:** Creating and organizing volumes of structured and unstructured data (Indigenous and research/applied data) into digital libraries that have easy to access and useful information. Dissemination of the findings will be a challenge given that a large part of our target has limited access to the internet and knowledge of digital tools.

**Systemic Barriers**

1. Gathering community co-created data and combining it with evidence from global institutions, using artificial intelligence, to deliver data that uses easy to understand tools like infographics and data visualization (i.e. USAID “agrilinks”); organized into discrete “helps” for small-holder farmers
2. Collaboration between teams of data scientists and research institutes/universities to build artificial intelligence models and produce insights from collected data;
3. Governments are planning infrastructure like 5G and broadband that bridge the digital divide, bringing access to internet/telephony
4. Partner with local actors (e.g. extension workers, state agencies, NGOs, universities) to disseminate our solutions to end users
5. Dissemination: solutions tailored to each target (e.g. voice to text capacity for linguistic barriers)

**Funding and Partnerships:** Our solution relies heavily on human, digital and hardware resources that could render it costly. Additionally, it involves the cooperation of stakeholders needed to collect, process and analyse the data. The success of this project depends on our ability to define sustainable business models around the content covered by our solution and sharing attractive ways to involve our different partners.

**Systemic Change Opportunities**

1. Finding partners that are building programs that can leverage our solution instead of reinventing the wheel. This will cut down mutual costs as we engineer social change.
2. Create sustainable business models around our solutions that fund existing and future operations and development
3. Support from non-profits and state/region projects for funding

**Overcoming the Status Quo:** Ingrained mentality and behavior is a main barrier for our solution. While our solution aims to merge Indigenous knowledge, research data and digital solutions, our target is largely not accustomed to new technologies so they need to be presented in a trusting way to overcome pre-existing conceptions and practices (e.g. widespread use of chemical fertilisers and pesticides).

**Overcoming the Status Quo:**

1. Reshaping farmers’ mentalities and behaviour through sensitizing campaigns, promotion and trainings on our solutions;
2. Community inclusion in ideation and solutions: Make use of an iterative, user-centered development approach which emphasizes end-user involvement to ensure the solution meets the needs of the users and eases the solutions’ implementation. Government and/or other partners can fund pre-scale, community co-created forums that help us to progressively build the final solution that has a manageable learning curve for the small-holder farmer (i.e., like providing phones preloaded with app, etc);
3. Showcase that our solutions are based on success stories to reassure our target.
Navigating Unknowns

Potential Unintended Consequences

Artificial Intelligence involves challenges, such as the risk of overfitting datasets, resulting in recommendations that don’t generalize well with new data inputs.

In a few cases, performance increase advice could produce less benefit relative to technology cost.

Our platform can disrupt power structures of traditional big technology providers causing ripple effects in financing (like lending institutions being nervous about technology they haven’t seen before) and farmer debt from technology investments can stress smallholders.

Thinking Ahead - strategies to avoid these consequences

Use the best machine learning training techniques and tools available, such as regularization techniques.

Use continuous improvement strategy to close the loop: Information on both success stories and less fruitful outcomes is fed back into our artificial intelligence engine to improve both (a) training data sets; and, (b) underlying assumptions of its model (in cases where outcomes failed to meet expectations).

The AI-based recommendation platform takes into account both performance improvement and cost, as well as what debt is manageable, thus helping farmers avoid runaway debt. We will teach lending institutions about our approach of continuous improvement via feedback mechanisms, and allow them open access to our performance progress information, thus building trust among both farmers and lending institutions.

Our initial thrust will be to source indigenous knowledge currently locked in silos, as well as modern farming data repositories to build Good Agriculture Practices. During this phase stakeholder involvement is pivotal for buy-in of the program. Their use of the product will fuel the success stories we need to progressively build our solution. This will involve project funding so we can engage Indigenous NGOs aware of existing social structures (leap-frogging time to develop).

Concomitant with funding, we need university partners to provide students that help with our initial database build. This includes curating Indigenous knowledge collected from village meetings and evidence-based research from around the world. These two streams of data, and perhaps others, will build our library that moves knowledge to actionable data for small-holder farmers. The university should have active programs in agronomy, nutrition and the arts (linguistic capacity).

We need technology partners, not necessarily in the farming sector, but with superior competency in artificial intelligence, human-centered App design, mobile telephony and more. Finally, we would like government sponsors from the outset to ensure our program resonates with critical policy considerations.
Similar Solution in Action

- In **Nairobi**, through creation and sharing of agronomy video content through a mobile application, we are offering farmers a helping hand in being informed, adaptive and smarter thus becoming more productive and economically uplifted.

- In **Kasese, Uganda**, by using synergistic farming and nutrition principles we have reversed the condition of stunting in two cases; and, are advancing an ICT/drone-enhanced food system with active community support that can transform food security, household income and mobility (access to market), health education and more.

- We have connected tractor owners and smallholder farmers in **Sub-Saharan Africa** through a farm equipment management and sharing application that reduces total cost of ownership (acquisition, maintenance, license and more) and enables them to earn more, increase production while building livelihoods and improving food security for their families and communities.
CREATING A SPACE OF TRUST BETWEEN FARMERS & TECHNOLOGY

Cohort Participation Countries
16: Scaling Controlled Environment Agriculture

Cohort Team Members: INMED Aquaponics (Unathi Sihlahla, Nancy Baker, Alexandra South), Eric Gontran, Wheeler Kearns Architects (Lawrence Kearns, Thomas Boyster, Michael Kendall), EnerGaia Pte Ltd (Bonnie Hobbs), Randi Drewry, Jardeim Design /ROOTLIFE (Khushboo Sonigera), Vungani Chirwa, Ralph Birkhoff, 10C Shared Space (Claire Richardson), Pauline Lingg, AYA Technologies Greenhouse (Barbara Molina, Evelyn Valencia), Oleg Ponomarev, Sachin Bhide. This Cohort was guided by Mihir Pershad.
Controlled environment agriculture (CEA) is resilient to climate change and increases food security locally and globally, while ensuring communities have sustainable livelihoods and fresh nutritious produce. CEA uses one-tenth of the water of conventional agriculture and leverages data to optimize yields and train next-generation farmers. When schools and universities engage with CEA, their communities gain a broad awareness of how food is grown, transported, and consumed. With this knowledge, communities tend to reduce food waste and increase acceptance of produce grown with CEA.

The Need

As climate change continues to disrupt traditional agricultural production, the need for alternative food production processes has never been more apparent. While Controlled Environment Agriculture (CEA) can be an important part of a resilient and nutritious global food supply, government policy, public awareness, and investment in this technology is lagging.

CEA has the potential to produce high-quality food close to consumers, using minimal water, yet government policies favor traditional farming and do not consider CEA in the regulations. Thus, CEA does not have parity with traditional farming subsidies. Further, there is strong resistance from farmers and the general public, who believe that food not grown in soil does not have proper nutrients. Relatedly, very few schools/universities have a curriculum to create awareness of how food is grown, transported and consumed. Moreover, the initial investment capital, knowledge, and skills needed for CEA setup is high, creating a barrier to entry for many interested in harnessing CEA as a sustainable food solution.

The Solution

Our solution promotes CEA by developing a platform to share data and conduct comprehensive CEA research, partner with public and private entities for funding, and collaborate with governments, NGO's, and traditional farmers to create a favorable ecosystem for CEA to thrive.

Our solution seeks to promote CEA in several pathways:

**MUNICIPAL:** Created partnerships and policies in city government to allocate 2% of city space for CEA

**SOCIAL MEDIA:** Ignite a social movement of urban home and community CEA gardeners through the creation of a media campaign.

**SCIENTIFIC EXPLORATION:** Establish CEA research institutes in all regions of the world.

**KNOWLEDGE MANAGEMENT:** Document CEA research and develop a library of knowledge to share ways to grow every consumable crop using CEA.

**EDUCATION:** Ensure that CEA is included in school and university curricula to increase awareness. It is vital to train next-generation farmers to use CEA technology and to encourage youth to adopt farming as an occupation.

**COMMUNITY FARMERS:** Fund community CEA farms through public/private partnerships with the goal of creating self-sustaining and profitable CEA farms and livelihoods. Encourage CEA adoption in regions where traditional farming and food supply chains have failed.

**TAX POLICY:** Secure support from regional land-use planners to create and administer CEA programs by offering subsidies, tax benefits, affordable crop insurance, favorable zoning and optimal land-use planning (and free land) to counter high initial CEA capital investment.
The Impact

Through rigorous data collection from operational CEA farms and research institutes, we can optimize CEA which we believe will have a myriad of short, medium, and long term impacts.

**SHORT TERM IMPACT:**
- Increased adoption of CEA adoption in urban areas
- Proliferation of innovations in high efficiency greenhouses
- Increased ability to farm in difficult and changing climates -- even in deserts.
- Increased awareness of CEA and how food is grown, harvested, transported and consumed.
- Increased awareness of healthy living instills a sustainability mindset.

**MEDIUM TERM IMPACT:**
- Increased access to locally produced nutritious food
- Increase in crop diversity -- including protein sources and
- Reduction in the amount of land, water and deforestation needed to produce quality food
- Increased acceptability of produce from CEA
- CEA farming is seen as an exciting and compelling career for our next generation of farmers.

**LONG TERM IMPACT:**
- Improve health
- Reduction in wasteful farming practices
- Reduced water consumption
- Reduction in urban food deserts through the creation of shorter food chains for fresher and tastier produce
- Reduced carbon footprint of cities
- Reduced farmer suicides.
# Turning Barriers into Opportunities

## Government Policies

- Favor traditional farming and do not consider CEA in the regulations. Currently, CEA does not have cost parity with traditional farming and hence its prices need to be regulated by the government. Traditional agriculture lobbies can affect government policies.

## Public Perception

- Is that food not grown in soil does not have all the nutrients. Traditional farmers are resistant to changing their existing ways. Very few schools/universities have curriculum to create awareness of how food is grown, transported and consumed.

## Lack of Initial Investments, Capital, Knowledge & Skills for CEA

- Supply chains, knowledge & community/ecosystem for CEA are still in early stages compared to traditional farming.

## Systemic Barriers

<table>
<thead>
<tr>
<th>Systemic Change Opportunities</th>
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<tbody>
<tr>
<td>1. Interview government officials and regulators from countries around the world and understand the current status quo, existing regulations and the advantages they bring to the food system.</td>
</tr>
<tr>
<td>2. Identify gaps in existing food systems where traditional agriculture has failed.</td>
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<tr>
<td>3. Pilot a CEA program to prove, document and advertise its advantages. Show the advantages of CEA with a measurable metric of certainty, quality, climate resilience and sustainability.</td>
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## Systemic Barriers

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<tbody>
<tr>
<td>1. Interview scientists and doctors from both sides of the argument for and against CEA. Compile the data and compare CEA with traditional farming AND with malnutrition or ill-nutrition in certain neighborhoods.</td>
</tr>
<tr>
<td>2. Work with schools and universities to include CEA and food journey content in the curriculum.</td>
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<tr>
<td>3. Involve local communities in growing food through government and NGO initiatives to create a sense of belonging to and through food and help communities become self-sustaining.</td>
</tr>
<tr>
<td>4. Begin a campaign (social media, film/TV series, podcasts and youtube videos) to demystify the perceived complexity and high costs and encourage people in urban environments to use CEA.</td>
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## Lack of Initial Investments, Capital, Knowledge & Skills for CEA

- Supply chains, knowledge & community/ecosystem for CEA are still in early stages compared to traditional farming.

## Systemic Barriers

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<tr>
<td>1. Speak to experts and successful businesses using CEA. Understand best practices, shortcomings and gaps in current knowledge base.</td>
</tr>
<tr>
<td>2. Set up a project to research each and every consumable crop and optimize its growth cycle for certainty in yield and quality. Use this information for educational materials and manuals documented on a website that can be advertised on the UN website.</td>
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<tr>
<td>3. Work with banks and credit unions to fund the initial investment for CEA through micro-loans.</td>
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## Navigating Unknowns

### Potential Unintended Consequences

1. In some markets, fresh produce is already very expensive, so CEA can be quite cost competitive by localizing production
2. Innovation is required to design business models, supply chains and logistics to reduce costs. Financial institutes should be swayed to provide low-interest micro-loans
3. Have champions become trainers via hub-and-spoke to become local supply aggregators & recruiters
4. Shorter supply chains

### Thinking Ahead - strategies to avoid these consequences

1. Negotiating as a pilot vs getting permanent change implemented
2. Using land in economically depressed neighborhoods as a way of revitalization, increasing the tax base for the community. For example, using CEA on some superfund sites as a form of remediation.

### Potential Unintended Consequences

A solution that depends on institutional & government support could get mired in red tape & action fails to materialize

High power use and capital intensity of upfront investment can create barriers to construction. Could outcompete CEA small-holders.

1. Conduct a market assessment to evaluate market potential of varying areas to promote investment
2. Could look to secure vacant and surplus land/building for free on tax base & workforce training arguments
3. Could use renewable energy sources like solar, wind, (nuclear?) etc to serve the higher demand
We are seeking partners in each of these categories to support various aspects of our solution:

- **Governments/NGOs/UN/Banks/Credit institutions and private companies:** Fund CEA research facilities for continuous improvement and data generation sharing knowledge worldwide. Provide favorable zoning policies, subsidies, tax benefits, affordable crop insurance, and low-interest micro-credits.
- **Public private partners:** Create sustainable business models and engage experts (researchers, architects, farmers).
- **Schools/universities:** Include CEA in the curriculum, raise awareness about how food is produced and distributed, and train the next-generation farmers using sound research and data and cutting edge technology to encourage youth to adopt farming as a livelihood.
- **NGOs:** Adopt CEA to bring local communities together for self-sufficiency and sustainable profitable livelihoods.
- **Private companies:** Partnerships with innovators will enable access to CEA technology.
- **Celebrity influencers:** Promote CEA through the media—TV, film, podcasts.
Similar Solutions in Action

Square Roots Farms is a for-profit business that uses CEA farms in a closed system (no sunlight, no contact to external elements). They collect data every time they grow anything, and that data is processed to generate knowledge for future growth. Their technology is climate independent and their system is robust, countering any weather disruptions.

Promisingly, they have halved the plant cycle for basil after only one year of research. Additionally, they work on optimizing the water and power usage to maintain the quality of the yield. Further, they live-stream video of plant growth for customers to boost education and raise awareness about how the CEA food they are eating is grown. Relatedly, Square Root Farms has a curriculum to train next-generation farmers.
REIMAGINING FARMING

Cohort Participation Countries

wkarch AYA DuocUCWAP Consulting Group

INMED Partnerships for Children Makalini FM Choice Meat Company Ltd

greysphere
green CUBE
17: Empowering Community Farming

Cohort Team Members: Greenvate (Adesope Afolayan), Adrick Brock, Nasaem Khair organization (Ahmed Ekzayez), Rolling Stalk (Caroline Batzdorf), Cynthia Simeon, Collaborative Innovation Lab, Anahuac Mayab University (Emilio Martinez de Velasco Aguirre), Kehinde Odanye, Kirti Patni, Aquatrap Project (Mark Algra), Loopfarms. Renewables urban farms (Mauro Barberis), African Population and Health Research Center (Michelle Mbuthia), Dufatanye Organization (Paula White Naiga), Seedibles (Samantha Eala), Simon Gooder. This Cohort was guided by Ivani Pauli.
FARMStory!: Unlocking Systems Leadership for Community Farmers to Better Feed the World

FARMStory! is a global community and movement using the power of storytelling to unlock systems leadership for community farmers. Story by valuable story, FARMStory! will create the conditions for new ways of collaborative leadership to emerge, galvanizing community farmers’ potential to drive sustainable transformation of our food systems worldwide.

The Need

Community farming is generally treated as a marginal form of food production and way of life. Community farmers are not recognized for the value they deliver within their immediate communities and regions, nevermind as part of the larger food system. FARMStory! will bridge that gap.

FARMStory! will connect community farmers through their own experiences, enabling them to find new ways of collaborating. FARMStory! will provide the platform for community farmers to advance shared goals, influence policy making, challenge the BigAg-dominated narrative, and collectively innovate around common challenges.

With adequate financing and partnerships to engage technical support and develop storytelling expertise, FARMStory! will create a platform for sharing community farmers’ stories of their successes and failures, their weaknesses, strengths, fears, challenges, and joys. Community farmers will connect with one another and with their broader communities through FARMStory!. They will harness the transformational power of community farming to drive sustainable social, environmental, and economic transformations of food systems, locally, regionally and globally.

Support from philanthropic partners and others will enable FARMStory! to develop a pathway that uses storytelling to empower community farmers, enabling them to go beyond their isolated experiences to develop and promote a more sustainable existence through systems leadership.

The Solution

FARMStory! is a global community and a movement with the mission of elevating the voice of community farmers and unleashing their potential to transform our global food systems.

To achieve its mission, FARMStory! will empower community farmers to share their personal stories and will amplify their voices through a collaborative, storytelling and advocacy platform that uses both digital and analog channels to reach a global audience. In doing so, FARMStory! will enable community farmers to connect with one another, exchange knowledge and experiences, and build solidarity networks to advance their causes.

Using the power of storytelling, FARMStory! will help community farmers see themselves as part of a whole system, despite their contrasting individual realities.

It will also enable community farmers to turn their individual struggles into new forms of collaborative leadership, catalyzing widespread action for systems change. FARMStory! aims to unlock systems leadership for community farmers, mobilize large networks of otherwise disconnected actors to work together in new ways to achieve a shared goal.
FARMStory! will work with community farmers in three stages:

1. **HARVESTING STORIES:** support community farmers in crafting their own story through a network of Story Harvesters.

2. **SHARING STORIES:** developing community farmer’s storytelling skills, sharing their stories in their communities, and recording them to be shared to a wider audience.

3. **AMPLIFYING STORIES:** Spreading community farmers’ stories through different strategies and channels:
   - **Direct amplification:** FARMStory!’s collaborative and interactive online platform featuring community farmers’ stories in video and podcast formats.
   - **Indirect amplification:** Working with media companies to replicate community farmers’ stories in TV and radio shows, newspapers, magazines, and social networks. Working with schools to share community farmers’ stories with kids and youth, as well as with journalists to cover news and write investigative reports related to community farmers’ stories.
The Impact

Storytelling can engender empowerment. FARMStory! will empower community farmers at the local, regional and global levels. The Iceberg Model of systems thinking helps to understand the solution we are proposing: change in mental models, structures, patterns and events will be evidence that FARMStory! is effective.

**EVENTS:**
Harvesting stories shows what is happening at the very local level, e.g., limited access to land, inadequate access to financing and insurance, vandalism, and violence. Community farmers’ stories, in isolation, are one community’s “events”. **Harvesting stories will shine a light on the visible part of the iceberg.**

**STRUCTURES:**
Enough stories reveal common challenges in a bigger system. FARMStory! will make it possible for the underlying structures to become apparent.

**PATTERNS:**
Exposing what might otherwise not be worrisome enough to pay attention to in a single event, FARMStory! will make it possible for community farmers to become aware of one another and the patterns in their common challenges.

**MENTAL MODELS:**
Networking through FARMStory!'s dynamic platform will enable dialog, and dialog will reveal mental models. FARMStory!'s networking potential will promote inclusion and will eventually facilitate systems leadership, allowing innovation to flourish.
As we develop FARMStory!’s pilot, we will work with “Story Harvesters” -- local volunteers with local cultural competence -- in different countries, to better understand cultural differences and overcome cultural barriers related to narrative building and storytelling in the context of community farming. This work will be key in developing FARMStory!’s methods and formats for crafting, capturing, and communicating stories. Subsequently, to scale up and expand FARMStory!’s reach, we will develop a training program for Story Harvesters. Using FARMStory!’s methods and tools, these local ambassadors will enable community farmers to join our movement, despite cultural barriers.

To overcome linguistic barriers, FARMStory! will seek guidance and support from organizations experienced in making content available in multiple languages, such as Wikipedia, Digital Green, and the like. We anticipate overcoming linguistic barriers by using a combination of the following:

- Employing local translators and linguistic experts.
- Developing a partnership with technology companies like Google, that can translate content to over 100 languages.
- Crowdsourcing the translation of FARMStory!’s content.

We will develop a pilot project in at least 10 different locations around the world in order to overcome methodological challenges. Applying the principles of agile development to this pilot, FARMStory! will refine its strategy of collecting stories, and will define the best format for communicating stories through appropriate channels to reach and engage a wide audience. Through this process, we will explore ways to overcome technical barriers in locations that have limited Internet access, like adapting and distributing content through TV, radio, and print media, and partnering with local organizations already working with farmers in remote locations.
Navigating Unknowns

Potential Unintended Consequences

Community farmers whose stories are included might attract more resources than those whose stories are not included, for whatever reason.

Participation in FARMStory! could provoke tensions due to divergent views or as some community members gain more exposure.

Exposure and greater awareness about community farming could exacerbate certain existing problems.

Partner organizations could bring both synergies and trade-offs.

Thinking Ahead - strategies to avoid these consequences

Democratizing the process and being intentionally inclusive at every stage could mitigate “unfair” advantages, especially where language and educational level are concerned. Local cultural competence will help, and FARMStory! can address limitations through specially designed training.

While this risk can be assessed by local Story Harvesters during the initial interactions, it may also be possible to harness the power of FARMStory! to resolve those very same tensions.

As more people are drawn to community farming, support, resources, and protections from the larger community will have to keep pace. FARMStory! can be aware of “too much of a good thing” in each context, and will seek relevant expertise as needed.

While the nature of the project might interfere with how politically neutral FARMStory! is, intelligence of local matters will be critical when determining the best partners.

We need the following types of support for this solution:

**STORYTELLING:** Creative organizations that have mastered storytelling for social change, e.g. The Moth, StoryCorps, Our Better World, Narrative Initiative, TED, IDEO.

**CROSS-CULTURAL COMMUNICATION:** Organizations experienced in working in different socio-cultural contexts and communicating across cultural and linguistic differences.

**MULTIMEDIA PLATFORMS:** Information and Communication Technologies (ICT) organizations, to develop multimedia platforms for both digital and analog content distribution worldwide.

**FARMING AND FOOD PRODUCTION:** International development, advocacy, community based and research organizations to help reach community farmers globally: e.g., FAO, WFO, IICA, NEPAD, CIMMYT.

**FINANCING**
To develop a prototype of FARMStory!
Similar Solutions in Action

Storytelling has been long used as a tool for social transformation, elevating the voice of marginalized populations, coalescing people around a common cause, and inspiring change.

Three examples of organizations that are using storytelling to transform food systems:

**DIGITAL GREEN:**
A global development organization that empowers smallholder farmers to lift themselves out of poverty by harnessing the collective power of technology and grassroots-level partnerships. It has facilitated the production and dissemination of more than 6,000 locally relevant videos in more than 50 languages.

**CIVIL EATS:**
A multimedia digital journalism platform dedicated to the American food system.

**FOOD SHAPERS:**
A collection of books documenting stories from 160 “food heroes” over three continents.
COMMUNITY FARMERS CAN CATALYZE FOOD SYSTEMS TRANSFORMATION
18: Building Resilient Local Food Systems

Cohort Team Members: National Capital Brewing Company (Michael Webb and Bryanna Millis), Regeneration Mauritius (Philippe Giblot Ducray), India Foundation for Humanistic Development (Nicku Abraham Mathew), Santa Food and Solidaridad (Evelyn Dias and Denis Oliveira), The Epamoolosa Coalition [Led by FoodNerve] (Adefolami Agunbiade, Ayo Popoola and Funmilayo Rebecca), Urbanico (Perla Hidalgo and Pilar Montaño), Learn to Earn to Own Community Project (Lieve Claessen), Social Gastronomy Movement (Nicola Gryczka and Megan Le Doaré), Humans for Food Alliance (Hubert Reyes), Biodistretto Valdera (Stefano Gonnelli, Francesco di Iacovo, Claudio di Silvestre, Guido Boella), Acterra; Action for a Healthy Planet (Nicole Angiel), African Population and Health Research Center (David Osogo), Reformaten (Johan Hjerpe), Common Roots Cooperative (Rachel Mazac), Ghana Food Movement (Aimée Wallin), Community Supported Healthy Food for All (Norah Sinclair), Market Cities Initiative (Kelly Verel, Kristie Daniel), Cooperative Development Institute (Emmy Andersson), Subzero Foods Networking Company (Bakare Abdulfatai Abidemi), Nomnom Food Design Lab (Vyoma Haldipur) ALL IN Eats Circular and Sovereign Food Economy (Whitney Francis), New Grocery Movement (Rebecca MacLeod), Utu Concept Lab (Ruth Jepchumba), MealFlour (Andrea Monzon), iFix Initiative (James Lual Akech). This Cohort was guided by Ivani Pauli.
We propose a Biodistrict Center of Excellence (BCE) - a self-governing, international body providing education, funding, technology, and resources - to support the bottom-up formation of local biodistricts and a resilient global network. Biodistricts are alliances of local food systems actors who agree on adopting regenerative agriculture practices to fulfill economic, environmental, and sociocultural aims and collaborating to enhance production, nutrition, jobs, and wellbeing for people and the planet.

The Need

The agroindustrial food system harms human and planetary health and separates communities from their cultures. Our call to action is to support biodistrict initiatives around the world to create regenerative, resilient local food systems. Their impact is limited by:

Inherent food systems inequality. Large companies, which are politically and financially favored, prioritize profit over environmental, economic, and health outcomes. Local, smaller farmers, distributors, cooks, craftspeople, and marketplaces are shut out. This power imbalance repeats at the local level where communities and consumers lack access to regenerative food and markets.

The siloed behaviour of system stakeholders is reflected in a lack of cooperation among local food actors and a focus on short-term benefits to the detriment of long-term sustainability. While fulfilling their individual roles (producer, buyer, seller, policy-maker), stakeholders often do not understand their interconnection to the larger system, nor can they envisage the benefits that would accrue through strengthened networks and a systems mindset.

Information gaps support the siloing of stakeholders as they remain unaware of innovations, resources, and the possibilities of change. Our current food system lacks a comprehensive and accessible platform for free and open information exchange to inform action, advocacy, and changes in consumer demand.

The Solution

We propose the creation of the Biodistrict Center of Excellence (BCE), an international support body that facilitates the creation and networking of local biodistricts towards the development of a resilient and regenerative global network of biodistricts.

Biodistricts are alliances - based on the principles of regenerative agriculture, circularity, and the SDGs - of local farmers, small/medium-scale processors/agribusinesses, food retailers/organizations, bioenergy producers, community/kitchen gardens, local governments, and consumers.

The BCE will provide access, through scaling partners, to educational, technical, and financial resources to support the formation of biodistricts. The BCE is an online platform operating through a decentralized network, accessible through a “low-tech high-touch” approach in partnership with local organizations where digital access is limited. The incentive in joining the BCE is the opportunity to access resources for biodistrict formation, funding, collaboration, and learning.
The Solution

We envision local food system actor engagement will unfold in 3 stages:

**SEED STAGE:**

Local food system actors come together in a bottom-up process as Seed initiatives. Upon first interaction with the BCE they are paired with an advisor to examine their needs and regional contexts, before connecting them with fellow Seeds and opening resource access. Cohort 18’s solutions will act as Seeds for the BCE pilot project.

**CLUSTER STAGE:**

Once participating members are formalized, Seeds advance to the Cluster stage where the BCE guides collaborative meetings to identify a shared vision and values, and prepares a needs proposal to identify the support required to grow to a Biodistrict.

**BIODISTRICT STAGE:**

Resources are made available in response to the needs proposal, including funding, expert support, education opportunities and the resources to host a food festival, which will introduce the Biodistrict to the community, promote business networking, and celebrate culture. The BCE also supports the Biodistricts to implement regenerative growing techniques and obtain holistic certification.

Finally, the global network links Biodistricts to one another, promoting cross-Biodistrict collaboration, sharing best practices, offering Biodistrict models for prospective Seeds and cementing a global network of thriving local food systems.

The end result is a systems change that shifts the balance of power in our global food system towards local actors through the creation of a resilient and regenerative network via BCE support.
The Impact

Our solution will catalyze the elevation of local food system solutions to their full potential, ensuring that the solutions that hold the best chance at mitigating agriculture-related climate change, regenerating ecosystems, ending food insecurity, upholding human rights (especially for marginalized populations), ensuring food sovereignty, honoring culture and producing high quality, nourishing food, achieve fruition.

In the short term, the problem of disconnected actors at the local level will be solved, as the BCE facilitates collaboration at all levels and encourages global networking and innovation to continue even after the biodistrict has been formed. Over time, collective power promotes locally driven systems change.

In the medium term, the BCE generates valuable education opportunities for its members to strengthen their solutions, as well as for the public to better navigate food systems by understanding the benefits of buying local, healthy food.

In the long term, the global food system will experience a shift in power from prioritizing large, often international actors towards local, community-based actors, as the BCE - a sustainable support body for local food system actors - equalizes the power imbalance within our food system and empowers local leaders.
### Getting buy-in and trust

From community food actors can be a challenge. Many involved in the food system will have been operating in a particular way for years - or even generations. For example, when promoting regenerative growing methods, and holistic certification, farmers may fear reduced yields and higher costs. These concerns and general discomfort with new approaches may cause various actors to resist.

### Logistics, specifically digital access and language barriers

Will be a challenge for the global platform to achieve impact. Lack of internet access, or lack of materials available in all local languages, could limit many communities’ ability to access the BCE, and thus make use of educational and support materials or engage in discussions.

### Lack of resources, specifically funding

Funding will be needed at both the global and local level for each biodistrict. Establishing the BCE requires the development and translation of materials as well as the implementation of a digital platform. For each biodistrict, meeting holistic certification requirements and restructuring elements of the food system will require investments.

### Systemic Barriers

- **a.** Identify incentives for individual actors to work together, in part through a demonstration effect of pilot biodistricts and use of BCE materials and networks, including a global educator network, to demonstrate benefits.
- **b.** Celebrate prospective biodistricts with community gardens, community kitchens, food festivals, etc. in which BCE and community members come together to explore the vision.
- **c.** Prioritize initiatives lead by or targeted to marginalized actors (women, Indigenous people, BIPOC), including those that promote Indigenous and local food culture and land stewardship.

### Getting buy-in and trust

- **a.** A “low tech-high touch” approach employs local biodistrict members to facilitate regular community gatherings at which to share information obtained through the BCE and elsewhere.
- **b.** Local organizations can be called on to provide different kinds of needed support (education, marketing, awareness, funding), with a special focus on bridging technology gaps (e.g. providing internet access in rural areas).

### Logistics, specifically digital access and language barriers

- **a.** BCE fundraises at the global level with support from scaling partners and the UN FAO network.
- **b.** BCE provides support and recommendations for the development of local resource banks and fundraising for prospective and established biodistricts.

### Lack of resources, specifically funding

- **a.** BCE fundraises at the global level with support from scaling partners and the UN FAO network.
- **b.** BCE provides support and recommendations for the development of local resource banks and fundraising for prospective and established biodistricts.
Navigating Unknows

Potential Unintended Consequences

Marginalization of rural areas and disadvantaged groups - The certification mechanism and requirement for a formal biodistrict in order to access funding - and challenges accessing BCE resources - may further stress marginalized groups.

Future dominating food systems actor - When there are many actors in a biodistrict, one or a small group of actors could eventually become dominant, reproducing the power imbalances we seek to dismantle.

Heavy load for lead representative of “seed” or cluster - This role could be a lot of work for the lead representatives, who are already heading their own organizations/individual solutions and lack time and resources.

Thinking Ahead - strategies to avoid these consequences

To mitigate, the BCE will offer educational and technical resources, and facilitate financial matchmaking, at the Seed level, ensuring that resources are accessible to actors that do not have the capacity or necessary environment to become a formal Biodistrict.

A cooperative governance structure will be suggested at local levels to allow for true economic and social democracy in the food system.

A robust support environment and a basic “seed” to cluster template will guard against overburdening lead representatives and incentivise development from cluster to biodistrict. BCE personnel could be assigned to each “seed” to ensure they are supported.

We seek scaling partners for guidance and financing to build out the BCE:

- Act as the initial “host institution” of the BCE, including personnel to carry out interactive duties
- Implement a digital platform to host the BCE and the global network
- Develop a pilot project for the BCE with Cohort 18 solutions acting as pilot “seeds”
- Provide or facilitate access to sustainable funding streams for the biodistricts delivered through the BCE
- Contribute educational, technical, technological, marketing/communication and political expertise that can be streamlined into service/program offerings through the BCE
- Build on experience to inform the development of the holistic certification
Today there are 26 established biodistricts in Italy.

1. The first biodistrict was established in the Cilento park, where the UNESCO heritage designated “Mediterranean diet” originated, 20 years ago. It now counts 400 farms and 2000 ha of cultivable land.

2. Following this experience, the Italian Association of Organic Agriculture (AIAB) formalized steps to move from a “seed” to a biodistrict and established an operating framework and statute. Today, AIAB is a national facilitator for new biodistricts.

3. Biodistrict Valdera committee was founded in early 2020 by a small group of organic food stakeholders. A participatory path of conferences and food festivals helped self-finance the “seed” and grow awareness within the territory and local administrations. Today Biodistrict Valdera is formally recognised, counting 60 members and sponsored by 9 municipalities. Biodistrict Valdera envisioned a Bio-districts Network and holistically certified food (ReFood), which by 2030 will replace the “Mediterranean diet” as the most nourishing, healthy, sustainable and just diet.

“Biodistricts have proven to be places with a culture of innovation, progressive improvement of agricultural practices, integrity and transparency, inclusive collaboration, holistic systems and pricing based on real costs, including the fair and dignified compensation of human commitment.” Stefano Gonneli, President of Biodistretto Valdera.
ENABLING BIODISTRICTS TO SPROUT THROUGH THE CRACKS OF A BROKEN GLOBAL FOOD SYSTEM
19: Enabling Affordable and Accessible Nutrition

Cohort Team Members: Zuhura Solutions (Lloyd Gitau & Benson Kibiti), Creating Pakistan’s First Tech Based Marketplace For Social Philanthropy (Musa Aamir), Food Multiproduction Unit (FMU) (Ramon Lameda, Victor Lameda, Carlos Lamed), Seeds Of Prosperity (Daniela Amir), Tailor Made (Taylor Quinn), Treble Drinks (Natasha Pencil), The Grocery Farm* (Ekua Hudson), Microgreens - Macro Impact (Siliyana Panova), Dairy Nourishes Africa (Dna)* (Mumbi Munene), Food Rx Deliveries (Nathan Zanzig), Root Tender (Christina Sewell), Fresh Produce Food Bank - Bite On That! (Jade Van Buuren), Affordable nutrition for all (Peter Goldstein), Buy2Thrive (™)* (Jessica Agnew), Tetra Pak (Rita Lousa, Disa Björklund), Reconnecting human health to environmental health (Afshan Omar), unBox (Isabelle Foster, Charlie Hoffs), Going Back To Move Forward (Garusha Jain, Priyanka Anand, Rajat Goel, Nidhi Kothari), Greensmooth (Nipitpon Tongpun), Me and Future (Kotoba Miki). This Cohort was guided by Janina Peter.

*Part of the original cohort but had to withdraw due to time constraints
To significantly reduce malnutrition by 2030, a holistic approach that leverages policy, community-oriented, and private sector solutions is needed. Our proposal offers two tangible ideas in each of these three pathways to ensure affordable access to safe, healthy, and sustainable food globally.

The Need

In 2021, nearly one third of the world population (2.37 billion people) does not have access to adequate food and approximately 800 million people face undernourishment, a level unseen since the turn of the century. At the same time, over 650 million adults worldwide struggle with obesity and the disease’s related chronic health issues. Recognizing the need for a radical transformation of our global food system, Cohort 19 developed a Solution Ecosystem encompassing policy, community-oriented, and private sector solutions to accelerate access to safe, affordable, sustainable, and nutritious foods for all people. These three pathways leverage the required innovations, services, open source knowledge, and technical expertise capable of reaching across disciplines, people groups, and previously disparate goals to achieve transformative access to affordable and desirable nutritious foods.

The Solution

Our solution uses three levers: cross-cutting policy, community-oriented, and private sector pathways, to significantly accelerate access to safe, affordable, sustainable, and nutritious foods for all people by 2030. To do so:

- **The first pathway** proposes the development of an open source knowledge platform and a policy guide searchable by the locality or country in question, which provides concrete figures on the true cost (leveraging ‘True Cost Accounting’ [TCA]) of a region’s food system and advises policymakers on policy, regulatory, and market/partner recommendations and case study examples to facilitate a more globally nutritious and secure food system from farm to fork.

- **The second pathway** conceptualizes the creation of a Food Systems Transformation Network, which comprises a digital platform as well as an in-person, community-focused hub model, featuring the exchange of open source technical expertise and tangible demonstrations applicable to the local context, integrating indigenous practices. The local and international vision of this network will help facilitate information sharing and spur a more resilient food system by engagement at the grassroots level.

- **And our third pathway** leverages the private sector to accelerate nutrition security and sustainability through the creation of an impact investing fund and complementary global malnutrition offset program that will guide sustainable financing and impact tracking. The offset program draws upon the success of the carbon credit model and can be applied towards supporting SDG 2: Zero Hunger.
The Impact

Our solution will have a long-lasting impact at the local, national, and international levels and will involve numerous stakeholders.

At the local level, our solutions can greatly expand local economies, deepen understanding of household nutrition requirements, and better direct international funding to local communities that bolsters activity at farmers’ markets, urban gardens, local food procurement contracts, innovation hubs, and other grassroots level programs.

At the national level, our solution will begin to bridge knowledge gaps and shift the way that policymakers and stakeholders calculate the full cost we pay for food in order to successfully shape more sustainable and nutritious economic and regulatory food incentives. It also allows for the private sector to benefit from malnutrition credit trading to raise funding.

At the global level, our solution will help address some of the inequities worsened by the Covid-19 pandemic and other unexpected shocks. By ensuring that governments, advocates, corporations, and even individuals have the tools and access to Total Cost Accounting (TCA) frameworks, community hubs, and investment funds, the global community can work together for systems-level change that is needed for a nourishing, equitable, and regenerative food system.
Turning Barriers into Opportunities

**POLICY:** A barrier but also an opportunity: For policymakers and stakeholders to begin to engage in a true food cost accounting framework and thereby reshape policies, incentives, and behaviors, it will require well-coordinated and concerted action from all actors in the system—federal, tribal, state, local, and territorial governments; investors; private companies; consumers; academics; and advocates. If not well coordinated, lack of knowledge sharing and synthesis of expertise could make national-level TCAs and follow-on policies difficult to execute, especially since most of the world’s largest economies have for so long misallocated subsidies and other incentives that prolong unhealthy and unsustainable food systems.

**COMMUNITY ORIENTED:** To realise this solution, stakeholders would have to come together within and between communities to increase accessibility and affordability of healthier, nutritious foods. Historically, bringing multiple sectors together to agree upon the best way forward to combat food security has not been successful due to varying thought processes and focal areas, and ultimately the lives of the most vulnerable populations are placed at risk. With this solution proposing a community-centred approach, it would be imperative for decision makers to work closely with community-based organisations, and address the fundamental issues surrounding mobilization of large scale behavioural change.

Key to overcoming the policy barrier is increased education of policymakers, stakeholders, and the general public which an engaging open-source knowledge platform with customizable policy solutions can begin to rectify. Increased understanding complete with policy insights from public sector practitioners from around the world can then beget more willingness to sponsor legislation, regulations, and market incentives that induce nutritious and sustainable consumption and production. Such policy recommendations may include: a malnutrition tax or nutrition subsidy, nutritious food healthcare deliveries, infrastructure investments in urban agriculture, consumer education campaigns, and more.

This solution will take a community-oriented, comprehensive approach aimed at improving livelihoods and accessibility to affordable and nutritious food for communities (urban/rural) that would otherwise struggle to afford healthier foods. It will do so by creating a Food System Transformation Network, which will comprise both a digital platform as well as strategically located, physical local-level hubs and educational centers. Together, these resources will provide technical expertise, functioning demonstrations highlighting a number of technologies and indigenous foods, living libraries, extension services, open source knowledge concerning nutritious foods, and policy recommendations that achieve impact across multiple themes essential for enabling access to affordable and desirable nutritious foods.
Navigating Unknowns

Potential Unintended Consequences

**POLICY:** With so much expertise and insight required for this pathway, there could be infighting among experts and a difficulty to synthesize everyone’s input. More of a risk than a consequence, there also remains the chance that despite the open access to the platform, adoption by policy makers will be low and may not translate to the desired impact due to strong vested interests in maintaining the status quo.

**COMMUNITY-ORIENTED:** Increasing access to healthier, diverse and nutritious foods while making them more affordable will require a thorough assessment of what nutritious foods are at a household level and in this case, redefining what constitutes food security at the grassroots level could disturb high level activities and project designs.

**PRIVATE SECTOR:** A potential consequence that could arise from the malnutrition offset credits solution is that companies might use and buy credits but not take other concrete actions to change their activities and expand their impact on improving global nutrition.

Thinking Ahead - strategies to avoid these consequences

These risks can be mitigated by inviting stakeholders across the board to use and engage with the TCA platform where they can add to the ideas around policy solutions and provide direct feedback that is visible to policymakers in a way that will help shape regulations, legislation, and partnerships with stakeholders across the food chain.

By using the solutions cross cutting approach involving multiple stakeholders via multiple platforms, the messaging describing the need to better understand nutritious food at a global level to improve malnutrition rates and health outcomes will be better received.

To address this, there could also be the creation of a commitment or pledge that companies could also take, which would require further action towards reducing malnutrition.
Implementing and scaling this solution will require the collaboration of a variety of stakeholders. To achieve the envisioned impact will require partnerships as well as financial and human capital resources globally. Specific resources vital for accelerating these ideas include:

- **Policy, community, technical and financial experts** who can assist and advise with the creation of a community hub, online databases, the development of a malnutrition offset program, and an investment vehicle.

- **Financial resources** will be necessary to fund the creation of the online policy database, the Food Systems Transformation Network, and the Impact Investing Framework and creation of the Malnutrition credits.

- **Infrastructure** will also be required to construct the physical Food Systems Transformation Network centers in different geographic regions.
Similar Solutions in Action

POLICY

Federal, tribal, state, and local agencies are prioritizing health, equity, and sustainability targets in their food procurement policies through true cost accounting (TCA) frameworks. Brazil, China, Indonesia, and others have applied TCA through the TEEBAgriFood framework to identify agricultural land-use policies that would benefit from ecosystem services such as agroforestry.

COMMUNITY-ORIENTED

Elements of innovative food hubs are being implemented globally to improve the livelihoods of vulnerable populations. Within Cohort 19, multiple members’ individual solutions on the ground work to raise awareness of sustainable production methods and link them to improving human health.

PRIVATE SECTOR

Environmental, Social, and Governance (ESG) investing has seen a meteoric rise in popularity over the last few years, in which investors globally align their investments to have social impact. In 2020, $51.1 billion dollars were channeled into ESG funds for the first time, an increase from $21 billion dollars in 2019. An example of an impact investing fund is Food Systems for the Future, a Chicago-based fund led by Former Ambassador Ertharin Cousin, and previous head of the World Food Programme. This fund identifies companies that develop, process, and support nutritious food and its access in the United States, demonstrating increasing interest in investing in equitable food systems.
CHANGING THE WAY PEOPLE UNDERSTAND & ENGAGE WITH FOOD
20: Incentivizing Dietary Shifts

Cohort Team Members: Akash Bikram Shah Sunar Swarnakar, Sabin Koirala, Sunita Bandane Pahari, University of Gothenburg, Department of Public Health and Community Medicine (Irene Blomqvist, Josefine Hagby, Leah Richardson), John Choi, Oluwatuyi Olowoyeje, Lucile Simon, Jainam Surti, Bono Salus Enterprises Pvt Ltd (Nyasha Denhere), Laura Fernandez, Alexandra Vela, Emma Jones, Maximiliano Juárez, Topcity Enterprises ltd (Victor Jummai), Tufts University (Eileen Kennedy, Katie Stebbins, Chris Economos), WildAid (Angela Kirkman), Collaborative Innovation Lab, Anahuac Mayab University (Emilio Martínez de Velasco Aguirre), Andrew O’Rourke, Jim Robertson, ADAS (Roger Sylvester-Bradley, Sarah Clarke), Mercy for Animals’ Transformation Project (Tyler Whitley, Susan Lane) Department of Plant Sciences, Quaid-i-Azam University Islamabad, Pakistan (Muhammad Zafar, Yaseen Ghulam). This Cohort was guided by Janina Peter.
Sustainable, Healthy Eating & Food by 2050 (SHEF Shift Challenge)

SHEF is a challenge campaign with incentivization to encourage global adoption of sustainable plant-forward diets. The campaign will challenge people and organizations to shift toward plant-forward diets across the food chain, from farm to fork. The campaign is supported by an easily accessed “Transparent Food Intelligence System,” which is a comprehensive education platform that will provide reliable, accurate information about food choices via multiple outreach channels (apps, celebrities, recipes, testimonials).

The Need

From farm to fork, today’s global food system causes massive public health, socioeconomic, and environmental problems. Plant-forward diets would go a long way towards mitigating all three, but getting people to make those changes has been difficult — and that’s where we come in.

We need a shift towards plant-forward diets to improve health - unhealthy diets are the leading modifiable factor causing poor health globally. Our goal is to empower farmers, manufacturers and consumers to shift to healthier foods to improve everyone’s health. This will also decrease health systems costs, benefiting local communities and beyond.

The Solution

To achieve our goal of incentivizing plant-forward diets, we will empower individuals with access to reliable, concise intelligence about the impact of their dietary choices, then further incentivize habit change using a multi-platform challenge campaign (SHEF Challenge). We use different existing resources and methodologies, such as the FAO-WHO Sustainable Healthy Diets and True Cost Accounting to support the promotional and monitoring components of the challenge campaigns.

Our solution leverages the creation of a comprehensive education platform or “Transparent Food Intelligence System”; providing reliable, accurate information about food choices via multiple outreach channels (apps, celebrities, recipes, testimonials). Presented as a challenge, and promoted through large-scale campaigns to motivate people to change their behaviour, millions will be inspired to make healthier and more sustainable choices.
The SHEF Shift Challenge is about empowerment. Through the potent pairing of relevant storytelling and useful knowledge with policy change, we envision a future where it is easy, affordable — and natural — to choose plant-forward diets.

Evidence tells us these changes will lead to:

- healthier communities in
- socioeconomic improvements
- a multitude of environmental improvements

We believe **consumers**, touched by our campaigns and armed with our intelligence, will choose to eat more plants.

We believe **farmers**, impacted by the market shifts we drive and opportunities we reveal, and equipped with the knowledge to execute, will opt-in.

We believe **policymakers**, seeing the constituency transformation and persuaded by the benefits we highlight, will remove artificial barriers to healthy, sustainable foods, making shifts easier for future generations.
At its core, we hope the SHEF Shift Challenge will drive global dietary shifts, enabling people not just to make the best choices for themselves, but also for their communities and the planet, and further empowering them to influence others in every corner of the globe, making this a truly worldwide shift.
Turning Barriers into Opportunities

**Cultural inertia** - inherited or familiar tastes and cuisine, established cultural, lifestyle, and landscape value of meat, dairy, fish and egg production and consumption, culturally important staple crops or foods, mindsets that meat, etc. provide the protein we need, dislike of change, unknown or misunderstood incentives for change and high awareness of difficulties or inconvenience of change, etc.

**Economic threats** - existing investments and commitments to animal-derived foods, opposition to change, fear of lost capital, lost income and lifestyle, lack of alternative land uses or local employment, or costs of retraining and relocating workers, and repurposing infrastructure, etc. at all scales from small businesses to nations.

**Weak public prioritization of diet** - low public concern about dietary issues (cf the economy), allowing public support of unhealthy and/or unsustainable food production and consumption - inadequate public and government recognition and education about healthy diets, subsidization of unhealthy foods, animal feed crops, and animal producers, and under-subsidization and under-promotion of healthy diets, hence poor availability and higher prices for healthy options.

**Systemic Barriers**

**Systemic Change Opportunities**

Launch a high-profile public challenge for a global SHEF shift by 2050. Targeting the public through influencer-supported campaigns including education and incentives to eat SHEF. In pilot nations campaign to include a series of SHEF articles to be rolled out every 60 days highlighting ways to “shift” and promoting examples of successful change. Distill ‘SHEF’ into composite attributes that address impacts on human health, climate, water quality, air quality, biodiversity, and socio-economics, and institute a transparent food intelligence system. Provide support for an easy transition to SHEF eating through a user-friendly education platform including recipes, apps, and rewards.

Use public finance to support the SHEF diets of poor people globally. Create and highlight alternative, economically sustainable business models and income streams for farms and businesses impacted by the global SHEF shift. Emphasize that ‘food with data’ has more value than mere food. Highlight opportunities for farmers to remain independent and tap into local markets (directly from farm to fork). Prepare the food industry for changes in consumer demand; food corporations will see inevitability and competitive value in maintaining openness about ingredients and processes (hence health attributes).

Highlight potential commercial opportunities of SHEF diets to farmers, small rural businesses, the environment, workers, consumers, and politicians. Document and publicize the true costs of foods, including societal costs (human health, economic, environmental) of eating unhealthy foods. Implement this publicity across the whole food supply chain to make the various costs and benefits of foods transparent to everyone.
Navigating Unknowns

Potential Unintended Consequences

**Economic disruption**: loss of jobs among livestock producers and their communities dependent upon industrial animal agriculture.

**Deficiencies** or shortfalls in essential amino acids (EAAs) and vitamin B12

**Cultural let-downs** (e.g. holiday feast traditions, disappointing taste, and texture, etc.) might impede change

Thinking Ahead - *strategies to avoid these consequences*

Governmental support for retraining and job transition, plus livestock-to-plant-farming private initiatives (like Transformation).

Develop cuisine using complementary plant proteins (grains and pulses) or protein-complete plant foods, like soy, quinoa, amaranth, and mushrooms, or fortify staple foods with EAAs produced by fermentation.

B12 is provided via certain fermented plant foods, laver, and supplements. (bread leavened with starter cultures containing B12-producing Emmentaler strains have great cost advantage: starters can be distributed, person-to-person at virtually zero cost, across regional populations for perpetual use. Fermented grain B12 quality can be optimized via Nutri-Know grain cobalt content assays.

Feasting on special occasions is acceptable if animal consumption on normal days is reduced. Campaigns can energise abilities to develop convincing meat substitutes e.g. Impossible Burger, and create new markets.

The SHEF Shift Challenge is ambitious and so will require extensive support and multiple resources.

- **Subject matter experts** to set national dietary guidelines, review and publicize the True Cost of Foods, plan campaigns, analyze expected market impacts, forge partnerships with NGOs and businesses
- **Broadcasters, event planners** and influencers.
- **Tech company support** in building the Transparent Food Intelligence System, including funding for a prototype.
- Governments should redesign **trade agreements**, support taxes and subsidies for SHEF, set advertising standards, regulate carbon markets, and arrange microfinance for farmers in developing nations, in partnership with businesses.
- An **Intergovernmental Panel** must own, regulate, and monitor targets.
- **Schools and colleges** must provide education, including retraining of workers displaced by SHEF Shift.
Similar Solutions in Action

**CHINA**

Through high impact mass media campaigns incorporating education, cooperation with local partners including the government, and celebrity ambassador support, cohort members have successfully promoted successful dietary shifts towards plant-forward diets to over 300 million consumers.

**UNITED KINGDOM**

Through networking farmers to analyze harvested products (grains) and share the results through a crop information system, ADAS has successfully enabled hundreds of farmers to recognize crop nutrient deficiencies and thereby improve the productivity and sustainability of their crops.

**ZIMBABWE**

The president urged the population to shift to more plant-forward diets during a speech at a rally, giving tips on types of vegetables to favor, but was met with resistance from the local population. However, the government initiated a policy of requiring food processing companies to fortify their products and label products as being fortified, e.g. “fortified maize meal”, and the result has been that companies are embracing this policy.
TO GO FAST, GO ALONE; TO GO FAR, GO TOGETHER.

Cohort Participation Countries
Cohort Team Members: Além da Fome (Rogério Silicani Ribeiro and Renata Luciria Monteiro), American College of Lifestyle Medicine (Samantha Gallion), BCA Global (Chef Alex Askew), Beyond School Bells (Dakota Staggs & Max Cuppens), Canadian Food and Wine Institute at Niagara College (Amy Proulx), Eatable (Merissa Lam), Humane Society International/Canada (Natalie Chatterton), International Confederation of Dietetics Associations (Liesel Carlsson), LabelBlind® (Rashida Vapiwala), La Tablée des Chefs (Lyndsi Daubricourt), MaxMORIX EXPERTS (Donald Max Henzi and others), New York Sun Works (Manuela Zamora), Sow The seed Africa (Nelson Petro & Restituta Sawaya), Systems Living Labs (Hana McMahon-Cole & Christine Tan), The Good News Foundation (Jannie Wolff), Wageningen University & Research (Judit Snethlage, Hanneke Heesmans & Marijn Gülpen). This Cohort was guided by Maame Ekua Manful.
**The Need**

Communities are disconnected from their food, and this has major health, environmental and social consequences. Access to healthy food is inequitably distributed and influenced by social determinants of health. Diet-related chronic disease is a major global burden. Further, our food systems are major contributors to environmental degradation, and lead to, for example, a culture that allows food waste at all levels of the food systems. People desire to eat healthier, more sustainable diets but often lack the resources, power, information, and skills to support such choices.

Food literacy is an emergent concept connecting food-related knowledge and skills for sustainable, healthy diets. Multidimensional food literacy promotion is vital for the well-being of children and families. Education and communication about healthy food systems leads to improved health and a better quality of life in the community, and globally!

We need influential partners who have the power to bend the ears of national governments; who can provide access to exceptional communications technology and scale capacity to reach all children, families, and their communities. We need experts in evidence-based curriculum across learning environments, and exceptional community developers to engage all stakeholders. Our project must have a global character that can be locally anchored.

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**The Solution**

We are proposing to close the gap between people and their connection to food and food systems. We will focus on children and their advocates (families, communities, elders, teachers, health care workers, etc.), and through the development of transformational, globally connected, locally implemented curriculum and learning programs, we will develop a generation of food literate food citizens. The programs will take place in schools, because of the systemic leverage potential, or any setting where youth and their advocates gather (community centres, churches, after school programs, etc.), because where meaningful learning happens varies by community. We will use a train-the-trainer model, where highly trained staff, with access to exceptional resources, will train community partners to implement the program at a local level.

We have a four pronged approach to success: To gain buy in on a global level, a core team will build structural support through government engagement, alongside influential partners, to bring decision makers up to speed on the scope and relevance of food literacy. Another core team will be building a curriculum library for teaching and learning tools as well as support resources for successful implementation. Another team will be building a communications and behaviour strategy.
The Impact

Our solution is intergenerational, shifting the way youth and their advocates think about and value food, creating a critical mass that can drive systemic shifts for sustainable and healthy food systems. This solution has the potential for creating networks of communities with newfound ownership in their local food systems. This power could create the conditions for shifting policies and systems that perpetuate sustainable food systems into the future. Food system workers are systemically undervalued.

We envision that jobs will become better paid and more sustainable throughout the food system, and food literacy across generations will drive markets (e.g., agrifood industry) to respond to new demands.

This will create a larger shift and more availability in healthy/environmentally friendly products in the market.

Such shifts will lower environmental impacts of food systems, and increase wild and biodiverse landscapes.

Good nutrition is also related to school performance, work capacity, and potential to contribute meaningfully to livelihood and community development. This effect is intergenerational, as nutrition status affects the capacity and potential of the next generation through fetal development.”
The primary barrier to achieving sustainable food systems is **lack of knowledge**. Food production, selection, and preparation are deliberate skills. Over the past century, industrialization, labour specialization, and urbanization have accelerated detachment from food skills. Generations of deskilling has accelerated knowledge and skill loss, which is disempowering. It leaves gaps for misinformation to creep in unquestioned, and for industry to craft messages that fill those gaps. For example, marketing influences children and families towards unhealthy dietary practices, the industrial food sector has taken a dominant role in school-based nutrition messaging, and social media manipulates food and nutrition messages.

Secondly, while food is a common and necessary good, most nations do not govern to protect sustainable, healthy food systems, or to support food literate consumers. In a cultural landscape that values freedom of choice and the market, consumer choices are most often based on convenience, cultural preferences, and affordability.

Finally, we acknowledge that poverty is an urgent barrier to accessing healthy and sustainable food. Any educational strategy must be built around local context. Teaching and learning activities for food literacy must be appropriate to the population and feasible to apply for the lessons to be meaningful.

Our solution systematically integrates food literacy into our knowledge base, with children and their advocates as our main focus. Our accessible, evidence-based curriculum is directly integrated into school and community education programming, promoting access to as many global children and communities as possible. To promote adoption of the program by a wide-scope of partners (whose resources may vary significantly), we advocate to help governments prioritize and implement our work. We create support networks through train-the-trainer models and local advisory boards. To address power imbalances in who shapes the food system discourse, we provide public relations and communication resources.

Our initiative advocates to govern to support food literate populations by encouraging systematic adoption in school and community programs. While broad and principle-focused on a global level, the initiative supports adoption and adaptation at the local level (e.g. community educators working with local chefs to bring to life food knowledge and skills at schools) such that local cultural values can be owned and integrated. To promote food literate consumers, we aim to enhance knowledge and skills to critically evaluate nutrition information and act for the best outcomes for environment and health, while respecting individual free choice.

We do not pretend that education alone can overcome income-related access issues, or influence high-level agricultural commodity subsidies. Our focus is on food literacy, and knowledge equals power. We aim to make this program free, and include advocacy for change as part of the curriculum and learning activities. We acknowledge that our work dovetails with many other cohorts and groups around the world that are working on systemic change in this arena.
Navigating Unknowns

Potential Unintended Consequences

Victim blaming or shaming: we do not intend to create conditions that shame families who cannot afford healthy, sustainable food. And yet, our initiative is not intended to address power inequities.

Lost-In-Translation: using a train-the-trainer model may result in variable program quality at the local level. There is also the risk of debates about core concepts and how to translate.

Fantastic but underutilized resources: we hope not to create fantastic resources that do not gain traction, or fall out of fashion in a short time.

Theoretical but not practical: we need to transform our content into practical actions adapted at the local level. If we focus excessively in concepts we may become a lost white paper on sustainable, equitable, healthy, socially responsible food practices.

Thinking Ahead - strategies to avoid these consequences

Facilitators familiar with community SES would inform local implementation, and can facilitate community partnerships to facilitate access to healthy, sustainable food, and our curriculum will also include powerful modules to learn about advocacy, which can support change in the long run. Further, we don’t want to place the burden on youth; our advocacy tools can help policy makers understand food insecurity.

Regular training, mentoring, and feedback sessions between facilitators and with the organization will help to mitigate this, as will valuing of local knowledge.

To address this, any efforts have to be supported by skilled and permanent staff (no short term grant-based employees!). These staff facilitate advocacy, uptake, teaching, training trainers, and constant updating as sustainable/healthy diets/food literacy are all hotly dynamic topics.

Food production, consumption and preparation demands practical instructions!
We are a cohort of well-connected professionals with expertise in education, curriculum innovation, community engagement, food system technology, and other mission-relevant fields, with representation across five continents. In order to launch our transformational idea, we need some initial scaling partners, to get this idea off the ground. Further partnerships will develop at later stages.

We are looking for scaling partners who can help us
- Develop the structural support: the compelling story (evidence) that convinces governments and local partners/funders to make this happen in their jurisdictions.
- Fund a sustainable, high-quality and impactful initiative. United Nations Development Program, World Bank, agriculture and food system industry, or seed funding from National governments. We are cognizant and attentive to potential conflicts of interest in funders, and will have robust mechanisms to ensure this process does not interfere with the core principles of our initiative.
- Connect us with food, nutrition, health and sustainability experts in the field who can work with us to scale up and out our resource library and implementation capacity (See Miro Map): Food, Medical and Dietetics Associations, Education International.
- Excel at food and nutrition communications.

GLOBAL SUPPORTERS:
UNESCO, FAO, global organizations involved in youth food systems training (e.g. 4H, Slow Food International, Agricultural Cooperative Extension, World Food Prize Youth Institute, YPARD) and education (e.g., Education International) can help us with scaling up and reaching out through their existing networks, infrastructure, and content. Agriculture and agri-food industry stakeholders; the United Nations Development Programme, World Bank can help us with funding needed to scale up and reach out effectively on such a broad scale.

NATIONAL SUPPORTERS:
Government ministries of education, agriculture and health are necessary allies to help us through supportive policies (e.g., adopting/inviting our program); nutrition, health and wellness initiatives from private and public sectors, (e.g. Dieticians associations) are key allies who can help develop content and reach communities; political organisations (e.g. European “Green”/left Parties) can help share messages about the rationale; corporate organisations committed to making positive change, and foundations focused on health, education and literacy can help to fund localized action in the delivery of the programs.

LOCAL SUPPORTERS:
School districts; allied after-school programs, local chefs and culinary community; organic farmers’ organisations, regional Indigenous communities/organizations, community development and outreach organisations are all critical in local implementation of exceptional, experiential and locally meaningful learning experiences.
In Japan, school-based food and nutrition education is mandatory and strongly integrated with families. Schools have nutrition-trained educators facilitating their food programs, and strong values regarding healthy and sustainable food are integrated into public policies. The Japanese diet is known for both health and sustainability. Japan is the only country that has managed to level out the rise in obesity levels.

In the United States, nutrition education is mandatory in public schools, and there are excellent examples of community-based nutrition programming that supplements this work. Community educators engage children and communities in urban agriculture projects, and connect with local farms and chefs to make food literacy come alive!

In Catalonia, Spain, food policy supports excellence in nutrition education that leads to improved food choices among children and adolescents. World-famous soccer players promote local healthy food consumption in television advertising, school canteens reduce food wastage, some purchase directly from local farms, and students practice food shopping in supermarkets that have special places for local natural ingredients while learning local cooking based on their traditions.
Cohort 21 | Building Food Literacy Through Education

ENABLING TECHNOLOGY TO CREATE SPACE OF TRUST BETWEEN FARMERS
22: Mainstreaming True Cost Accounting

Cohort Team Members: Zero Foodprint Asia (Peggy Chan, Joel Tomas), HowGood (Christina Lampert, Joao Brites), Danone (Damien Jourdan), Capitals Coalition (Isabel Hoffmann), Sofia Moreno Cesar, Future of Food (Jenn Yates). This Cohort was guided by Simona Grande.
**ACTonTCA** is an education program for procurement specialists. Our aim is to make true cost accounting (TCA) actionable for these key decision-makers within the food system. ACTonTCA will socialise the concept of true cost accounting, with the ambition of rapidly scaling up this approach that includes the values historically excluded from decision-making processes.

**The Need**

The modern food system feeds health, environmental, social justice, and economic pain points. As awareness of these pain points has increased, businesses are rising to the challenge of improving our food system.

Stakeholder understanding of the full impact and dependencies within the food system is still immature. Historically, measurement of agricultural success has been based solely on productivity and margins, largely ignoring the hidden costs of the food system and missing out on accounting for potential benefits. Because of these factors, decision-makers are not likely to consider the externalities of their decisions.

Despite work undergone through initiatives to scale TCA, the framework has yet to pass the tipping point whereby a standard method for TCA emerges. This undermines TCA’s adoption across the food industry and favors the status quo.

ACTonTCA acknowledges the urgency of aligning food system stakeholders around a shared understanding of costs and success. By leveraging existing frameworks and incentivizing organizations to pilot ACTonTCA we can accelerate TCA adoption and thus drive towards the TCA tipping point and identification of a unified standard. By indexing on speed of adoption we can streamline the application of TCA, aggregating new data from the field to progressively extend the reach and depth of TCA assessments. Over time, nuanced frameworks and guides can be sequentially developed to serve a wider breadth of use cases and stakeholders.
ACTonTCA is an education program for procurement specialists. Our aim is to make true cost accounting (TCA) actionable for these key decision-makers within the food system.

**ACTonTCA will socialise the concept of true cost accounting, with the ambition of rapidly scaling up this approach that includes the values historically excluded from decision-making processes.**

The modern food system feeds health, environmental, social justice, and economic pain points. As awareness of these pain points has increased, businesses are rising to the challenge of improving our food system.

To optimize for better outcomes of the food system, including promoting environmental regeneration and improving livelihoods, ACTonTCA:

1. Equips procurement specialists with the skills and understanding to apply TCA in their decision-making
2. Pilots the approach to demonstrate the business case for TCA
3. Creates an educational guide accessible to decision makers in business, finance and policy to comprehend and take action toward the concept of TCA
4. Enable decisions makers to realize the value it has for a socially just, nature positive food system

Addressing these needs requires sponsorship for the following activities:

- **Design Research** to understand procurement specialist decision-making processes and success metrics and align existing TCA frameworks to procurement processes
- **Development of Educational Guide Content** and supporting tools and collateral
- **Creating Accountability Structures** through gradual implementation of regulations that require internalization and disclosure of external costs, thus creating incentives for TCA adoption.
- **Elicit Support** from executive leadership at prospective businesses to pilot ACTonTCA.
ACTonTCA paves the path for rapid adoption of metrics and toolsets that ultimately improve food system external impacts. Our solution accelerates TCA adoption through creation of incentives and accountability structures and optimizes outcomes by aligning stakeholders around one definition of success that considers external outcomes. Adopting TCA enables businesses to measure their impact and identify opportunities for improvement, such as selecting ingredients from regions with sustainable agricultural methods, lower usage of exhaustible resources, promotion of soil health and biodiversity, and celebration of land equity and labor ethics. As the understanding of TCA and external cost drivers matures, businesses will be motivated to incorporate TCA into their profit & loss (P&L) statements, ultimately internalizing the costs. Notable cascading effects will include corporations investing in the transition of farms toward regenerative practices and an effort to innovate toward alternative business models. Companies can also compound on these efforts by marketing positive externalities to the end consumer.

As previously mentioned, ACTonTCA aims to enable businesses. A notable example of TCA in action by Tony’s Chocolonely. Their efforts demonstrate that incorporating TCA can lower external costs as well as increase productivity without impacting the end cost to the consumer.

By leveraging existing frameworks and incentivizing organizations to pilot ACTonTCA, we can accelerate TCA adoption and thus drive towards the TCA tipping point and identification of a unified standard. Ultimately these efforts can help align stakeholders around the metrics by which we can measure food system success and enable stakeholders to promote measurement of progress towards sustainability metrics.
TCA is Complex: The complexity of the food system and the proliferation of TCA frameworks and methodologies with varying definitions and metrics poses a barrier entry for businesses seeking to conduct holistic assessments of their positive and negative impacts. This complexity and lack of harmonized standards between frameworks poses a challenge for external stakeholders to hold businesses accountable for their claims. As a result, despite increased desire to invest in sustainable food production, businesses lack the understanding and tools to apply and measure TCA.

TCA Lacks Enforcement or Incentives for Rapid Adoption: Key stakeholders are not familiar with TCA, the problems that create the need for TCA, or the benefits of adoption. Further, stakeholders likely have conflicts of interest that undermine the growing concerns around the external costs of food as well as the efforts of small farms to scale nature-positive food production. Challenges include corporate and government links to agri-food businesses and lobbyists as well as food businesses who largely benefit from the accessibility of cheap commodity products grown conventionally, are unlikely to widely adopt TCA.

Systemic Barriers
Systemic Change Opportunities

Tackling Complexity:
ACTonTCA leverages targeted research design to accelerate understanding of TCA and its application. Building from existing efforts by the TCA Community of Practice to develop harmonized TCA principles, definitions, and metrics, we aim to make the complex simple by creating streamlined methods and educational content aimed at procurement specialists to reduce friction across the TCA assessment, interpretation, and reporting processes.

Creating Structures for Transparency:
By connecting decisions to impact, ACTonTCA increases transparency across the supply chain making it possible to regulate environmental, health, and societal impact through TCA adoption and measurement.
Navigating Unknowns

Potential Unintended Consequences

Lack of a business case if ACTonTCA pilots do not consistently result in positive financial outcomes for businesses. For example, in order to be willing to decrease profit margins businesses have to either make up the cost elsewhere (e.g., increased demand or revenue) or feel pressure (e.g., consumer and media pressure coupled with government sanctions).

Redundancy of efforts if we do not properly leverage existing research and TCA frameworks.

Low solution-fit for users if we do not identify and recruit the necessary research participants to inform our use cases and educational content development.

Thinking Ahead - strategies to avoid these consequences

We will look to external factors and potential partnerships to help demonstrate the value of TCA. e.g., Creditors are now willing to lend at lower rates to companies that demonstrate progress in reducing CO2 emissions and water consumption, make a positive social impact, and generally meet other social and environmental goals. Movements like these help demonstrate the value of measuring external impacts through TCA in order to report on progress.

We understand that many efforts have been undergone and businesses are working on aspects of TCA. Our aim is to leverage existing effort and tackle the largest barriers to rapid adoption to scale TCA.

With the support of design research specialists, our approach will map our scaling hypotheses to a comprehensive research audience revealing and validating user needs, priorities, pain points, and demand signals in order to help us prioritize the most relevant use cases.

Resources needed include financial sponsorship, partnerships, and policy for the following activities.

1. Design Research to understand procurement specialist decision-making processes and success metrics and align existing TCA frameworks to procurement processes
2. Development of Educational Guide Content and supporting tools and collateral
3. Eliciting Support from executive leadership at prospective businesses to pilot ACTonTCA.
4. Mainstreaming TCA (future)
Similar Solutions in Action

1. **Tony’s Chocolonely** implemented true cost accounting with the aim of measuring and reducing forced and child labor in child production. Apart from striving for 100% slavery-free chocolate, Tony’s Chocolonely set quantifiable goals to provide farmers with livable incomes and prevent or compensate carbon emissions. As a result, Chocolonely was able to measure and report on strong improvement in labor conditions, productivity, living income, deforestation, carbon emissions, land use, water pollution, and soil pollution. **Notably, by increasing its awareness and incorporating TCA metrics, Tony’s Chocolonely achieved improvements to true costs without raising prices for consumers.**

2. **Danone’s** R&I team members leverage HowGood’s ingredient impact platform to consider the trust cost of their ingredient selections during product formulation phases. HowGood reports on metrics like biodiversity impact, labor risk, working conditions, land use and more for over 33,000 ingredients, chemicals and materials to make the philosophy of TCA accessible to any food company wishing to incorporate.

3. **Penny**, a German discount grocery store partnered up with researchers to calculate the true costs of eight of their products. By true cost accounting calculations, the price of conventionally farmed meat rose 173%, even organic meat more than doubled in cost. Conventional and organic milk increased 122% and 69% in price, respectively.
ACT on TCA IS A WAKEUP CALL WITHOUT A SNOOZE

Cohort Participation Countries

The Food For Thought Foundation, Inc.

Fair Planet

Zuhura Solutions
23: Making Markets for Farmers

Cohort Team Members: Allin Natural (Mariela Salazar, Namita Gurudas and Emma Moore), Umoya Foods (Chelsea Paull, Anissa Davel), 1-2-Taste, Solidaridad, ProFound partnership ’Connecting the Dots (Jasper Schouten (1-2-Taste), Bert-Jan Ottens/Faye Hartman (ProFound), Monique van de Vijver (Solidaridad Network)), Food Share (Soma Ramalingam, Rachael Hoover, Sophie Viandier), Community harvest register (Mulilo Chuula), Pivot Projects (Colin Harrison), Agtool (Martha Montoya), Terra Emerald (Liz Maina), Nampya Farmers Market (Mark Matovu), Fantine (Laura Amado). This Cohort was guided by Darío González.
Our interactive and intelligent mobile-enabled digital platform provides agricultural and market services to farmers, transforming the way they operate by providing education and training on emerging issues in agriculture, real time information on weather, market insights, and more. Further our solution brings producers and consumers together on a common platform as well as links farmers locally, regionally, and globally.

The Need

Most of the world’s food is produced by farmers living in poverty and lacking literacy and connection to the rest of the world. Meanwhile 83% of surplus food on farms is never harvested as hunger, food insecurity, and the impact of climate change continue to rise. Farmers do not have independent access and insight into markets due, in part, to a lack of knowledge about how markets work and the changes that rapidly occur. A platform is needed that enables farmers to connect to this world and to have more control over their fate. Such a platform would promote understanding and ways to plan and respond to market changes and thereby ensure sustainable and resilient livelihoods.

The Solution

Our solution is a mobile-enabled platform with user-friendly interfaces such as speech recognition and custom emojis that empowers farmers and transforms the way they operate by providing: education and training on emerging issues in agriculture; real time information on weather, market availability, market prices, transport availability; a direct link between farmers and consumers, and linking farmers locally, regionally and globally.

The platform leverages an intake assessment system that learns about the farmer and consumer, offering critical support to the farmer while connecting them to local and global markets. Further, the core process is Market Intelligence (MI): analysis of trends and events and selection of best options for farmers.

The platform is financially viable through service fees and technically feasible through partners providing services such as electricity supplies and Internet access even in remote communities.

While the solution is globally scalable, we will begin with two locations in two different continents and adopt an iterative model, beginning with the basic prototype and obtaining feedback from farmers, making changes and progressing in complexity as appropriate.

The platform creation process is estimated to take one year, to cover the cycle of most crops from planting to harvesting and selling. Formal monitoring and evaluation will inform the learning process.
The Impact

Bringing producers and consumers together on a common platform allows solutions to scale and form more impactful connections.

Connecting rural communities with global networks will give farmers more control over their work and its results. Digital models and analysis, government regulation, and taxes will change producer and consumer behaviour. This will emphasise crops that are desirable for consumers’ health, farmers’ livelihoods, sustainability and adaptation to climate change. Bringing practitioners together will offer far better opportunities for learning, reducing mistakes, and sharing experiences.

**SHORT TERM IMPACT**

- Farmers have the ability to access climate related information to assist farmers in planning, implemented through partnerships with experts in this field.
- Farmers develop more resilient ways of farming. Implementation of agroforestry, regenerative agriculture and science-backed methods in farming.
- Ability to understand market demand.
- Farmers are able to access certifications (i.e., organic, biodynamic, etc.)
- Farmers access financing at reasonable rates. International cooperation assistance, pre-harvest contracts to support access to credit.

**LONG TERM IMPACT**

- 1. Improve Average agricultural yield.
- 2. Decrease risks related to drastic weather conditions.
  (SDG=No poverty, responsible consumption)
- 1. Reduced use of pesticides
- 2. Decrease risks from extreme weather.
- 3. Develop Carbon Capture solutions
  (SDG=Climate action, Life on land, responsible consumption)
- Farmers use blockchain technology to ensure traceability. Increase focus on high value crops. Added value products such as derivatives, healthy foods etc.
- Farmer’s communicate sustainable practices directly to buyers
  Develop local consumption and raise awareness about locally sourced food/crops.
- Investment at the farm level (machinery, infrastructure etc.),
  (SDG=Innovation and infrastructure, reduced inequality)
Farmers around the world have prospered from inherited, centuries-old knowledge of seasonal weather patterns. This knowledge is made increasingly obsolete by the impacts of climate change. Farmers need evolving guidance on the most suitable crops for their land in the current year, the evolving quality of their soil, the optimum amounts of soil preparation, and fertilisation. This platform will enable access to fine-scale models of these factors so that farming methods remain well-aligned with the evolving environment.
Turning Barriers into Opportunities

**DURING PLANNING PHASE: Winning** the trust of farmers and developing their motivation to try new ideas with respect to their livelihoods and developing acceptable User Interfaces and User Experiences.

**DURING IMPLEMENTATION PHASE: Discovering** how the platform can learn from the initial, basic services to provide the most valuable information to farmers.

**DURING IMPLEMENTATION PHASE: Not understanding** the global and local market behaviors to assess and forecast impacts on how to approach our solutions.

**Systemic Barriers**

**Systemic Change Opportunities**

Engage with community leaders to gain their trust and endorsement of the platform services and to determine the key stakeholders and the most highly valued services. Form teams of farmers and other stakeholders to design and test User Interfaces, User Experiences, and outcomes from the platform services. Connect with relevant partners and stakeholders including farmers, government, civil society, NGOs and other support organisations, consumers (including retail, traders, consumers) in the planning phase to seek their support.

Operate an initial platform, possibly based on human rather than IT systems, to learn the challenges and responses of farmers to everyday operations, whether in dealing with markets or with planting, growing, harvesting, and selling crops, and to train Artificial Intelligence (AI) to learn ways of responding to these, and to incorporate these in the platform services.

Engage agroeconomists, authorities who manage local and national markets/plazas and export authorities to bring market intelligence on market movements on pricing, volumes and volatility.
Navigating Unknowns

Potential Unintended Consequences

It is possible that a large amount of proprietary information could accumulate on the platform that could harm business development as a result of individuals working on research/guidance etc. rather than on their business.

As this is a remote digital platform, there is a chance that generic information could influence poor decision making by business owners.

Having all the information in one space may result in undermining the work of local support entities.

The solution, by introducing modern beliefs and practices, will bring social changes in rural communities that are unwanted by older generations.

Thinking Ahead - strategies to avoid these consequences

A possible solution is creating a series of filtering mechanisms to protect privacy and refine information presented to individuals/businesses based on their particular circumstances.

A system to allow businesses to access more detailed information or consultation from specialists may help reduce the likelihood of tunnel vision.

The solution would be aiming to get as much stakeholder support from government and active organisations (eg. farm input companies, NGO’s, extension offices).

These changes must be introduced with the support of the community leaders and must respect traditions and Indigenous methods.
Similar Solutions in Action

ZAMBIA

Zambia community harvest registers digital marketplace connects 1000 farmers/buyers directly to customers. Their mapping software bridges the last mile so clients can reach the farm gate and farmers cooperate to aggregate production. Cloud based so globally scalable.

For our solution to work, we need to understand how farmers can derive maximum benefit from the increased access to markets, how to gain their support for this approach and to help them understand how markets work.

Partners are needed to offer expertise on: market intelligence, software development, analytics/AI, platform hosting and management, and digital infrastructure.

Our goal is to have a prototype of improved market access operable by the end of twelve months. For year 2, we begin replicating the solution in 10 sites. Subsequently, we will implement a franchise system for scalability.

We anticipate the need for a budget of USD 500,000.
Cohort Participation Countries

POWER
TO THE FARMERS
FOOD WE CAN
TRUST
24: Promoting Food Safety and Traceability

Cohort Team Members: IXON (Felix Cheung, Elton Ho), PureScan AI (Manasa Gonchigar, Nishant Aggarwal), SourceTrace (Anandana Rait, Om Routray), TagTrace (Leonardo Solorzano), MENIS Technologies AG (Franziska Gartenmann, Bettina Zimmermann). This Cohort was guided by Maame Ekua Manful
Reducing foodborne diseases through a food safety and tracing platform. Empowering food producers, customers and other actors all around the world from farm to fork to effectively increase quality and safety, while educating consumers to make more informed food choices.

The Need

The WHO estimates that 600 million people fall ill and 420,000 people die annually as a result of eating contaminated food. Most impacted people are children under 5 years of age from low and middle income countries. The World Bank estimates that the socio-economic costs of food-borne illnesses exceed US$110 billion, while the WHO approximates productivity losses in excess of US$95 billion alone in low and middle income countries. Unlocking solutions to mitigate food-borne illnesses in a sustainable way, could elevate the economic trajectory of low and middle income countries and positively transform realities of many people globally.

To realize this objective, our cohort requires support from partners to address this need by:

- Empowering food producers and manufacturers to better meet food safety requirements
- Improving consumer food-related decisions and handling practices to minimize the exposure to dangerous contaminants
- Investing in an interoperable food safety and traceability platform which ensures access and inclusivity for all stakeholders from farm-to-fork

The Solution

A new era of safe food arrives as a game-changing food safety and traceability platform employing cutting-edge digital and molecular technologies that empower all stakeholders from farm to fork to effectively decrease their respective key factors causing food-borne diseases. It relies on innovative data collection and interpretation to ensure traceability and transparency throughout the food value chain. This allows food producers and smallholders to increase both quality and safety of their products. The data is used to generate an intelligent food product labeling scheme integrating key aspects like maximum residue limits, and other parameters, ultimately allowing consumers to make more informed food choices. Capacity building services complement the solution. The technology is adaptable, accessible, and affordable for low-income countries.

A successful implementation relies on collaboration between the respective government, academic institutions, large food manufacturers and retailers as key partners. As each market is unique due to its geographical, agricultural, regulatory, and cultural setting, a first market ought to be defined and selected for a first pilot. Data on existing food safety practices, specific issues, risks and pain points as well as market dynamics will be collected to design a solution that will address the challenges as effectively as possible.
The Impact

**SHORT-TERM:** We expect both tools and training to empower smallholders in our first market of choice to take back control over their risk management, significantly increasing local food safety and reducing foodborne diseases. Smallholders will be enabled to sustainably improve the technological standard of their food safety management and gain access to new markets.

**MEDIUM-TERM:** We expect to significantly reduce foodborne disease and therefore increase the country’s GDP as well as decrease national healthcare costs, enabling a better quality of life for the general population. With the rise of awareness and sensitization with regards to food safety, industries such as laboratory supplies and services, auditing, and the hygiene solutions market are expected to experience a significant increase in demand.

**LONG-TERM:** We expect our solution to reduce both deaths and burden related to foodborne diseases. Significant productivity increases should be achieved in low- and middle-income countries, leading to better quality of life and additional income available for families. Increased traceability and better food safety practices lead to a reduction of product recalls and thus food waste with reduced greenhouse gas emissions. Increased availability and affordability of safe food reduce food driven migration, while fostering innovation and the creation of new jobs.
Our platform seeks to reduce the foodborne disease burden to the extent that it becomes an issue of the past. Safe food as a basic human right is no longer just an idealistic aspiration, but the feasible and improved reality of people all over the world.

Our platform allows for full ownership over any technological, economic, and cognitive leaps that can be achieved, ensuring a sustainable and lasting impact on global food systems as we know them.
Turning Barriers into Opportunities

**Environment:** A critical barrier for the successful implementation of our solution and the respective impact is the lack of awareness and know-how around safety and hygiene practices. If a problem, issue, or risk is not recognized as such, this significantly decreases the ability to recognize and understand the value-proposition of a presented solution.

**Livelihood:** Another barrier for impact is presented through the economic constraints (resources such as labour or capital) of platform participants such as smallholders, farmers, food producers, and manufacturers preventing them from adapting new solutions.

**Human health:** The most significant barrier for our solution’s impact on human health is the lack of affordable safe food. The availability of safe food does not directly translate into the affordability of such products, which in the end is a more important criteria determining food-related consumer choices.

**Systemic Barriers**

Partnering with influential stakeholders and key opinion leaders such as local governments, auditors, and media maximizes the impact of important messages placed through awareness and educational campaigns, leading to a broader sensitization of the target groups.

Securing the buy-in of both governments and retailers could secure important funding and support allowing for access and inclusivity of smallholders and farmers to the food safety platform while decentralizing any power dynamics within as the data and tools provided remain the same for everyone.

As the food safety platform focuses on the empowerment of smallholders and farmers by offering capacity building services in terms of know-how and technological standard, new markets become accessible at scale which would increase the availability and thus supply of safe food, driving down the price and making safe food more affordable.
Navigating Unknowns

Potential Unintended Consequences

Safer food, more disposable income and increased productivity may not only lead to a higher quality in life but affect the ageing of the population.

Similar to the on-going pandemic, an increase in awareness related to food safety issues can drive up the value associated with "safety and quality". This could potentially put stakeholders with better safety practices at an unfair advantage.

Potential for misuse of the safety labels.

Thinking Ahead - strategies to avoid these consequences

Should the solution have unintended consequences for the demographic distribution of a country, structures and frameworks ought to be put in place to ensure the support and care of the elderly. Once again, partnering with governments and local key decision makers, community based support structures may be put in place.

Partnering with NGOs, governments, and trade associations to drive capacity building programs for smallholders and farmers could give them the necessary tools to compete in the market.

Partnerships with auditing services and governments are critical to avoid any misuse. This also provides an additional opportunity to improve the relationship and trust between the state and the food safety industry, based on the shared mission of protecting consumers and their health.

We envision working with key partners, including:

- **Governments** are critical to spread awareness, place food safety educators in communities, and drive investments in public goods related to food safety. Their financial support for food stakeholders will be necessary to remove economic constraints.
- **Media** cooperation will be important to spread the sense of urgency and awareness related to food safety.
- **NGOs** are an important facilitator in educating relevant stakeholders through a community approach.
- **Charitable or start-up support** to enable availability and access to the necessary technologies will have a great impact.
- **Multinational food producers and retailers** are needed in order to scale the solution to reach maximum impact.
Similar Solutions in Action

1. **Nutritional Food Product Labeling:** A study of consumers in Sri Lanka found that a greater proportion of individuals in the age category of 36 to 50 years, individuals with tertiary education, individuals with special dietary status, and households with less than four members were willing to pay more for nutritional labels. Thus, it could be stated that the incorporation of a nutritional panel in the package would enhance the demand for food products and it would be an appropriate strategic task for the local food processors.

2. **Food traceability systems:** The Feed the Future Partnering for Innovation Project has supported the Haitian information technology company Solutions to develop a tracking software that provides full traceability to smallholder mango growers, enabling exports by ensuring compliance with the U.S. Food Safety Modernization Act.

3. **Capacity building:** The capacity building group of AGNS has conducted a multitude of projects to improve food quality and safety situations in a broad variety of developing countries.
ENABLING A NEW ERA OF SAFE FOOD
Post Program Support

While the design of the Food Systems Game Changers Lab recognizes that the journey of each Solution Cohort will vary as opportunities for partnership emerge, the Lab is poised to offer light touch support to coalitions (i.e., Solution Cohorts paired with Scaling Partners) that commit to advancing prioritized game changing solutions. Thought For Food’s virtual lab platform will serve as a “home” for these new and existing partnerships formed via the matchmaking, offering a space in which to further develop Action Agendas for game-changing ideas and support systems leaders to accelerate their goals.

The below menu of options provides further opportunities available to coalitions from the Solutions Accelerator and the UN Food Systems Summit process.

- Cambridge University and EAT Policy Lab
- World Food Programme Innovation Accelerator
- Transformation Leaders Network
- Thought For Food Digital Platform
Acknowledgments

The 24 Action Agendas presented here were developed by Solution Cohorts of individual “game changers” —representing 412 organizations and 85 countries— who dedicated their time, energy, expertise, and out-of-the-box systems thinking to the Food Systems Game Changers Lab. The transformation of their individual ideas to collective solution sets was shepherded by 12 Thought For Food Guides over the course of a 12-week Accelerator. The specific individuals who crafted each Action Agenda and their TFF Guide are credited on the cover page for each specific Action Agenda.

The Food Systems Game Changers Lab was made possible by The EAT Foundation and The Rockefeller Foundation, in association with Meridian Institute, IDEO, Thought For Food, Forum for the Future, and SecondMuse. This Compendium was produced by Intention 2 Impact, serving as the Monitoring, Evaluation, and Learning (MEL) partner for Food Systems Game Changers Lab and graphic designs for the report were produced by Ayouni.
Annex 1: The Food Systems Game Changers Lab Program Design

**March - May 2021**

**Global Open Call**
Cohorts developed and submitted solutions for a better food future

**June-September 2021**

**Solution Cohorts Participate in Lab**
Cohorts participated in FSGCL to up-skill, network, and co-develop solutions

**September-October 2021**

**Matchmaking**
Solutions are presented at the UN Food Systems Summit
Cohorts pitch to Scaling Partners and participate in Action Agenda Assemblies

**2022 and beyond ...**

**Solution Coalitions**
Cohorts work with Scaling Partners to evolve, pilot, and scale their solutions
At the heart of the Food Systems Game Changers Lab is the formation of Solution Cohorts, and the experiential 12-week learning program designed to support each cohort develop the mindsets, tools, and connections needed to think and act within complex, interrelated food systems. The program offers a unique array of learning resources, Masterclasses, collaboration, and facilitation in the lead up to the UN Food Systems Summit and beyond, enabling cohorts to co-develop Action Agendas for systems change in their respective solution areas.

The Game Changers Lab Solutions Accelerator followed Thought For Food’s (TFF) Learn, Think, Do, Share model with 4+ hours per week of activities designed to propel Solution Cohorts forward toward Action Agendas.

**Lab Model**

**LEARN**
- Develop and deepen skills in key areas related to the Action Agenda through digitally-available Discovery Labs filled with articles, bite-size readings, videos, case studies, and tools to apply.

**DO**
- Build Action Agendas collaboratively:
  - Weekly Reflection Exercises
  - Weekly Guide Check-ins: Solution Cohort Working Session: Working session for Solution Cohorts to progress on the co-developed Action Agenda
  - Prepare a compelling pitch, alongside a presentation, to share the actionable solution sets

**SHARE**
- Weekly reports on outcomes and process

**THINK**
- Access experts and experiences that help cohorts critically engage with and act upon content.
  - This part of the process includes:
    - **Expert Masterclasses:** with thought leaders/experts and practitioners like Otto Scharmer and Sara Farley on Systems Leadership, Cecilia MoSze Tham and Dr. Prabhu Pingali on Unintended Consequences and Atusko Toda and Roderic Norman on Partnerships & Coalition Building
    - **Mentor Matchmaking:** with diverse mentors in key areas
    - **Live Programs:** presentations, webinars, virtual workshops - rolled out by TFF on topics of relevance
    - **Expert Masterclasses:** with thought leaders/experts and practitioners
    - **Mentor Matchmaking:** with diverse mentors in key areas
    - **Live Programs:** presentations, webinars, virtual workshops - rolled out by TFF on topics of relevance

**CONNECT**
- Connect with food systems actors with the potential to scale solutions to launch solutions into action
  - **Feedback Sessions:** Personalized feedback to support the development of compelling pitches
  - **Narrative Workshops:** With food systems storytellers to support the development of a compelling pitch
  - **Scaling Partners Panels:** Series of individual meetings to connect Solution Cohorts to food systems actors that hold the potential to scale up solutions
The FSGCL Process Arc

The Food Systems Game Changers Lab Process Arc, designed by Forum for the Future, was thoughtfully curated to comprise a sequence of activities — from initially describing the system of stakeholders around them, to understanding what processes and mindsets were driving current patterns of events, and how to transform systems to deliver visionary outcomes.

Forum for the Future provided coaching to Thought for Food’s Guides, who facilitated the cohort sessions. In the process, Forum and TFF equipped Guides with systems tools and workshop structure to enable effective facilitation, and supported the Guides when they faced facilitation challenges. Forum and TFF co-designed workbooks and navigation guides, so cohorts could capture their design thinking as they built out their solution.
Annex 2: Individual Submissions to the Food Systems Game Changers Lab (FSGCL)

This compendium showcases the incredible collective solution sets that each cohort has created through the Game Changers Lab Solutions Accelerator. As collective action is paramount to ensuring transformative change, these collective solutions sets will serve as the basis for matching with interested Scaling Partners. To apply for the Lab, however, individuals submitted their individual innovations, ideas, and initiatives through IDEO’s Global Open Call. A catalogue of these original submissions can be found here.

While the focus of the Food Systems Game Changers Lab is on collective solution sets, we hope you find the individual ideas submitted at the start of the program helpful and informative.