

# **‘Ideas Paper’**

## **Action Track 3: Boost Nature-Positive Food Production at Scale**

Draft - 23 February 2020

**The purpose of this paper is to outline the ‘first wave’ of game-changing solutions emerging from the work of Action Track 3 as of 23 February 2021.**



**DISCLAIMER:** This paper presents merely an initial set of ideas submitted to the UN FSS Secretariat by Action Track 3 (i.e., the first ‘wave’ of ideas): additional solutions will continue to be developed over the coming months, in close collaboration with relevant stakeholders. Moreover, the ideas presented here are far from final: they will continue to be developed further and contextualised, again through active stakeholder engagement. Finally, while these ideas are emerging from an interactive and collaborative process, Action Track 3 is a diverse and broad group, containing varied perspectives and opinions: inclusion of a solution here should not be interpreted as an endorsement of that idea on behalf of all Action Track 3 members or their institutions.

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## A. Introduction

### **Goals of Action Track 3**

The food system is vital to the survival of our species. As the global population rapidly increased in the 20th century, agriculture innovations ensured food producers could keep pace. The food system is the biggest employer in the world - with over 1 billion people working in food - and farming creates opportunities to lift people out of poverty in the developing world.

Biodiversity and well-functioning ecosystems underpin sustainable food production and our ability to deliver on the Sustainable Development Goals, as well as the biodiversity and climate targets laid down in the Convention on Biological Diversity and the Paris Agreement respectively. Given the urgency and scale of change needed, a shift in food production must aim to enhance natural capital and its delivery of ecosystems services that support humanity.

The goal of Action Track 3 is therefore **to boost nature-positive production systems at scale to globally meet the fundamental human right to healthy and nutritious food, while operating within planetary boundaries.**

As the basis of our food production, the health and productivity of our land and water resources are critical for our future sustainability. But food production systems are currently the single biggest underlying cause of decline in nature, responsible for approximately 80% of deforestation, 70% of freshwater withdrawal, and up to 29% of all greenhouse gas emissions -- while livestock contributes over 14% of all anthropogenic GHG emissions, 44% of which is in the form of methane. Drivers linked to agriculture cause 70 per cent of terrestrial biodiversity loss and 50% of freshwater biodiversity loss. Direct exploitation (mainly fishing) for food, is the primary driver of the decline in health of the oceans. With aquaculture using 20% of all wild fish caught for feed, we are destabilizing the recovery potential for fish stocks. Croplands and grazing lands now cover more than one third of the Earth's land surface, with recent clearance of native habitats, including forests, being concentrated in some of the most species-rich ecosystems on the planet.

### **Nature-positive production**

We understand nature-positive production as ***a form of food production that is characterized by regenerative practices that manage soil and water and enhance biodiversity. It is the non-destructive use of natural resources that protects and builds upon natural and social capital.*** It recognises that biodiversity underpins the delivery of all ecosystem services on which humanity depends— such as regulating water and climate, supporting nutrient cycling and soil formation, and provisioning food and other raw materials.

### **Game changing solutions**

The preparation of the UN Food Systems Summit 2021 is taking place through a broad, inclusive process, bringing together the best of the science community in their field, practitioners (both global and country), decision makers, actors and stakeholders of food systems.

Global, regional and national actors are coming together through complementary UNFSS processes and working in close synergy to identify, select and develop collective, game-changing and systemic solutions<sup>1</sup>.



- At global level, discussions and reflections on thematic and cross-sectoral bottlenecks, and associated game-changing solutions are advanced thanks to synergies between several entities: the **Advisory Committee**; the **Scientific Group**; and a range of countries and multistakeholders gathered in **5 Action Tracks** and **4 Levers of Change** groups, as well as in a UN taskforce, Private Sector and Civil Society Groups, and a network of champions including Youth. Solutions are emerging through thematic scientific papers, several rounds of public forums and open-online surveys, stakeholder consultations as well as discussions through the [online Community Platform](#).
- Numerous **Food Systems Summit dialogues** are expected to take place in the first half of 2021, to complement this work. Member States FSS dialogues will gather national multistakeholders around governments to identify or test context-specific solutions, to be channelled to Summit preparation processes. These dialogues are complemented by a range of global, regional and independent dialogues.

This document reflects ‘first wave’ of game-changing solutions emerging from the work of Action Track 3 as of 23 February 2021



## B. Action Track 3 process to generate game changing solutions

### ***Process for generating solutions***

The 24 ‘first wave’ of solutions in this document have been generated by the ‘Areas of Collective Action and Innovation’ for Action Track 3. ACAIs are multi-stakeholder platforms composed by members of AT3 Leadership Team, tasked with analyzing challenges as well as designing, identifying and assessing new and existing game-changing solutions to deliver the outcomes of Action Track 3.

The ACAIs for AT3 reflect three necessary conditions to boost nature-positive production at scale:

1. **Protect** natural ecosystems against new conversions for food and feed production.
2. **Manage** existing food production systems sustainably, to the benefit of both nature and people.
3. **Restore** and rehabilitate degraded ecosystems and soil function for sustainable food production.

In this process, the Advisory Team for each ACAI were asked to do two things:

- A. **Assess** game-changing solutions received from the public survey and other sources and cluster them around common objectives
- B. **Develop and present** solutions for this submission, identifying leads and sub-working groups for each solution

This document reflects the outcome of this work and is a point in time snapshot of the solutions generated by the Advisory Teams of Action Track 3 for the ‘first wave’ of game-changing solution development. While the development of the ‘first wave’ of solutions has been underway, many additional inputs have been received through the public survey and as submissions through the UN agencies, Member States, the private sector.

Action Track 3 is now in the process of assessing the “second wave” of solutions and will input them into the existing set of solutions, assessing and bridging gaps as the process continues.

An initial effort to map the input already received from Member States, UN agencies and the private sector against the solutions outlined in this paper is included as an Appendix. We will refine this initial effort in conjunction with the stakeholders who have suggested solutions as well as continuing to review further input as it received.

### ***Definition and criteria used***

“A ‘game changing and systemic solution’ is a **feasible** action, existing or new, **based on evidence, best practice, or a thorough conceptual framework** that would **shift operational models or underlying rules, incentives, and structures** that shape food systems, acting **on multiple parts of – or across – the food system**, to advance global goals which can be sustained over time.”

### **What are the key criteria for a game changing, systemic solution?**

- (1) impact potential at scale (incl. return on investment)
- (2) actionability (politics, capacity, costs)
- (3) sustainability (the ability to keep delivering to 2030 and beyond)



**“Principles” for systemic solutions:**

- Have positive effects on ensuring equitable livelihood opportunities, advancing human health, and regenerating environmental integrity, with focus on youth, women, marginalized and disabled populations
- Be a true departure from existing practices that address a long-term constraint, obstacle or trend
- Be ambitious and think big with concrete pathways and actions for long term systemic change
- Have deliberate impact pathways that account for/minimize/eliminate negative impacts, have co-benefits, or are mutually reinforcing on achieving the other Action Tracks’ goals
- Be implementable at a sufficient scale to reach a large portion of the population with clear, timely and verifiable outcomes that produce significant impacts by 2030
- Be sustainable, in that it can persist in the medium- to long-term future
- Anticipate and prevent future lock-in’s
- Promote gender equality and women’s empowerment in food consumption and production systems



## C. Summary of game-changing solutions

### ACAI Protect

**Objective: Protect natural ecosystems against new conversions for food and feed production**

Problem to be resolved	Solution proposed
In many countries, the public support being provided by governments to the agricultural sector through subsidies, pricing and other fiscal measures has unintended consequences and is not aligned with a country's food and nutrition security, climate and biodiversity goals.	<b>1. A just transition to sustainable agriculture through policy reform and public support</b> Redirect support (incl. subsidies) to incentivise a just transition to sustainable agriculture, addressing food and nutrition security as well the climate and nature emergencies.
Pressure for agricultural expansion, economic development, and trade have and will continue to increase deforestation and natural habitat conversion if not comprehensively addressed.	<b>2. Transforming commodity supply chains to benefit people and to protect and restore nature</b> Bring together participants from all parts of the global commodity supply chain, balancing voices from consumer and producer countries, and seeking to build a partnership of mutual respect, collaboration and trust through the FACT Multi-Stakeholder Dialogue.
Although a major share of the world's forests are found in Indigenous Peoples' lands, they are increasingly threatened by encroachment, fires and drought driven by food production as well as the erosion of cultural norms and traditional knowledge.	<b>3. Strengthening Indigenous and Tribal Peoples' rights to management of their territories</b> Strengthen the Indigenous and Tribal Peoples' capacity to manage and protect their forests through greater recognition of rights over their lands, policies and support, payment for environmental services, strengthening traditional knowledge and fostering new indigenous and tribal organizations, with strong participation of women and youth.
There is no standardized environmental guidance for global food trade like there is one for food safety (i.e., <i>Codex Alimentarius</i> ). The lack of such guidance makes it difficult for countries to make trade decisions on environmental grounds.	<b>4. Develop a "Codex Planetarius" to determine a set of minimum environmental standards to govern global food trade</b> Develop a "Codex Planetarius", i.e., a globally recognised standards framework for the environment, requiring minimum performance levels for products to enter the global market. This would allow countries to reach agreement on a baseline set of criteria on sustainable production, across a range of factors such as biodiversity, soil health, water and air quality and agrochemical toxicity.
There is insufficient focus on protecting and restoring riparian vegetation within private agricultural lands which often function as corridors that allow species and gene flow, conserve freshwater species and have a well-recognised role in carbon storage and sequestration.	<b>5. Global movement to protect and restore riparian buffers in private agricultural lands</b> Protect and restore native vegetation within private agricultural lands that acts as buffers to rivers, streams, wetlands, springs, etc. to reduce soil erosion and to protect both the quantity and quality of water sources where compromised by agricultural practices.



## ACAI Manage

**Objective: Sustainably manage existing food production systems to the benefit of both nature and people**

Problem to be resolved	Solution proposed
Business as usual in agricultural innovation will not catalyze the transformation in food systems that is needed for nature-positive production at scale.	<b>6. Transforming agricultural innovation for climate, nature and people</b> Shift the dial on agricultural innovation, with greater investment into innovation, efforts to address fragmentation among institutions, and to scale and evidence-based dialogue.
The livestock sector is often seen as responsible for biodiversity degradation, excessive water use, desertification and greenhouse gases emissions.	<b>7. Adopting nature-positive livestock production systems</b> What is less known is that livestock also holds a great potential in fostering soils health, soil fertility, increased carbon sequestration and biodiversity services, reducing diseases of animal origin and reducing antimicrobial resistance. This solution unlocks the potential of sustainable livestock farming through fostering innovative methods and ensuring economic viability for all categories of farmers.
There is a pressing need to scale-up nature-positive food production practices at pace to both address the current negative effects of food systems on climate, biodiversity and agrobiodiversity at the same time as meeting the needs of a growing population.	<b>8. Adopting regenerative agricultural practices for resilient landscapes at scale</b> Adopt regenerative agriculture at scale, a system of farming, grazing and fisheries management principles and practices that seek to rehabilitate and maintain the functions of terrestrial and aquatic agroecosystems that guarantee the preservation of the foundation of sustainable food production: soils, biodiversity, water, nutrient cycling.
	<b>9. Scaling-out Agroecological Production Systems</b> Scale-out agroecological production systems, systemically considering different elements of food systems from production to consumption and involving all stakeholders (women, men, youth, marginalized and indigenous communities) and sectors.
The global food system has lost significant functional agrobiodiversity, just 9 agricultural crops supplying nutrients for 66% of global food production, with significant impact on the resilience of production systems, in terms of food and nutrition security, the quality of the environment in terms of land degradation and provision of ecosystem services.	<b>10. Increasing agrobiodiversity for improved production and resilience</b> Increase agrobiodiversity through addressing 4 dimensions of the problem: (i) the knowledge gap, (ii) the incentives for use agrobiodiversity in production systems, (iii) the policy necessary to enable more diverse systems and (iv) the required financial investment and incentives mechanisms.



<p>Blue foods provide a significant and difficult to replace contribution to nutrition and food security, yet are generally seen as a 'natural resource' with emphasis placed on policies that maximize economic rents and production. These valuable resources and the environments they depend on are at risk due to threats from climate change, unsustainable aquaculture growth and overfishing.</p>	<p><b>11. Sustain and Expand Sustainable Resilient Blue Food Production Systems</b> Employ newly created analytical tools for national governments to more accurately assess the nutritional and socio-cultural assets and utilities of blue foods resulting in more pro-active usage policies and a greater allocation of resources in support of blue food systems with a smaller environmental footprint.</p>
<p>Most policies that influence food systems are based on an outdated paradigm focusing on maximizing single crop yields and cheap calories, at the cost of many unwanted social, health and environmental outcomes. Such policies perpetuate unsustainable systems by rewarding investments and business models that do not account for the true cost of food and overlook the benefits of nature positive practices.</p>	<p><b>12. Aligning policies with nature-positive production</b> Mainstream nature-positive production calls to align agricultural and other relevant policies to reflect the true cost of food and set incentives for nature-positive production practices, constraints and disincentives for nature-negative production practices at the regional, national and sub-national levels.</p>
<p>Reducing food loss is essential for reducing climate impact of food supply, impacts of land use changes, and realizing food and nutrition security, particularly in high-emission supply chains such as beef, dairy, and rice.</p>	<p><b>13. Reducing on-farm and post-harvest food loss</b> Reduce of on-farm and post-harvest losses for critical global commodities (both perishable and non-perishable).</p>
<p>The relatively narrow genetic base underpinning many of today's agri-food systems makes them vulnerable to climate change and limits dietary choices and livelihood opportunities of stakeholders.</p>	<p><b>14. Broadening the genetic base of nature-positive production systems</b> Deploy at scale the resources of gene banks around the world to broaden the genetic base of agri-food systems, addressing current challenges on information gaps, focus of programmes and two-way communication</p>
<p>Governments, food and agriculture companies, and public and private investors need to better identify and address the numerous climate and nature-related risks they face presenting an opportunity to provide investment opportunities that drive transformation to nature-positive, low-carbon and climate resilient food systems.</p>	<p><b>15. \$200M Climate Smart Food Systems Impact Investment Fund</b> Launch a USD 200 million impact investment fund provide long-term expansion debt financing to SMEs operating in Asia Pacific, Latin America and Africa to support climate-smart interventions</p>



## ACAI Restore

**Objective: Restore degraded ecosystems and rehabilitate soil function for sustainable food production**

Problem to be resolved	Solution proposed
Aquatic or blue foods have the potential to deliver future sustainable food systems, but growth must avoid the mistakes of land-based food production, over-intensification, inequities throughout the value chain, and a focus on mono-cultures.	<b>16. Addressing ‘invisible’ underwater issues for food systems: The “blue food” revolution</b> Incorporate blue foods into broader food-systems policy beyond production to consider efficiencies, equity, affordability, and consumption, and embed under-represented groups in decision-making.
The global food system faces an interconnected triple challenge of unhealthy diets, caused by both over- and under-nutrition, paired with losses of biodiversity and climate change.	<b>17. Delivering healthier diets and restoring land through tree-based food production</b> Incorporate food trees with complementary crops into degraded landscapes to produce more nutrient-rich foods, restore degraded soils, and contribute to climate change mitigation.
Grasslands, shrublands and savannahs cover extensive parts of the world and often contain significant biodiversity, however there is a lack of appreciation of their value. At the same time, there is a lack of appreciation of extensive livestock-based livelihood and food systems and their potential to provide environmental services such as maintaining or improving biodiversity, carbon storage and sequestration, and preventing duststorms are also often not recognised.	<b>18. Restoring grasslands, shrublands and savannahs through extensive livestock-based food systems</b> Restore grasslands, shrublands and savannahs through extensive livestock-based food systems, including bringing together a multistakeholder platform, developing global data platform, documenting good practice, raising awareness, and improving investments
Despite steady momentum and commitments by national governments towards forest restoration, tangible results have been lacking, and their remains a gap in reporting of concrete economic, ecological and social impacts.	<b>19. Enhanced restoration monitoring and data to guide investment</b> Develop an enhanced systematic monitoring system to track progress of restoration actions and outcomes to help cultivate the badly needed business case to spur increased investments.
The deeper systems understanding of, for example, how soil health, functioning water cycles, and biological diversity underpin sustainable value chains, nutrition quality, market access and diversified livelihoods remains inadequate contributing to siloed approaches and ineffective collaboration.	<b>20. Shifting the way stakeholders engage with evidence to enhance food system decision making</b> Develop a structured stakeholder engagement process that fosters interaction between people and multi-thematic evidence to cultivate an understanding of systems, greater inter-sectoral and multi-stakeholder collaboration and decisions and direct actions that overcome siloed and ad hoc approaches and integrate economic, social and ecological dimensions.
Current top-down policy, program and finance decision-making, undermine local visions and coordinated action for thriving landscapes. Stronger landscape-scale local governance and coordination are needed to link territorial development to local needs and human rights.	<b>21. Strengthening Landscape Partnerships</b> Launch a global collaborative initiative to strengthen, and help form, new Landscape Partnerships (LPs) that are enabled and empowered to lead coordinated transformation of their local food systems



The soil's stewards, farmers and ranchers, face critical economic barriers to scale the adoption of healthy soil practices and there is a lack of a standardized investment assessment framework for soil health to align promising financial mechanisms to support them to adopt healthy soil practices.

Agricultural soils have a large potential to sequester carbon (organic and inorganic), contributing to climate change mitigation, adaptation, resilience, as well as improved livelihoods.

Indigenous peoples' food systems are under increasing pressure with significant negative consequences for traditional management systems, sharing of indigenous peoples' knowledge, and the sharing of benefits that come from conservation and management of key ecosystems.

## **22. Soils Investment Hub**

Create a critical mass of food and agriculture value chain companies and key stakeholders that drive alignment of investment decisions, mechanisms and capital towards scaling healthy soil agriculture practices.

## **23. Building global initiative to address soil health and carbon sequestration**

Manage soil health sustainably through sequestration and build up of soil organic carbon content through adoption of regenerative agriculture and rewarding farmers and land managers by payments for ecosystem services, carbon farming and trading carbon credits.

## **24. Indigenous peoples' food systems: conservation and biocentric restoration**

Promote an inclusive model of conservation led by indigenous peoples based on their knowledge and food systems and applying an adequate blending of new technologies with ancestral knowledge.



### ***Areas for further development***

This document reflects the ‘first wave’ of the solutions generated by the Advisory Teams of Action Track 3. As the process of solution generation and refinement are ongoing, there are several areas we wanted to highlight for further development within Action Track 3:

- Role of education and training solutions to enable transitions to nature-positive production
- Sustainable intensification to reduce emissions and negative environmental impacts per unit of production and to reduce the economic incentive for further deforestation, ground water exhaustion, biodiversity loss, desertification etc.
- Further consideration of the financial mechanism needed to enable a shift to nature positive production systems e.g. impact finance, risk mitigation, true cost pricing
- Further incorporation of gender-specific solutions, e.g.
  - Access to land: Women must have unfiltered ownership of land, and the legislative, policies and socio norms must give way for that
  - Gender analysis: Agric ecological models are knowledge intensive, we must have a knowledge system that also ropes in indigenous knowledge and ICTs
  - Access to communication tools: As we address nature positive production systems in the long run, we must pay for the legacy of discrimination that leads to vulnerabilities for women



## D. Solutions from ACAI Protect

### 1. A Just Transition to Sustainable Agriculture through Policy Reform and Public Support – Meeting the triple challenge of food and nutrition security, climate and biodiversity

#### 1. Background information

Providing nutritious, affordable food for a growing global population while protecting the vital natural systems that sustain life is one of the critical challenges of the coming decade. In recent decades, agricultural policies, subsidies and price supports have largely been directed at increasing yields and expanding production, particularly of staple crops. By some measures this was successful – while the global population doubled, food production almost quadrupled. However, the impact of climate shocks and nature loss is increasingly threatening food production and while food has become more affordable for many consumers, hunger is once again on the rise.

According to the Food and Agriculture Organization, in 2019 nearly 690 million people were chronically food insecure and 2 billion people did not have regular access to safe, nutritious and sufficient food. The UN predicts that COVID19 could result in an additional 265 million people suffering from acute hunger. In addition to these direct and very visible costs, there are also substantial and growing hidden costs due to the unintended consequences of current agricultural policies and public support on natural ecosystems, climate change and public health.

Agricultural subsidies, price supports and policies can provide incentives to strengthen food and nutrition security and to address climate and nature emergencies. Unfortunately, for the most part, current public support to the sector does not provide positive incentives for these broader outcomes. Those systems focussed on increasing yield alone using high input models can make meeting broader climate, environment and sustainable development objectives more challenging. It is vital that changes.

According to the Organization for Economic Co-operation and Development (OECD), between 2017 and 2019, the 54 countries that produce two-thirds of the world's food provided on average US\$619 billion per year in net transfers to the agricultural sectors through direct subsidies, price supports and other policy measures. Of that total, more than 70 percent is direct subsidies for producers and production; only 17 percent is directed to public services like research, environment or food safety. Other countries, many in the developing world, often underinvest or even tax their agricultural sectors, which also drives inefficient and harmful outcomes.

The food and agriculture sector has strong potential to play a positive role in mitigating climate change, reducing environmental degradation and improving nutrition. There is, therefore, a huge opportunity to repurpose and redesign current support to the sector to incentivise and empower food producers as positive agents of change. For countries underinvesting in their agricultural sectors, there are opportunities to mobilise and target public support towards better outcomes.

A number of governments have started to design and implement agricultural policy reform to better direct public support towards improved soil and water quality, climate mitigation, and biodiversity protection. Many



more governments are interested to learn more, but need technical support to scope options, design and implement new approaches, such as payment for ecosystem services, payment for soil carbon, conservation reserves, etc. Inclusive and integrated approaches are more likely to be successful and elicit political buy-in, therefore inclusive consultation processes play a key role. As part of the COP26 Nature Campaign focus on *Sustainable Agriculture and Just Rural Transition*, the UK Government, in partnership with the World Bank, plans to invite governments to participate in policy dialogues in 2021 to share experience, identify opportunities and build support to move forward on repurposing policies and public support. Consultations with international organizations, food producers, SMEs, investors, civil society and other stakeholders are also planned. An *integrated* COP26 and Food Systems Summit game-changer initiative provides a significant opportunity to build momentum in 2021 and beyond.

## 2. Summary of each proposed solution

### 2.1 What, in brief, is the solution?

This game changing initiative aims to develop a shared narrative and to build momentum around efforts to ensure public support – including a significant proportion of over \$600bn per annum identified by the OECD – incentivises a just transition to sustainable agriculture, addressing food and nutrition security as well the climate and nature emergencies.

Through this work we will develop a shared vision and narrative at global and national levels and provide opportunities to showcase local community and farmer-driven solutions. We will make the case for change to address the opportunities and trade-offs, highlight existing evidence, case studies, best practice and key stakeholder perspectives. Working with interested countries, and in partnership with the COP26 Presidency, multilateral institutions (e.g., World Bank, OECD, FAO, UNEP) and the World Farmers Organisation, we will create a platform for policy dialogue and peer-to-peer learning, providing participants with access to existing knowledge and evidence as well as consultations with key stakeholders.

We will also leverage these efforts to mobilise resources (technical, financial and institutional) to support governments to identify opportunities and politically feasible options for repurposing their agricultural policies and support to help countries meet their Paris and Sustainable Development Goals; and to enable food producers, local communities, civil society and other stakeholders to contribute meaningfully to the reform process. This includes increasing investment in research, analysis and modelling to understand the role of positive incentives in different regional, national and local contexts.

Past efforts to reform public support for agriculture have been hampered by siloed approaches, lack of consensus, political will, and evidence-based understanding regarding the costs of current approaches and opportunities for reform. As the evidence grows and food producers gain experience in adapting and responding to the growing risks from unsustainable production and climate impacts, there is a huge opportunity to build consensus and shared vision through inclusive, integrated policy reform and repurposed public support and investments to accelerate action for sustainable development.

This game-changing solution acknowledges and addresses these issues and aims to mobilise the political will and financial/institutional resources to support a long-term transformative process beyond the Food Systems Summit. Based on the results of well-informed dialogues, national and regional adaptive approaches will be



implemented, new ways of designing agri-food policies will be tested and shared and progress will be communicated annually. A time-bound plan will be developed through to 2025 and linkages to key institutions and processes, including UNFCCC's nationally-determined contributions, the post-2020 Global Biodiversity Framework and the Leaders' Pledge for Nature.

## 2.2 What was/were the source(s) from which this solution emerged?

The Just Rural Transition initiative launched at the U.N. Climate Action Summit in September 2019 with support from the UK Government and its co-leadership of the Resilience Action Track. A number of governments (and many other stakeholders) endorsed the JRT's Vision Statement and signalled their interest in the JRT's Policy Action Coalition, focused on supporting governments move forward with repurposing agricultural policies and public support. The UK COP26 Presidency is building on this initiative as part of its Nature Campaign's focus on *Sustainable Agriculture and the Just Rural Transition*. The World Bank, the OECD, FAO, UN Environment, IFPRI, the CGIAR, inter alia are all developing research and programmes that, collectively, have potential to significantly scale support to governments to move forward. For instance, a joint UNEP-UNDP-FAO report on the *Impacts of Agricultural Support and Opportunities for Sustainable Food Systems Transitions* is being prepared, which is expected to be launched in Q2/Q3 2021. The first phase report on "*Modeling the Impacts of Agricultural Support Policies on Emissions from Agriculture*" has been published.<sup>2</sup> The final report is expected to be launched in May 2021. Working with these and other organizations, the Just Rural Transition in collaboration with its knowledge partners will be developing policy briefs and case studies designed to support governments make evidence and science-based policy decisions.

The campaign around the report will add to various communications initiatives and efforts in the lead up to the Food Systems Summit, and will specifically target policy makers, the agricultural and food sectors and the climate-action-supporting public.

Governments, for their part, are taking a lead in policy reform. At the 2021 Global Forum for Food and Agriculture, ministers of agriculture representing 76 countries indicated their commitment "to reform domestic policies on agriculture, to promote and steer investment towards sustainable agricultural practices that support climate-change adaptation and mitigation."

## 2.3 What problem is it trying to address within food systems?

According to the World Bank analysis, only 5% of current direct public support for agriculture explicitly targets conservation and other public goods and only 6% supports research, extension and technical assistance. In many countries, the public support being provided by governments to the agricultural sector through subsidies, pricing and other fiscal measures has unintended consequences and is not aligned with a country's food and nutrition security, climate and biodiversity goals. Better targeting of incentives provided through public support can help meet current challenges and future-proof food systems, recognising and empowering food producers to be positive agents of change.

## 2.4 Why is addressing that problem important for achieving the goal of your ACAI?

<sup>2</sup> <https://openknowledge.worldbank.org/handle/10986/34453>



Agriculture is currently the second largest source of greenhouse gas (GHG) emissions (after energy) and is responsible for 80% of biodiversity loss, 73% of deforestation, 70% of freshwater use and 78% of water pollution due to global eutrophication. Natural resources are being wasted (while contributing to GHG emissions) if one considers that around 14% of food produced is lost from the post-harvest stage up to, but excluding, the retail stage. Protecting natural ecosystems from further degradation associated with agriculture and land use change requires the right policy settings, including better targeting of public support to incentivise and empower food producers in a transition to sustainable agriculture with synergies for food security and nutrition objectives – the essence of SDG 2. Moreover and most importantly, many other solutions (such as new production practices, new business opportunities or small scale investments in regenerative agriculture) will find it difficult to be sustainable if the enabling policy environment is not supportive.

## 2.5 How can this solution address that problem?

The intended impact of this game-changer initiative is that governments are directing public support to enable a just transition to sustainable agriculture that meets climate, biodiversity, food and nutrition security goals, enhancing rural livelihoods and strengthening resilience of food systems and rural communities.

*If we i) raise awareness by developing and communicating the evidence base for action, ii) drive engagement through peer-to-peer learning and inclusive consultations, and iii) mobilise the requisite technical assistance, resources, political and institutional support, then momentum will build for countries to move forward and repurpose and redesign public support systems.*

Our key assumptions are i) that governments will move forward with policy reform if there is a clear evidence base that win-win solutions outweigh trade-offs and they can learn from one another; ii) that donors, knowledge and implementation partners are willing to scale resources; and iii) that political economy challenges can be feasibly addressed and food producers (farmer organisations etc) will be part of policy dialogue to build trust and buy-in.

Unintended consequences can occur if food producers (farmers, pastoralists, ranchers, fishermen/women, etc.) perceive that they will lose vital financial support and/or not be adequately supported as part of a just transition and if they feel excluded from the process to develop solutions. Farmer protests in India and Europe demonstrate the risks here. Communications needs careful handling to emphasise the tangible benefits for farmer and rural communities of such reform, and that this campaign is not directed at eliminating subsidies (as is the case with fossil fuels) but repurposing support to incentivise a shift to sustainable agriculture and deliver other public goods.

### Key outputs across 2021 include:

- Development of an initial evidence review/synthesis report and additional reports and policy briefs through the year that highlight the costs/benefits and trade offs;
- Convening of senior officials and Ministerial-level policy dialogue (April and Sept);
- Convening of regional consultations and synthesis of key take-aways from these;
- A summary statement from the Sept Ministerial Dialogue including shared conclusions, participant commitments/statements, mobilization of resources and institutional support;



- Further mobilisation of development assistance ahead of COP26 to support Global South governments, food producers and local communities take forward policy reform;
- Analysis and assessment of existing approaches to derive successful mechanisms and identify obstacles to change.

**A longer-term work programme could include**

- Pilots and implementation at national and regional level;
- Integration into NDC revision process;
- Monitoring and evaluation (also in relation to new Kunming targets);
- Annual policy dialogues and communication of progress.

**Outcomes**

- 10-15 governments from different regions actively participating in policy dialogue with an outcome statement that reflects shared vision and incorporates participating countries' commitments as well those of other stakeholders (e.g., World Bank, OECD, FAO, WFO);
- A significant percentage of existing public support is better directed to public goods;
- Increased, targeted and better aligned resources from donors, multilateral development banks, research and implementation partners to support countries move forward with inclusive, integrated reform processes;
- Modalities in place to drive progress beyond the UN FSS involving key institutions, processes and key stakeholders (governments, farmer organisations, civil society, etc.).

**Impacts**

- Food and agricultural policies are playing a positive and supportive role in delivering food systems that achieve societal goals;
- Food systems are supporting food and nutrition security, climate and biodiversity goals;
- Food producers benefit from support for climate mitigation and other ecosystem services;
- Food producers' risks are mitigated and their incomes are more resilient because of a new paradigm of support that relies less on production levels and yields and more on their contribution to ecosystem services;
- Food producers feel they are part of the solution, rather than part of the problem.

**Risks**

- Reform of public support for agriculture is highly context specific, will be challenging to identify and address complex political economy issues through a global effort;
- Negative reaction and protests from farmers, ranchers and other food producers who fear repurposing agricultural policies and public support will negatively impact their livelihood;
- Potential impact of fake news and manipulation of data which thwarts efforts to design evidence-based policy responses;



- On-going Covid-19 pandemic and economic/social impact limits political bandwidth and fiscal resources available for political reform and increased public support for agriculture;
- Repurposing agenda not sufficiently linked to other relevant Action Tracks and initiatives, dilutes message and impact.

## 2.6 Why does this solution align to the definition and criteria for a ‘game changing solution’ developed by the Summit?

**Impact-at-Scale Potential:** From 2017-2019 net public support to agriculture exceeded US\$600B annually, though only a fraction is aligned with climate, biodiversity and food/nutrition security goals.

**Actionability:** The UK COP26 Presidency, the World Bank, the World Farmers Organization, OECD, FAO, WWF, UN Environment and the Just Rural Transition initiative are already mobilised and coordinating support to take forward this work and draw in others.

**Sustainability:** Longer-term support structures will be scoped and developed as part of this initiative.

**Anticipate and prevent future obstacles and barriers:** Policy reforms will help realise ‘OneHealth’ for farming systems, such that the risk of zoonotic spillovers arising from agricultural extensification are greatly decreased.

**Gender Equality and Women’s Empowerment:** Consultations will prioritise the participation and input of women, and evidence-related outputs will place a special focus on policy reforms that build economic opportunity for women.

## 2.7 What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?

In the mid-1980s, **New Zealand** eliminated agricultural subsidies, which helped diversify the country’s exports, decreased erosion, and increased water quality. **Costa Rica** has advanced payment for ecosystem services systems, and reinvesting \$500 million in gasoline taxes for forest protection and restoration. In 2017, **China** eliminated production subsidies for fertilizer that result in excessive nitrogen runoff and GHG emissions. The **UK** is moving forward with a new public support system aligned with delivery of public goods. Other countries have followed suit.

## 2.8 What is the current and/or likely political support for this idea?

A wide range of country governments and institutions have endorsed the Just Rural Transition and its emphasis on policy action and repurposing public support. Countries include Colombia, Ethiopia, Netherlands, Ghana, Switzerland, Togo, UK, and Zambia, as well as Nigeria’s Edo State government. The World Bank has had strong interest for its new technical assistance programme, with ongoing engagement and upstream technical support in 10 countries (Vietnam, Mongolia, China, Indonesia, India, Uzbekistan, Morocco, Ethiopia, Malawi, Zimbabwe, and Argentina) and plans to scale up in another 10 countries in the coming year. The FAO through its Monitoring and Analyzing Food and Agricultural Policies Programme (MAFAP) has, since 2011, worked with 12 sub-Saharan African governments, triggering 21 policy reforms. There is a strong interest from the AT3 supportive member states on this topic.



## **2.9 Are there certain contexts for which this solution is particularly well suited, or, conversely, contexts for which it is not well-suited at all?**

All countries can benefit from better targeting of public support to enable a just transition to sustainable agriculture, but the solution mix will vary by country context. The US\$600bn per annum of current public support is mainly from the OECD countries and 10 emerging economies. Some countries are currently under-investing or not prioritising the right investments in agriculture, and others, particularly in Africa, continue to tax their farmers through policies that tend to depress producer prices, even as they provide input support (often in the form of subsidies), making it difficult for farmers to adopt new technologies or invest and reorient their production patterns to become more sustainable.

These countries may want to review their policies to provide greater support for their food and agricultural sectors, while exploring how to deploy public finance effectively and policy reform (including that which mobilises private investment and public-private partnerships) to incentivise farmers in sustainable ways. In many parts of the Global South input subsidies (such as for fertilisers) are the principal form of public support. These subsidies can have strong adverse effects on water and soil quality, without providing real, sustainable support for farm incomes. In the global North public support is predominantly through market price supports (e.g., tariffs) and production payments. The wide variety of support mechanisms necessitates an accordingly varied array of repurposing strategies, stakeholders, and technical inputs.

## **2.10 Who are the key stakeholders to be further involved in the process of developing and refining the solution idea?**

Current working group includes: UK COP26 Presidency, World Bank, OECD, FAO, UN Environment, IFPRI, WFO, WWF International, JRT Secretariat. Key stakeholders to be consulted include governments, farmer organisations, civil society, multilateral institutions/processes including WTO. CCAFS to provide link to the innovation component of the COP26 Nature campaign (focussed on scaling demand-driven R&D)

## **Any other remarks or comments you would like reflected in AT3's report out on 'game changing' solutions (optional)**

This game-changing solution has a direct relevance for other ATs as well as the finance lever, and alignment across these tracks is important.



## 2. Transforming commodity supply chains to benefit people and to protect and restore nature

### Background information on group and process

- Globally, the **vast majority (approximately 77%<sup>3</sup>) of deforestation and natural habitat conversion is linked to agricultural expansion, either through large-scale commodity production, or as a result of shifting agriculture.** The continuing expansion of production of agricultural commodities such as beef, soy, cocoa, palm oil and paper/pulp are **major drivers of natural ecosystem<sup>4</sup> loss.** This loss of natural ecosystems or habitat contributes **significantly to global biodiversity loss and CO2 emissions,** while sustainably managed natural ecosystems provide substantial and cost-effective carbon emission mitigation, while also generating broader environmental, social and economic benefits.
- There can be no nature-positive agriculture, no long-term resilience to the global food system, no sustained alleviation of rural poverty, and no guaranteed protection for indigenous peoples, if agriculture and the **trade in global commodities continues to drive further deforestation and habitat conversion,** both in the tropics as well as in all other latitudes.
- Instead, the production and trade of global commodities needs to be **tied explicitly to a scaled-up global effort to protect and restore natural ecosystems,** with producer countries committed to sustainable production appropriately rewarded by consumer countries and global markets for these efforts. A global partnership of equals is needed to this end.
- **The UK government – in its role as President of COP26 – has made reducing tropical deforestation linked to the global commodity trade an explicit focus of its Nature campaign, with the launch in early 2021 of the Forests, Agriculture, Commodity Trade (FACT) Dialogue now involving over 25 countries,** including Brazil, China, the EU, the US, Malaysia, Indonesia, Colombia, Ghana, India, Cote d'Ivoire, Peru, Myanmar, and Argentina.
- **The government-to-government FACT Dialogue is supported by an accompanying Multi-Stakeholder Dialogue, led by the Tropical Forest Alliance, intended to ensure the involvement of a much broader set of actors in support of the goals of the FACT Dialogue: supply chain companies, finance sector, indigenous peoples' representatives, civil society organizations.**
- **Together, the FACT government-to-government dialogue and its Multi-Stakeholder Dialogue will work to broker an agreement between a group of like-minded nations and non-state actors in Glasgow at the UNFCCC CoP26 of: (i) a set of principles governing the production and trade of commodities associated with deforestation; (ii) a series of road maps for immediate action in at-risk landscapes or biomes; (iii) a set of concrete commitments from producer and consumer countries and other non-state actors to deliver on these principles and roadmaps in particular geographies; and (iv) new and additional flows of public and private finance in support of these objectives.**
- **The intention is for the FACT process to lead to the creation of a long-standing partnership between governments, companies and civil society organizations intended to oversee the delivery of these principles, road maps and commitments across the world, through the 2020s.**
- **The UK Government in its role as COP26 President has agreed that the UN Food Systems Summit is a helpful and aligned forum in which to drive forward the FACT government-to-government**

<sup>3</sup> UN FAO, State of the World's Forests 2020

<sup>4</sup> As defined by the [Accountability Framework](#): *An ecosystem that substantially resembles – in terms of species composition, structure, and ecological function – one that is or would be found in a given area in the absence of major human impacts. This includes human-managed ecosystems where much of the natural species composition, structure, and ecological function are present.*



**dialogue** – as well as the associated multistakeholder dialogue led by the TFA – in advance of the official set of announcements and partnerships planned to be launched at Glasgow in November.

## 1. Summary of each proposed solution

### 2.1 What, in brief, is the solution?

- The FACT Multi-Stakeholder Dialogue is working to bring together participants from all parts of the global commodity supply chain, balancing voices from consumer and producer countries, and seeking to build a partnership of mutual respect, collaboration and trust. Previous efforts to deliver deforestation-free or ‘nature positive’ supply chains have never before had the backing of so many national governments, including some of the major producers and consumers of forest- and ecosystem-linked soft commodities. Participants include producer and consumer companies, growers, finance institutions, local farmers, foresters, ecosystem communities and indigenous peoples, civil society organisations, academics, grassroots practitioners, global and local consumer brands, regional suppliers and processors. Through involvement in the UN Food Systems Summit, the FACT Multi-Stakeholder Dialogue can bring on board more countries, civil society actors, and companies, hitherto not involved in the Dialogue.
- **Through this involvement in the UN Food Systems Summit, the FACT Dialogue can further enhance its efforts to deliver the following outcomes at COP26 in Glasgow:**
  - Creation of national and global regulatory environments which support and incentivize producers to move to sustainable production;
  - New mechanisms and packages of financial and non-financial incentives for producers to remove deforestation, habitat conversion, and human rights abuses from commodity production, based on farmer insights and suited to the specific context of high-risk geographies;
  - Greater collaboration between producing and importing countries to reinforce legislation and incentives to eliminate deforestation and conversion from key commodity supply chains;
  - Formation of technical partnerships to ensure sustainable production and trade are scaled and mainstreamed, e.g. on agricultural R&D, transparency and traceability, or enhanced market access;
  - Pre-competitive collaboration across the supply chain of key commodity producers at both global and landscape level, to establish market mechanisms to promote zero deforestation, conversion, and prevent human rights abuses;
  - Systematic inclusion and increased transparency around no-deforestation and conversion commitments and targets into investment portfolios and lending practices among key financial institutions.

### 2.2 What was/were the source(s) from which this solution emerged?

This solution arises from more than a decade of work on this agenda, involving governments, companies, and NGOs, including the Tropical Forest Alliance, the New York Declaration on Forests, the Consumer Goods Forum, the Food and Land Use Coalition, and the Good Growth Partnership, and now in 2021 a focus by the UK COP26 Presidency on bringing this issue to the forefront of its signature Nature Campaign at the COP.



This proposal has been put forward by the Forests, Agriculture, Commodity Trade Dialogue (FACT Dialogue) Multi-Stakeholder Working Group (in collaboration with The Tropical Forest Alliance (TFA), The Food and Land Use Coalition (FOLU), WWF and WBCSD)

### **2.3 What problem is it trying to address within food systems?**

The world cannot achieve the aims of the Paris Agreement to keep global temperature rise to well below two degrees Celsius without halting global deforestation and natural habitat conversion. Yet, pressure for agricultural expansion, economic development, and trade have and will continue to increase deforestation and natural habitat conversion if not comprehensively addressed. Business-as-usual in agricultural production and consumption has created unsustainable food systems that have trickle-down impacts on human rights, global food security, efficiency of supply chains, health, nutrition, and livelihoods.

Despite considerable efforts and commitments being set by the public and private sector alike to address commodity-driven deforestation and conversion, these have not yet been translated into the necessary impact on the ground. The FACT Dialogue's multi-stakeholder approach and emphasis on government involvement is the first time producer and consumer perspectives will be linked directly and systemically to broader trade and sustainable development processes.

### **2.4 Why is addressing that problem important for achieving the goal of your ACAI?**

The implementation of this game-changer will contribute to a shared sustainable development agenda for nations post-COVID-19. Fundamentally, this is about ensuring equity for producers and communities across the world, by offering the right incentives for producers, as well as ensuring sustainable food production systems that do not destroy the environment. This would lead to the elimination of the conversion of natural ecosystems (forests, grasslands, wetlands, etc.) for food production, halting biodiversity loss associated with that loss or degradation of habitat, and supporting GHG emissions reductions, all while leading to enhanced food security and more sustainable livelihoods.

### **2.5 How can this solution address that problem?**

Specifically, the participation of the FACT multi-stakeholder dialogue in the UN Food Systems Summit will:

- Provide a platform for nations already involved in the FACT Multi-Stakeholder Dialogue to engage with a wider group of interested nations, building support and momentum in advance of COP26;
- Provide an opportunity for wider inclusion of non-state actors including producer companies, consumer companies, manufacturers, brands, growers, finance institutions, local farmers, foresters, forest communities and indigenous peoples, civil society organisations, academics, grassroots practitioners, global and local consumer brands, regional suppliers and processors involved in the Summit to participate in the Multi-Stakeholder Dialogue;
- An opportunity for nations and actors already involved in the FACT Dialogue to engage with a wider group of interested nations, building support and giving momentum in advance of Cop26.

### **2.6 Why does this solution align to the definition and criteria for a 'game changing solution' developed by the Summit?**

- (1) impact potential at scale<sup>5</sup> (including return on investment): a global shift in soft commodity production and trade to zero-deforestation and natural habitat conversion, measured by concrete, time-bound commitments from producer and consumer countries, as well as from

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<sup>5</sup> Does not necessarily imply a single large intervention as opposed to enabling multiple small actions



companies and civil society organizations, to higher ambition biodiversity, climate and SDG agendas over the 2020s;

- (2) actionability (taking into account politics, capacity, costs) --- the FACT Multi-Stakeholder Dialogue enjoys the political backing of over at least 25 countries involved, and lead to a roadmap and process to take forward work post-COP26, through the 2020s;
- (3) sustainability (i.e., the ability to keep delivering to 2030 and beyond) --- it is likely that the FACT Dialogue will be funded to continue work through the 2020s, and enjoy political backing from the governments involved.

In addition, this game-changing solution aligns well with other game-changer ideas in Action Tracks 2, 4, and 5, as well as the cross-cuts on finance and innovation.

## **2.7 What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?**

- There is a significant body of evidence suggesting that governments and companies can act to eliminate deforestation and conversion in commodity supply chains, and a clear shared sense of the actions required to achieve this goal.
- Previous attempts at reform have not addressed the underlying factors that drive deforestation and conversion, such as the economic, social, and political incentives that are aligned with short-term gains and outweigh the perceived benefits of long-term climate stability. The FACT Multi-Stakeholder Dialogue's collaborative approach, backed by strong involvement from national governments, is well-placed to seek alignment between key producer and consumer countries to eliminate deforestation and conversion driven by globally traded commodities based on the foundation of trade, economic cooperation, investment, and sustainable ecosystem management.

## **2.8 What is the current and/or likely political support for this idea?**

- High level of political support from the UK government to support this idea en route to COP26 and beyond, in its role as President of COP26;
- High level of involvement and commitment from over 25 other national governments involved (see launch event [here](#).) This representation from the nations most closely linked to forest soft commodities is unprecedented when compared with previous efforts.

## **2.9 Are there certain contexts for which this solution is particularly well suited, or, conversely, contexts for which it is not well-suited at all?**

- The contexts where this is particularly important and well-suited include, but are not restricted to producer countries such as Brazil, Colombia, Indonesia, Malaysia, Ghana, Cote d'Ivoire, and Congo Basin countries (e.g. Cameroon, DRC); and consumer countries such as the UK, EU, US, India, and China. But the relevance of this agenda is ultimately global and of concern to all nation states involved in the UN Food Systems Summit.

## **2.10 Who are the key stakeholders to be further involved in the process of developing and refining the solution idea?**

- UK Government COP26 Nature Campaign
- Members of the TFA-led FACT Multi-Stakeholder Dialogue
- Food and Land Use Coalition (FOLU)
- World Business Council For Sustainable Development (WBCSD)
- World Wildlife Fund (WWF)





### 3. Strengthening Indigenous and Tribal Peoples' Rights to Management of Their Territories

#### 1. Background information

Indigenous Peoples' land cover at a quarter of terrestrial earth and 40% of landscapes without industrial level human impacts (Garner et al 2018). A major share of the world's forests is found in these areas. For example, in Latin America there are 330-380 million hectares of forest in indigenous and tribal peoples' territories. Traditionally, thanks to cultural, institutional, legal, economic, and demographic factors, tropical forests in indigenous and tribal territories in Latin America, Asia, and Africa have been much better protected than most other forests. However, these forests are increasingly threatened by outside encroachment, fires and drought, and the erosion of cultural norms and traditional knowledge. Urgent action is needed to avoid devastating consequences; not only for the territories' 200 million inhabitants but for the climate and wild species needed to sustain regional food systems.

If much of the forests these groups occupy are lost or degraded over the next few decades, local extreme temperatures will rise, putting crops and human health at risk. Rainfall will become less predictable and – in some places – scarcer. Medicinal plants, wild crop relatives, and pollinators and seed dispersers will be lost. Wildfires will damage agricultural investments and threaten human health. Livestock and people will face increasing epidemics of zoonotic disease, both new and long-standing.

#### 2. Summary of each proposed solution

##### 2.1 What, in brief, is the solution?

To strengthen the Indigenous and Tribal Peoples' capacity to manage and protect their forests require: 1) greater formal and informal recognition of their communal rights over their lands and forests and efforts to ensure these rights are respected and protected; 2) regulatory frameworks, government procurement policies, and technical and financial support for sustainable forest management and agroforestry and food systems, aligned with indigenous customary norms and traditions. 3) payments for environmental services designed to bolster communal capacity and incentives to manage forests; 4) cultural revitalization and strengthening of traditional knowledge on forest and land management; and 5) fostering a new generation of indigenous and tribal organizations, with strong participation of women and youth, which can meet the evolving challenges these communities face. These five elements are synergistic and should be treated as a package.

##### 2.2 What was/were the source(s) from which this solution emerged?

This solution is based on several reports such as the Global Assessment Reports of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), IPCC special report on land and CLIMATE, and the comprehensive report based on 300+ relatively recent studies, to be published in March by FAO and FILAC, among others. These studies provide clear compelling evidence about the magnitude and causes of the problem and the policies with proven track records to address it. The evidence base for these solutions is stronger than for most other forest policies analysed in the literature.

##### 2.3 What problem is it trying to address within food systems?



At the local level, this will help to address food security for millions of the world's inhabitants who are most vulnerable to hunger and malnutrition, by ensuring their access to forest foods, and providing them with additional sources of cash income.

At the sub-national level (and in some cases beyond) it can provide climatic benefits and environmental services related to biodiversity that can help to sustain crops, provide forage for livestock, ensure riverine fish yields, sustain water aquifers, and reduce the expansion of vector borne diseases.

## **2.4 Why is addressing that problem important for achieving the goal of your ACAI?**

At the global level, it can meaningfully contribute to increasing carbon capture, reducing carbon emissions, conserving genetic resources with multiple applied uses, and avoiding new pandemics of zoonotic diseases. At least 17% of total carbon stored in forests globally is in lands managed collectively by Indigenous Peoples and Local Communities (WHRC/RRI 2018). WRI has estimated the Net Present Value of the lower carbon emissions in the titled Indigenous territories of Brazil, Colombia, and Bolivia at between 43 and 60 billion US dollars. There are more vertebrate species in the indigenous territories of Brazil than in all of that country's non-indigenous protected areas.

## **2.5 How can this solution address that problem?**

Rigorous peer reviewed studies demonstrate that:

- Land titling and other steps to strengthen collective land tenure increase Indigenous Peoples' abilities to avoid external encroachment linked to forest destruction. Formal tenure facilitates access to government environmental incentives. Community efforts to achieve secure tenure sometimes increase their social capital and capacity for collective action. Indigenous and non-indigenous governance mechanisms can complement and serve as checks and balances for each other.
- Community forestry and agroforestry and communal payments for environmental services create incentives to maintain standing forests and can fund organizational efforts that reinforce the communities' cohesion, technical and administrative capacity to manage forests, and ability to negotiate with external actors.

There is also evidence that:

- Cultural revitalization and traditional knowledge provide useful practical knowledge for forest management, strengthens their collective identity and self-esteem and reinforces their values of reciprocity, sustainability and living in harmony with nature, among others.
- Successful indigenous and tribal governance must be accountable to diverse external and internal stakeholders, with often contradictory demands (e.g., government agencies, funders, community members), and must engage at multiple geographical scales. Meaningful participation of women and youth is essential to take full advantage of the territories' human resources, achieve social cohesion, and sustain efforts to further develop and transmit indigenous knowledge over generations.

## **2.6 Why does this solution align to the definition and criteria for a 'game changing solution' developed by the Summit?**

The 2019 IPBES Global Assessment Report found that 290 million hectares of natural forest cover was lost between 1990 and 2015, but that the loss was less severe or avoided in areas held or managed by indigenous



peoples and local communities. However, the Business as Usual (BAU) trend, is for those rates to converge, leading to much higher overall forest loss. To avoid that, an unprecedented, concerted effort is needed to avoid that “game changing trend” (towards destruction). Fortunately, all of the components required for changing the game in a positive direction have now been amply studied and validated, and are being championed by the Indigenous and tribal peoples themselves.

- All the proposed solutions are based on indigenous peoples’ proposals to the FAO, IFAD, the Convention on Biological Diversity, the UNFCCC and other multilateral bodies. There are also existing constitutions and laws recognising indigenous peoples’ rights and indigenous-sensitive policies and programmes within several regions. Most of Latin America’s political constitutions recognise the indigenous peoples’ rights and the pluri-national and multi-cultural character of these countries. A few countries in Asia, Africa, North America and Europe also have laws recognising indigenous rights. Latin America has advanced farther than in other regions in titling of Indigenous and tribal lands, community forestry, and payment for environmental services. The existing programmes could be greatly expanded, and new ones created for a relatively modest cost (often less than \$50 / hectare.) A new International Land and Forest Tenure Facility has been established to promote the implementation of existing policies favouring indigenous peoples and local communities’ rights over land and forests.
- It should be feasible to strengthen the governance and forest condition of over hundreds of million hectares of forest. That would be sufficient to significantly influence regional and global outcomes, as well as local ones. To the extent that these efforts generate economically and culturally viable institutions, enterprises, knowledge, and expectations, they should be sustainable.

## **2.7 What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?**

There are numerous rigorous peer-reviewed studies that document the environmental and social benefits of titling of indigenous and tribal territories, community forest management, and payment for environmental services in Latin America, Asia and Africa, based on existing or recent policies and programmes.

## **2.8 What is the current and/or likely political support for this idea?**

Powerful political interests oppose this solution, largely because they seek to use the indigenous and tribal peoples’ forestlands for alternative uses, such as cattle ranching, mechanised cereal production, palm oil plantations, mining, illicit crops, land speculations, and others. These groups tend to be especially powerful in the regions close to the forested territories themselves.

Nonetheless, in some countries public opinion is supportive of indigenous and tribal forest rights and management; and public awareness could increase that sentiment. There is growing consensus among inter-governmental and bilateral environmental funding and technical cooperation agencies about the importance of strengthening indigenous peoples and local communities’ rights and management of forest lands. Faith leaders, environmentalists, youth activists, and cultural figures have increasingly taken up the issue in some countries. In some of the smaller forested Latin American countries, the indigenous and tribal populations in forested areas are themselves important voting constituencies. If non-indigenous farmers understood better the benefits of indigenous managed forests for their crops, they might be more supportive.



**2.9 Are there certain contexts for which this solution is particularly well suited, or, conversely, contexts for which it is not well-suited at all?**

The Amazon Basin, Mesoamerica, Chiquitania, Cerrado, and Gran Chaco, the Congo basin, Southeast Asia are some areas where these solutions are especially relevant.

**2.10 Who are the key stakeholders to be further involved in the process of developing and refining the solution idea?**

Indigenous and tribal peoples, faith leaders, government agencies and inter-governmental agencies concerned with indigenous peoples, forests, land administration, environment, bi-lingual and intercultural education, culture, forestry and mining companies, environmental, human rights, and enterprise development NGOs, and academics concerned with these issues.



#### 4. Develop a “Codex Planetarius” to determine a set of minimum environmental standards to govern global food trade

### Background information

Where and how we produce food has arguably had the largest impact on the planet of any other human activity. Going forward, with more people, more income, and more and different consumption we need to produce more with less—less land, less water and less water pollution and fewer GHG emissions. Wasting less and consuming differently will help, but everything we consume should be produced more sustainably.

For a quarter century, WWF has worked to reduce the key impacts of the most important foods that we eat. WWF’s focus was to develop credible metrics and systems to identify the better producers, reward them with better markets and use this approach to transform commodity markets. What we have come to understand since, however, is that moving the best producers does not move the rest. Moreover, the poorer performers globally account for as much as 50% of the key environmental impacts but produce only some 10% of total production. We need to move the bottom to make the global food system more sustainable and begin a planetary journey towards more sustainable production.

### 2. Summary of each proposed solution

#### 2.1 What, in brief, is the solution?

The *Codex Planetarius* is a mandatory system that monitors the health of renewable resources used in the production of globally traded food. Focused at the planetary scale, it establishes and requires minimal performance levels for products to enter into global markets. This idea is to support the health of the planet and is based on the existing *Codex Alimentarius*, the only globally accepted standard to ensure health and safety as well as phytosanitary conditions in globally traded food.<sup>1</sup>

The *Codex Planetarius* would provide governments, businesses, trade authorities, multilateral organizations, NGOs, civil society, and other key institutions a baseline for environmental protection in the global production of food and soft commodities. The *Codex Planetarius* will harmonise and prioritise the diverse efforts of commodity-specific standards to form a cohesive, mandatory mechanism—an “umbrella” standard—to monitor how well the planet's renewable natural resources are being managed for future generations.

#### 2.2 What was/were the source(s) from which this solution emerged?

The *Codex Planetarius* idea emerged from The Markets Institute at WWF-US an entity that identifies evolving issues and trends in the global food system and tools that will help us address them. Jason Clay, Executive Director, helped launch more than twenty platforms to develop food commodity standards, agree on key impacts, work with researchers and academics to identify the precise performance metrics as well as the methodology to measure impact. It is not possible to create hundreds of standards for hundreds of globally traded food products or set a high-performance bar for global trade. But, it is possible to agree to and set minimum performance levels for a handful of key impacts and create a continuous improvement pathway for each. The *Codex Alimentarius* was an example of a similar programme created to address a set of global



problems through minimal standards and in the process, replaced thousands of separate and even contradictory certification programmes.

### 2.3 What problem is it trying to address within food systems?

There are a number of competing certification programmes and standards, and they do not focus on reducing the same impacts. Current programmes reward certified producers with market access, but it is not the better performers that produce the biggest impacts, it is the poorer performers.

Governments do not always have the funding or will to invest in the development of systems that would help them ensure that the resources that will be needed for the future are being maintained. Too many still seem to view renewable natural resources as goods to be mined without thought to whether they can be sustained at current use levels or not.

Current efforts directed at agricultural production are separate from the internationally recognised codes that are accepted by governments regarding legality and production like the World Trade Organization (WTO), or that are used to protect human health, such as the *Codex Alimentarius*. Voluntary programmes are simply not operating at the scope or scale needed to protect planetary health. A global system will not only focus on the most important sustainability issues, but also provide technology and knowhow to monitor and measure more sustainably production. The goal is to find ways to use markets not only to change those same markets but also help pay for the cost of those changes across the board.

### 2.4 Why is addressing that problem important for achieving the goal of your ACAI?

While there are many impacts from producing food globally, the most significant ones that have consistently been identified by academics, researchers and even certification programmes include biodiversity loss, habitat conversion, soil health, water take quantity, water effluent quality, GHG emissions, and agrochemical toxicity.

If we are going to reduce the most significant impacts of producing food globally, we need to agree on what those impacts are, how they should be measured, and where the line should be drawn with regard to what level of impacts should be acceptable (which may vary over time, geography and/or level of development). Standardised thinking about impacts will allow for continuous improvements. No matter where they start, all producers will be focused on the same impacts measured in the same way. Countries and companies can choose the performance levels that they want to require and producing countries can decide if they want to require the same or even higher standards for the impacts of domestic producers as well.

### 2.5 How can this solution address that problem?

Under a 'business as usual' scenario, the costs of environmental externalities are not included in food or commodity prices. One way to begin including environmental externalities in pricing is to insist on minimal environmental impact performance for globally traded food commodities. The cost of goods sold would then reflect the costs of production incorporated in compliance with *Codex Planetarius* standards.

*Codex Planetarius* would provide a roadmap for how to measure and reduce the most significant impacts of the global food system. If everyone works to reduce and measure in the same way, most significant production impacts we will make faster progress and producers will be able to learn from and share



information with others. While producers will have to make the changes on the ground, governments will ultimately need to measure and monitor these key impacts. Producer groups and buyer platforms can help support this work by sharing information through knowledge platforms and by using long-term contracts and other agreements to help create assets that producers can use to borrow against to invest in any changes that might be required.

Building on learnings from work on 25-30 different sustainability roundtables on specific crops, we know that it will be easier and more effective to focus on a single, metric/performance-based standard. None of the existing certification programmes are actually entirely performance based and many have no metrics at all—they are based entirely on practices. Moreover, there are more than 400 crops/species that are traded globally, and it would be harder to justify why 90-95% have been left out. There are often dozens of conflicting certification programmes, sometimes many more, that exist for a single crop like coffee. This was exactly the predicament the world was in with regard to health, safety, and phytosanitary conditions when the *Codex Alimentarius* was created.

We think common metrics work across all traded foods or food ingredients. If we can limit the number to 6-8, they can have a profound impact in moving the bottom, getting them to a minimal level of performance. The *Codex Planetarius*, if successful, would get all foods, commodities, and food ingredients on the same “continuous improvement escalator.” It would also allow some countries and companies to require higher performance levels than the minimal ones. Finally, while aimed at traded items, it will also (like California and the EUJ) have much broader impacts both in terms of company requirements but also on domestic production as well.

## **2.6 Why does this solution align to the definition and criteria for a ‘game changing solution’ developed by the Summit?**

As noted above in 2.5, the *Codex Planetarius* will help shift the systems of incentives and capture the true costs of the food system (see also 3.2, below, on Actionability). This proposed approach builds on WWF’s decades of experience with certification systems and standards and a clear assessment of the shortcomings. As the old adage goes, you manage what you measure. If we are going to have a more sustainable *global* food system, we need to begin to measure at a global level what is most important and then manage it. We cannot do this one crop, one farm or even one country at a time. We cannot measure everything, so we need to agree about which are the most important; and we need to measure them in the same way if we are to be most effective. In short, we have to measure and manage the planet as if our lives and those of future generations depend on it – because they do.

## **2.7 What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?**

Three reasons come to mind immediately why the *Codex Planetarius* will work.

First, *Codex Alimentarius* is far, far more complex than *Codex Planetarius*. It replaced thousands of health and safety standards of the day, each representing vested interests. Yet *Codex Alimentarius* succeeded and was launched in a matter of years, though it has taken decades to become what it is today. Over that time, it has systematically reduced consumer health and safety issues associated with the global trade of food items. It has also affected domestic consumption, as countries and companies use it to ensure food safety domestically



as well as to meet export requirements. Perhaps most important, it represents global agreement and a scientific base about what is important, how to measure it, and how countries can comply with global export requirements. It proved to be important over time for identifying and acting on new issues.

Second, we have seen one certification programme use metrics and continuous improvement to make significant gains to reduce the key environmental impacts of cotton production and particularly the impacts of small farmers in Africa and Asia. The Better Cotton Initiative is one of the few certification programmes that is based on continuous improvement and has the explicit intent to help improve the poorest performers. It has been successful in helping move poor performers along the performance curve, including some with the worst impacts. In a very short time, they have reduced key impacts such as the use of water, fertilizer and pesticide while also improving farmer productivity and net income.

Third, many global food companies have long asked for performance requirements that can be applied to all the different food products that they purchase. They want a single system that applies to all food crops and all exports. With such a system, the cost of minimal performance against key impacts, both measurement and verification, would be the same for any company that buys those commodities. There would be no freeloaders. Those companies that want better performance could still seek that, based on the most important impacts with consistent measurement.

## **2.8 What is the current and/or likely political support for this idea?**

The UK government is currently looking at this. Officials are considering a recommendation that they position the *Codex Planetarius* concept at the COP, CBD, WTO and in all its new trade agreements. The FAO has looked at the concept and likes it but has decided not to move it forward unilaterally. WWF is in discussions about the concept with the Biden administration, including the head of USDA, the new Climate Czar, and the State Department, and we can begin discussion in the EU in a timely way as the concept moves forward.

The World Business Council for Sustainable Development (WBCSD) has used its platform to publicise the concept. WWF is in touch with the Consumer Goods Forum (CGF), the Sustainable Agriculture Initiative Platform (SAI), and the World Economic Forum (and its subgroup, the Tropical Forest Alliance) about the concept. These discussions are just beginning, and it is best that they remain quiet until they are somewhat further along or at least until the groups explicitly agree to be named or to endorse the *Codex Planetarius*.

## **2.9 Are there certain contexts for which this solution is particularly well suited, or, conversely, contexts for which it is not well-suited at all?**

This approach is better suited for agricultural production than for food production in marine environments (either wild-caught fisheries or aquaculture), though the same thinking could be applied. The approach would be easier for plant-based production than for livestock, especially if the latter require non-farm sources of feed and feed ingredients. The approach is probably easier to implement with larger-scale producers than smaller ones. It is easier to perform in countries that are data rich and have more infrastructure for research and analytics.

The approach is less well suited for small-scale producers, and yet that is where some of the biggest impacts can be with food production. While it would be harder to implement the programme in data-poor countries, they will need to develop programmes to monitor the impacts of climate change and use for carbon



accounting going forward, so this would be adding a lot of new information to monitor on the environmental impacts of production.

## 2.10 Who are the key stakeholders to be further involved in the process of developing and refining the solution idea?

The following groups need to be involved to ensure that the *Codex Planetarius* is acceptable, implementable, and cost effective:

- Producers need to understand and sign off on the concept. Incentives would help.
- Global food companies need to see that this strategy will help make food production and their global supply chains more sustainable and resilient, regardless of where they sit along the value chain.
- NGOs need to ensure that the key impacts are included and addressed but be disciplined enough not to make the list so long that it becomes too expensive to implement.
- Individual researchers, universities and national research organizations will need to weigh in on the key impacts, minimal performance levels that are fair but meaningful, the different weighting by geography and commodity, etc.
- Governments need to understand the value of the *Codex Planetarius* as protecting global trade and market access while also ensuring food security local as well as resilient production and producers.
- Multilateral organizations like the UN FAO (the home of *Codex Alimentarius*), the World Bank, the IFC, regional banks, and bi-lateral development organizations (e.g., CDC and DFID, US AID, GTZ) will benefit from this approach because it will help them focus their work and measure their results.

## 3. Any Other Remarks or Comments

### 3.1 Impact potential at scale (including return on investment)

The *Codex Planetarius* will establish a global minimum standard for the impacts that are acceptable for food to be legally exported internationally. This global benchmark and how it is measured will ensure that all countries are monitoring and measuring the same things, so that we can see a snapshot of the state of the world's food system – where it is doing well, and which impacts are not being reduced as quickly as needed to address climate change, population growth, and increased / shifting consumption.

Additional research will be encouraged to show the knock-on effects of reducing key impacts on GHG reductions, water availability and quality, soil health, productivity, as well as if there are any unintended environmental, social, or economic impacts of *Codex Planetarius* that need to be addressed going forward. Research will also be undertaken to show the impact of meeting or exceeding *Codex Planetarius* performance levels on the resilience of food producers individually and production systems generally in the face of climate change, either in absolute or relative terms compared to business as usual (e.g., the starting baseline).

### 3.2 Actionability (taking into account politics, capacity, costs)

*Codex Planetarius* will work best when it becomes a global norm. Countries will need to sign on and agree to do their part to develop the systems to measure and report against the different impacts associated with the food products that they export. This will take some years to implement completely and will most likely require



funding and technical support from importing country governments and/or companies to ensure the rigour and timeliness that will be necessary to implement any commitment to the *Codex*.

From the outset, it will be important to identify and assess the strategies that countries might use to cover additional costs of implementing the system. For example, could they be covered by export earnings or earmarked sources of funds that could be included in and covered under the “costs of goods sold” calculations – in effect, the all-in export price. There may be various ways to cover the costs. More research will need to be done on the business model of *Codex Alimentarius* to see if valuable information can be gleaned about how to create a similar system by building on the lessons learned over the past 60 years without simply repeating them.

### **3.3 Sustainability (i.e., the ability to keep delivering to 2030 and beyond)**

The *Codex Planetarius* is intended to ensure that globally traded food is produced more sustainably by measurably reducing the key environmental impacts of food production. It also provides a common pathway and metrics for continuous improvement of both globally traded and domestically consumed food. While there have been no definitive global studies, anecdotal evidence suggests that as producers reduce their key impacts, they will tend to be more resilient (and less affected by climate change), have better market access, be more efficient and use inputs more efficiently, be more productive, and, as a result, be more profitable.



## 5. Global movement to protect (and restore) riparian buffers in private agricultural lands (including legal requirements to protect private lands, bioeconomy)

### 2.1 What, in brief, is the solution?

To protect (and, wherever necessary, restore) native vegetation within private agricultural lands that acts as buffers to rivers, streams, wetlands, springs, etc. These water sources are often severely impacted, in both quantity and quality (sedimentation, pollution, etc.), if agricultural practices disregard their protection. This type of impact affects agricultural productivity itself (e.g., irrigation), and in many instances it may also hinder supply to cities and settlements, hydro energy generation, biodiversity, among others.

### 2.2 What was/were the source(s) from which this solution emerged?

It was consensual among ACAI members.

### 2.3 What problem is it trying to address within food systems?

This solution reduces the impact of agriculture on water sources that are potentially important for human and animal supply, energy, biodiversity conservation, and agriculture itself. In addition, it reduces deforestation, promotes vegetation restoration, and stocks and sequester carbon.

### 2.4 Why is addressing that problem important for achieving the goal of your ACAI?

Riparian vegetation within private lands often functions as corridors that connect larger vegetation blocks, for instance, within publicly protected areas. These corridors allow species and gene flow, which are essential for biodiversity and genetic conservation. Of course, protection of water sources and their marginal vegetation is also a key strategy to promote conservation of freshwater species as well. Moreover, riparian vegetation, alongside with wetlands in general, have a well-recognised role in carbon storage and sequestration.

### 2.5 How can this solution address that problem?

For this solution to happen, a combination of regulatory and incentive policies will need to be in place at national-level that control and promote protection and restoration of riverine vegetation. While governments are expected to design, implement and enforce regulatory components, incentive policies (e.g., payment for ecosystem services) could be promoted not only by governmental actors, but also by the private sector (in not only the food business, but eventually also actors related to energy, cities, etc.). Government and academia could measure and assess the value of these private protected areas for biodiversity conservation and carbon mitigation. Whenever effectiveness is verified, these areas should account for national balance of protected areas as "Other Effective Area-Based Conservation Measures" (OECM), as defined by the Convention of Biological Diversity. In parallel, carbon storage and sequestration could be incorporated to the carbon balance of those actors interested in incentivising protection and restoration. The final scenario would be a global network of protected areas within private farmlands, which would provide corridors and connectivity to the global network of protected areas.

### 2.6 Why does this solution align to the definition and criteria for a 'game changing solution' developed by the Summit?



Game-changing and systemic solutions in the scope of this report must have impact potential at scale, actionability (taking into account politics, capacity, costs), and sustainability (i.e., the ability to keep delivering to 2030 and beyond).

The potential for scale is global, but it requires political will, engagement of the private sector, multilaterals and collaboration by farmers and local communities. This solution has the potential to directly address some of the 17 objectives of the 2030 Agenda (2, 13, 15) and indirectly a set of others (1, 7, 8, 11, 17), and it also conforms to the guidelines of the UNFCCC and the CBD.

## **2.7 What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?**

Brazil provides existing evidence both on the feasibility of this solution and on the challenges it may face nationally and locally. The country has its Native Vegetation Protection Law that regulates that farmers countrywide should protect or restore riparian vegetation in their properties, including wetlands, springs and other water sources. The financial sector is engaged with the implementation of the law and conditions credits and loans to farms that abide to the legislation. The government has an effective monitoring mechanism. However, the current political scenario is preventing the legislation from fully flying. When all farms abide to the legislation, Brazil will have at least 2 times more protected areas in private properties than it has in its already extensive public network of protected areas. Similar proportion between the two types of protection will also apply to ensured carbon storage and sequestration.



## E. Solutions from ACAI Manage

### 6. Transforming agricultural innovation for climate, nature and people

#### a. Background

The World Bank estimates that around USD 56 billion is spent every year on agricultural research and development (Fuglie et al., 2020). While this investment is crucial for food security, it is not necessarily delivering benefits for nature and climate. Agriculture has been a major driver of nature loss, and a contributor to greenhouse gas emissions, even while both men and women small-scale farmers are at the frontline of facing impacts of climate change and nature loss. It is widely recognized that a major transformation of food systems is needed (Steiner et al., 2020, Pharo et al., 2019, Loboguerrero et al., 2020). However, for a successful transformation requires a transformation in the underpinning innovation systems (Steiner et al., 2020, Fanzo et al., 2020, Herrero et al., 2020, Barrett et al., 2020). We build upon recommendations of the global initiative to Transform Food Systems Under Climate Change, which engaged over 100 organizations to develop its flagship report, 'Actions to Transform Food Systems Under Climate Change', and further elaborate the solution based on ideas received under ACAI2.

#### b. What, in brief, is the solution?

The solution envisages shifting the dial on agricultural innovation, with greater investment into innovation, efforts to address fragmentation among institutions, and to scale and evidence-based dialogue. The solution also proposes investing into initiatives that have demonstrated the ability to provide end-to-end solutions working across the innovation ecosystem for food systems (from early stage development to product development to large scale deployment), where research efforts are targeted towards end user needs underpinned by robust partnerships to ensure adoption and societal outcomes at scale. Some examples of these initiatives are constituted by the Local Technical Agroclimatic Committees in Latin America, the use of big data to scale Climate-Smart Agriculture, the Climate-Smart Villages, the Global Lighthouse Farm and the newly emerging multi-stakeholder initiative to decarbonize food systems by the World Economic Forum and partners. Likewise, this solution will promote diverse mechanisms to achieve transformation in innovation systems by incentivizing the use of approaches such as (i) participatory scenario building with policy actors, donors and stakeholders, including gender characterized producers and consumers (participatory scenario building has been used successfully to build legitimacy, ownership and trust for policy agendas that tackle bottlenecks, enhance opportunities and stimulate action) and (ii) Climate-Smart Agriculture Investment Planning and Financing as a way to leverage stakeholder engagement and capacity building for proposing high potential and high-suitability Climate-Smart Agriculture investment projects.

#### c. What was/were the source(s) from which this solution emerged?

This solution is proposed in the 'Actions to Transform Food Systems Under Climate Change' report (Steiner et al., 2020), which was developed in collaboration with over 100 organizations and was proposed through the Google form.

#### d. What problem is it trying to address within food systems?

Business as usual in agricultural innovation will not catalyze the transformation in food systems that is needed for nature-positive production at scale, and this solution seeks to unlock this 'lock in' to a system of innovation which does not always deliver benefits for nature and climate, and is often fragmented, and not focused on outcomes for society.

#### e. Why is addressing that problem important for achieving the goal of your ACAI?



This solution can have transformational impact and help achieve the aspirational outcome of sustainably managing existing food production systems to the benefit of nature and people, helping develop an innovation system that provides context specific solutions to increase input efficiencies, minimize externalities, improve yields, maximize biodiversity and ecosystem functions, improve livelihoods and enhance resilience to climate change.

**f. How can this solution address that problem?**

Our theory of change envisages four key inputs to make this solution successful:

- **Inclusive dialogue to identify and prioritize evidence-based approaches**, as well as to ensure addressing **gender and social inclusion** explicitly as part of this transformation. The gender gap in innovation needs to be overcome as women often do not have access to the same level of resources as men.
- **Increase investment in R&D, technology, knowledge sharing**, which enable climate-positive, nature-positive and people-positive pathways for development. This does not mean only the development of new technologies and practices, but a focus on taking these to scale to realise multiple objectives.
- **Realign agricultural innovation systems to address climate change**. National and international institutions responsible for agricultural innovation needs to become fit for purpose to achieve multiple outcomes. This solution will focus on realigning institutions to address fragmentation and streamlining efforts for greater impact. This will involve changing incentive structures, management and governance for researchers and the public sector in agricultural research and development systems to value the generation of societal outcomes, thus ensuring greater uptake of research results by food systems stakeholders.
- **Identify and scale best practices of taking innovation to scale**. These best practices connect capital providers, researchers, and end-users to provide a research-for-development “ecosystem for innovation” that enables stakeholders to accelerate the transformation needed in food systems. Examples of such best practices are provided in section 1.1.

**g. Why does this solution align to the definition and criteria for a ‘game changing solution’ developed by the Summit?**

The innovation system underpins activities across the entire food system, and unless this innovation system is transformed, we will not be able to transform food systems. The investments in innovation are significant and shifting the dial on these can have huge impacts. Such a shift is actionable at the Summit, as there is strong support for this under the UK’s COP26 Presidency<sup>6</sup>. Together these two summits can change how we innovate in the face of climate change and nature loss. Once a shift has been achieved it is possible to sustain this beyond 2030 as this becomes the new era of innovation, characterized by ‘end to end’ approaches to innovation.

**h. What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?**

The initial theoretical background comes from the ‘Action to Transform Food Systems Under Climate Change’ report (Steiner et al., 2020), which has seen input from over 100 organizations. Taking these theoretical foundations forward, five evidence reviews are currently underway as part of the COP26 campaign to transform agricultural innovation for people, nature and climate.

**i. What is the current and/or likely political support for this idea?**

This idea has been subject to stakeholder input and consultations since September 2020, and over 20 member states have now been engaged in this idea. Strong support from member states is crucial as agricultural

<sup>6</sup> Transforming Agricultural Innovation for People, Nature and Climate campaign, part of the UK’s Nature campaign for COP26  
<https://ccafs.cgiar.org/news/Transforming-Agricultural-Innovation-Climate-Nature-People>



innovation continues to be funded predominantly with public funds. However, we are also engaging the private sector to shift the dial on private investment in innovation. So far, we have not seen opposition to the idea as it is acknowledged that business as usual is not an option. The UK Government has expressed support for this idea in particular and this solution was launched by the Rt Hon Lord Goldsmith, UK Minister for Pacific and the Environment at FCDO and the Department for Environment, Food and Rural Affairs (Defra) at the 2021 Climate Adaptation Summit.

**j. Are there certain contexts for which this solution is particularly well suited, or, conversely, contexts for which it is not well-suited at all?**

This solution needs to occur across contexts as all countries invest in innovation, however low- and middle-income countries with a dependence on agriculture as a sector are a priority, as this solution can enable them to leapfrog the agricultural development curve, delivering benefits for people, nature and climate.

**k. Who are the key stakeholders to be further involved in the process of developing and refining the solution idea?**

Member states who are key funders and beneficiaries of agricultural research, private companies that invest in innovation, and regional and international innovation organizations.

## References

- BARRETT, C. B., BENTON, T. G., COOPER, K. A., FANZO, J., GANDHI, R., HERRERO, M., JAMES, S., KAHN, M., MASON-D'CROZ, D., MATHYS, A., NELSON, R. J., SHEN, J., THORNTON, P., BAGEANT, E., FAN, S., MUDE, A. G., SIBANDA, L. M. & WOOD, S. 2020. Bundling innovations to transform agri-food systems. *Nature Sustainability*, 3, 974-976.
- FANZO, J., COVIC, N., DOBERMANN, A., HENSON, S., HERRERO, M., PINGALI, P. & STAAL, S. 2020. A research vision for food systems in the 2020s: Defying the status quo. *Global food security*, 26, 100397-100397.
- FUGLIE, K., GAUTAM, M., GOYAL, A. & MALONEY, W. F. 2020. *Harvesting Prosperity: Technology and Productivity Growth in Agriculture*, Washington DC, World Bank.
- HERRERO, M., THORNTON, P. K., MASON-D'CROZ, D., PALMER, J., BENTON, T. G., BODIRSKY, B. L., BOGARD, J. R., HALL, A., LEE, B., NYBORG, K., PRADHAN, P., BONNETT, G. D., BRYAN, B. A., CAMPBELL, B. M., CHRISTENSEN, S., CLARK, M., COOK, M. T., DE BOER, I. J. M., DOWNS, C., DIZYEE, K., FOLBERTH, C., GODDE, C. M., GERBER, J. S., GRUNDY, M., HAVLIK, P., JARVIS, A., KING, R., LOBOGUERRERO, A. M., LOPES, M. A., MCINTYRE, C. L., NAYLOR, R., NAVARRO, J., OBERSTEINER, M., PARODI, A., PEOPLES, M. B., PIKAAR, I., POPP, A., ROCKSTRÖM, J., ROBERTSON, M. J., SMITH, P., STEHFEST, E., SWAIN, S. M., VALIN, H., VAN WIJK, M., VAN ZANTEN, H. H. E., VERMEULEN, S., VERVOORT, J. & WEST, P. C. 2020. Innovation can accelerate the transition towards a sustainable food system. *Nature Food*, 1, 266-272.
- LOBOGUERRERO, A. M., THORNTON, P., WADSWORTH, J., CAMPBELL, B. M., HERRERO, M., MASON-D'CROZ, D., DINESH, D., HUYER, S., JARVIS, A., MILLAN, A., WOLLENBERG, E. & ZEBIAK, S. 2020. Perspective article: Actions to reconfigure food systems. *Global Food Security*, 26, 100432.
- PHARO, P., OPPENHEIM, J., LADERCHI, C. R. & BENSON, S. 2019. Growing Better: Ten Critical Transitions to Transform Food and Land Use. Food and Land Use Coalition
- STEINER, A., AGUILAR, G., BOMBA, K., BONILLA, J. P., CAMPBELL, A., ECHEVERRIA, R., GANDHI, R., HEDEGAARD, C., HOLDORF, D., ISHII, N., QUINN, K. M., RUTER, B., SUNGA, I., SUKHDEV, P., VERGHESE, S., VOEGELE, J., WINTERS, P., CAMPBELL, B., DINESH, D., HUYER, S., JARVIS, A., LOBOGUERRERO, A. M., MILLAN, A., THORNTON, P., WOLLENBERG, L. & ZEBIAK, S. 2020. Actions to Transform Food Systems Under Climate Change. Wageningen, The Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).



## 7. Adopting nature-positive livestock production systems

### a. Background

The livestock production system is often under the spotlight for being responsible for environmental losses (e.g. greenhouse gas emissions, deforestation, water utilization), however, we think that we also have to consider its potential in soils regeneration<sup>7</sup>, fertility, carbon sequestration<sup>8</sup>, biosystem integration and the high nutrition value of animal-sourced foods; and animal by-products good for the soils such as manure and urine. Moreover, there is a need for increasing animal-based protein supply for a more balanced dietary system in most developing areas of the world. In this respect, both women and men farmers are ready to commit to the achievement of a more sustainable livestock sector, based on practices towards sustainable intensification of production with concrete actions and metrics along the value chain of animal source products. Globally, livestock contribute about 40% of agricultural gross domestic product (GDP) and provide livelihoods and incomes for at least 1.3 billion people.<sup>9</sup> It is the livestock economy that we find more women and vulnerable groups owning livestock assets compared to other agricultural sectors.

By applying an authentic farmers-driven approach we will move in the direction of global sustainable agricultural sector, including the livestock sector. Sustainable livestock farming is based on the three principles: 1. improving resource efficiency, 2. strengthening resilience and 3. securing social equity and responsibility of livestock production systems, according to the World Farmers Organization (WFO) policy paper on Sustainable Food Systems<sup>10</sup>. Our sustainable livestock solution is supported by the WFO Scientific Council evaluation framework of “SAFER Foods for a Sustainable World”, which was adopted by the WFO Board as a preparation for the UNFSS, and which enabled contributors from the WFO network to evaluate projects and ideas in terms several dimensions of sustainability, including also economic and ethical sustainability of farming<sup>11</sup>. For this purpose, we have selected exemplary projects that represent some of the best livestock practices with the aim to support and amplify their positive actions not only for the environment but also for farmers’ associations (men and women).

### b. What, in brief, is the solution?

Innovation is key to unlock the potential of sustainable development in agriculture, including livestock farming. Fostering innovative methods, however, requires strong collaboration between both male and female farmers, science, politics and business sectors. Innovation is key to unlock the potential of the livestock sector as the heart of the functioning and transformation of food systems: innovation is a system that consists of a wide range of public and private actors and includes the rules and instruments by which these different stakeholders interact and relate with one another in social, political, economic and institutional settings. Innovation can include products, processes, markets, institutions; it can be technological, social, and organizational. This means that innovation processes in sustainable livestock will be directed not only to what happens at the production level but involve all the stages of the food value chain and all the components of food systems.

<sup>7</sup> Teutscherova, N., Vazquez, E., Sotelo, M., Villegas D., Velásquez N., Baquero D., Pulleman, M., Arango, J. 2021. Intensive short-duration rotational grazing is associated with improved soil quality within one year after establishment in Colombia. *Applied Soil Ecology*. 159. doi.org/10.1016/j.apsoil.2020.103835.

<sup>8</sup> Aynekulu, E.; Suber, M.; van Noordwijk, M.; Arango, J.; Roshetko, J.M.; Rosenstock, T.S. 2020. Carbon Storage Potential of Silvopastoral Systems of Colombia. *Land*, 9, 309.

<sup>9</sup> <https://www.ilri.org/>

<sup>10</sup> Adopted in June 2020, [https://www.wfo-oma.org/wp-content/uploads/2020/07/WFO-Policy-Paper-on-Sustainable-Food-Systems-approved-by-the-WFO-2020-GA\\_EN.pdf](https://www.wfo-oma.org/wp-content/uploads/2020/07/WFO-Policy-Paper-on-Sustainable-Food-Systems-approved-by-the-WFO-2020-GA_EN.pdf)

<sup>11</sup> Available here: [https://www.wfo-oma.org/wp-content/uploads/2021/02/WFO\\_SAFER-Foods-for-a-Sustainable-World.pdf](https://www.wfo-oma.org/wp-content/uploads/2021/02/WFO_SAFER-Foods-for-a-Sustainable-World.pdf)



Sustainable livestock innovation will be driven by all categories of farmers, but only through public/private partnerships can the results be really effective and aligned to the three dimensions of sustainability. A sustainable use of innovative technologies in breeding, feeding, vaccinations, IOT, communications and more, when appropriately packaged in business models, and adapted to socioeconomic conditions of the target communities, have the demonstrated potential to move the needle on resources productivity in livestock, even while contributing positively to biodiversity habitats. Political and cultural dimensions will be respected in the deployment of innovative technologies for sustainable livestock. Moreover, extension services and training directly to women<sup>12</sup> and young farmers<sup>13</sup> have proven to have positive impact on the development of sustainable livestock food systems worldwide, especially in developing countries.

**c. What was/were the source(s) from which this solution emerged?**

Experience background of ACAI members network as well as the open-source contribution channel including numerous validated technologies of sustainable livestock practices.

**d. What problem is it trying to address within food systems?**

The livestock sector is often accused to be responsible for biodiversity degradation, excessive water use, desertification and greenhouse gases emissions. However, it holds a great potential in fostering soils health<sup>14</sup>, soil fertility, an increased carbon sequestration and biodiversity services, which make the sector actually nature positive. Applying sustainable innovative methods in livestock means addressing climate change both on the mitigation<sup>15</sup> and adaptation side.

Natural resources, especially water and soil, are essential for the functioning and structure of agricultural production systems and for overall social and environmental sustainability. A smart management of resources (soil, water, energy, inputs) is essential for gender-categorised livestock farmers to ensure they can meet the global goal of food security while improving the profitability of their activity. Innovative livestock smart-farming solutions that are climate-friendly and environmentally sustainable exist and need further support. While Precision Agriculture tools have the potential to shape the sustainability of the agricultural sector in an effective way, their deployment in the livestock sector is scarce, probably due to affordability and utilization of those technologies by all types of men, women and young farmers and the support needed to ensure that this happens. We acknowledge the importance of understanding if livestock producers are ready to adopt these technologies and what they need to do it.

Moreover, sustainable livestock contributes to the adoption of a one health approach. In fact, the reduction of diseases of animal origin and the fight against antimicrobial resistance can be achieved through the dissemination of good practices of livestock management. The first and fundamental principle, to our understanding, is that a given solution is suitable for the farmers only if it is also economically viable as is sustainable livestock<sup>16</sup>. Critically, this includes respecting and paying the local cost of capital.

**e. Why is addressing that problem important for achieving the goal of your ACAI?**

Considering that the estimated total number of livestock units worldwide surpasses 17 billion units, that about two-thirds of the world's total agricultural area is dedicated to livestock production and that the value

<sup>12</sup> Gumucio T. Mora Benard M. A. Clavijo M. Hernández M. C. Tafur M. Twyman J. 2015 Silvopastoral Systems in Latin America: Mitigation Opportunities for Men and Women Livestock Producers. CCAFS Policy Brief. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), Copenhagen. 8 p.

<sup>13</sup> Triana-Angel N, Ariza Aya M, Burkart S. 2020. Youth in livestock and the transformative power of rural education: the case of Heirs of Tradition, 2012–2020. CCAFS Info Note. Cali, Colombia: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

<sup>14</sup> Horrocks, C., Arango, J., Arevalo, A., Nunez, J., Cardoso, J. & Dungait, J. 2019. Smart forage selection could significantly improve soil health in the tropics. *Science of the total environment*, 688. 609–621. DOI: 10.1016/j.scitotenv.2019.06.152

<sup>15</sup> Arango, J., Ruden, A., Martinez-Baron, D., Loboguerrero, A. M., Berndt, A., Chacón, M., Torres, C. F., Oyhantcabal, W., Gomez, C. A., Ricci, P., Ku-Vera, J., Burkart, S., Moorby, J. and Chirinda, N. 2020. Ambition meets reality: achieving GHG emission reduction targets in the livestock sector of Latin America. *Frontiers in sustainable food systems*. 4:65. DOI: 10.3389/fsufs.2020.00065

<sup>16</sup> Burkart, S. 2020. Making money with sustainable intensification: Opportunities for the beef and dairy sector in developing countries. Poster prepared for the Virtual Livestock CRP Planning Meeting, 8–17 June 2020. Cali, Colombia: Alliance of Bioversity International CIAT.



of livestock as a global asset reaches more than a trillion USD globally<sup>17</sup>, sustainable livestock is central to our ACAI. Furthermore, due to the enormous mitigation and soil regenerative potential of the livestock sector complemented with the production on nutritious food for marginalized communities, both WFO and CGIAR cannot imagine a sustainable food system that provide for humankind while respecting our planet without accounting for sustainable livestock. It is worth highlighting how the spread of sustainable livestock farming contributes to the protection and conservation of biodiversity. Thanks to them, it is possible to reverse the trend of converting land used for grazing into fields for cultivation, altering its conformation and reducing the biodiversity of that area. In temperate regions, grass is capable of restoring degraded soil and storing carbon from the atmosphere: sustainable livestock contributes greatly to preserving soil and grass health. Long-stabilized grasslands store more carbon and are also very important to pollinating insects, providing food in late summer from grasses, meadow flowers, flowering clover and other legumes. In the recent years, both CGIAR research programs on Livestock and Climate Change, Agriculture and Food Security (CCAFS) have intensified efforts on research for development approaches so together with WFO we call for further support to sustainable livestock cases as detailed in section 2.5.

#### f. How can this solution address that problem?

We showcase some examples of “moving-the needle” technology applications:

- **Ethiochicken** is a company in Ethiopia which in a combination of a robust dual-purpose poultry breed with advanced feed-, vaccination-, and farm management methods has tripled the per person egg supply in Ethiopia between 2015 and 2020. The company enabled the creation of 6000+ small enterprises and strengthened the socioeconomic livelihood of around 2 million rural small-scale farmers in the country in a short time-span. Most beneficiaries of these improvements are the livelihoods of women and children as the usual livestock keepers in these households.
- **IOT and sensing technologies** make it possible to monitor the health of individual animals even in large scale herds and provide them automatically with individualized feeding rations, such as in pig-pens, salmon cages, dairy operations or cattle feedlots. These systems significantly reduce mortality of animals, increase their health and welfare and increase feed conversion ratios.
- **High density and ultra-HD grazing methods** in combination with regenerative practices, can multiply livestock yields from a given patch of grazing land, while at the same time increasing rates of carbon sequestration, soil health and soil biodiversity. There are thousands of well-documented examples of this on all continents by now, demonstrating the multiple win potential for increased resource productivity, natural enhancement and economic sustainability for farmers.
- **Feed additives to reduce enteric methane** ruminant livestock sector, both from natural<sup>18,19</sup> and chemical sources<sup>20</sup>. This will nearly reduce 40% of the IPCC declared amount of GHG emissions of global agriculture, amounting to the single largest leverage technology among all GHG reduction measures across all commodities from agriculture.

17. Rao, I., Ishitani, M., Miles, J., Peters, M., Tohme, J., Arango [...], & Cadisch, G. 2014. Climate-smart crop-livestock systems for smallholders in the tropics: Integration of new forage hybrids to intensify agriculture and to mitigate climate change through regulation of nitrification in soil. *Tropical Grasslands – Forrajes Tropicales* 2: 130–132. DOI: 10.17138/TGFT(2)130-132

18 Ku-Vera J., Jiménez-Ocampo R., Valencia-Salazar S., Montoya-Flores D, Molina-Botero I, Arango J, Gómez-Bravo C, Aguilar-Pérez C & Solorio-Sánchez F. 2020 Role of Secondary Plant Metabolites on Enteric Methane Mitigation in Ruminants. *Front. Vet. Sci.* 7:584. doi: 10.3389/fvets.2020.00584

19 Vijn S, Compart DP, Dutta N, Foukis A, Hess M, Hristov AN, Kalscheur KF, Kebreab E, Nuzhdin SV, Price NN, Sun Y, Tricarico JM, Turzillo A, Weisbjerg MR, Yarish C and Kurt TD. 2020. Key Considerations for the Use of Seaweed to Reduce Enteric Methane Emissions From Cattle. *Front. Vet. Sci.* 7:597430. doi: 10.3389/fvets.2020.597430

20 Meale, S.J., Popova, M., Saro, C. et al. Early life dietary intervention in dairy calves results in a long-term reduction in methane emissions. *Sci Rep* 11, 3003 (2021). <https://doi.org/10.1038/s41598-021-82084-9>



- **GANSO (Sustainable Livestock) initiative**<sup>21</sup> in Colombia is committed, through technical and financial assistance, to the professionalization of livestock activity, to make it more sustainable through solutions tailored to each farm and making these solutions transparent throughout the food chain, all the way to the retailers and consumers.
- **The Dairy Sustainability Framework** is a pre-competitive and collaborative model that drives and reports on continuous improvement in the dairy value chain in all locations. The framework caters for the diversity of world milk production allowing local solutions to be identified and implemented in the social, economic and environmental aspects of milk. Currently the Framework covers 30% of global milk production. [www.dairysustainabilityframework.org](http://www.dairysustainabilityframework.org)

**g. Why does this solution align to the definition and criteria for a ‘game changing solution’ developed by the Summit?**

The examples mentioned in 2.5 have a proven track record of change rates of productivity increases in a time-scale of just a few years, and in the process creating system-wide impact on human and natural capital. That demonstrates their scalability, their immediate impact potential and clearly their actionability.

**h. What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?**

Company records, public announcements, case study documents and various scientific analyses.

**i. What is the current and/or likely political support for this idea?**

Political support for sustainable livestock farming development and innovation: catalyzing States capacity to drive transformation is crucial. Not only financial and investment support are required, but also a policy framework that recognizes the role of livestock sector as a driver for sustainability of rural growth and social transformation in rural areas. This predisposition by governments is key to unleash the potential of agriculture as a multifunctional sector.

Political inclusiveness: women and young farmers are still lacking possibilities to be involved in the decision making as they experience the biggest challenges in having access to resources. Livestock sector policies should be repurposed to ensure that women and youngsters are involved in policy processes at all levels and have access to leadership positions to give voice and advocate for their own specificities while being representatives of the wider livestock farmers’ community.

**j. Are there certain contexts for which this solution is particularly well suited, or, conversely, contexts for which it is not well-suited at all?**

In general, almost all animal farming contexts can profit from these technological and organizational breakthroughs that have manifested in recent years.

**k. Who are the key stakeholders to be further involved in the process of developing and refining the solution idea?**

Since the development of a lasting and effective solution needs a broad and systemic approach, it is possible to consider the involvement of different types of stakeholders who can participate collaboratively: of course, considering gender differentiated farmers and the organisations that protect their interests as the core of this new process, stakeholders from the feed industry could be involved, [...]. Moreover, since the sustainable transformation of economic sectors is a fast-growing global trend that also has inevitable impacts on financial institutions, it would be possible to involve different types of stakeholders from this sector in the process: banks, insurance companies and funds could benefit greatly from financing solutions

<sup>21</sup> Ruden A, Castro JP, Gutiérrez JF, Koenig S, Arango J. 2020. GANSO: New business model and technical assistance for the professionalization of sustainable livestock farming in the Colombian Orinoquia region. CCAFS Info Note. Cali, Colombia: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).



related to sustainable livestock also because of its long-term profitability. Stakeholders from the research and academic sector could also naturally contribute, by carrying out targeted research that supports the concrete effectiveness and credibility of the development of new solutions vis-à-vis all other stakeholders, directly or indirectly involved in the process.



## 8. Adopting regenerative agricultural practices for resilient landscapes at scale

### a. Background

There is growing recognition food systems can and must shift from extractive and degrading to more restorative, equitable and productive. Regenerative food systems contemplate a new food economy which endogenizes these values through new management practices supported by the right combination of new knowledge, market signals and policies. Yet, food systems cover vast and diverse areas of terrestrial, marine and freshwater ecosystems, accounting for more than \$10 trillion in annual economic activity. There is significant urgency to unlock widespread adoption of regenerative management practices, given the growing challenges of malnutrition, poverty, climate change and biodiversity loss. This solution proposes a network of *Regenerative Foodscapes* as sentinels for a new regenerative food economy. Regenerative Foodscapes are important food producing land or sea scapes offering the ability to customize and scale up the right suite of solutions given a set of geographically unique biophysical, jurisdictional, market and cultural considerations under a collective action development model. While many regenerative practices may ultimately fit into this game changing solution, we focus on how to accelerate the pace of change across the global food system with a novel network design of collectively managed and promoted Regenerative Foodscapes.

### b. Brief Description

Regenerative agriculture is a system of farming, grazing and fisheries management principles and practices that seek to rehabilitate and maintain the functions of terrestrial and aquatic agroecosystems that guarantee the preservation of the foundation of sustainable food production: soils, biodiversity, water, nutrient cycling. By maintaining and rehabilitating these functions, agroecosystems improve their capacity to regenerate in a changing environment. Securing the regenerative capacity of agroecosystems increases their resilience to climate change events and other environmental shocks. It also positions agriculture and food systems as a large-scale solution provider of environmental benefits, while supporting livelihoods. This includes farming methods moving beyond resource efficiency and into ecological restoration through practices such as conservation tillage, cover cropping and rotations, agroforestry and other forms of diversification, mobile animal shelters and pasture cropping, farmer-managed natural regeneration, integrated pest management, precision nutrient management and various soil and water management techniques that minimize the loss of soil structure and biodiversity and its capacity to recycle nutrients, store water and carbon, and be more cautious to minimize mechanical, chemical and biological activities that can damage long-term soil health and produce negative offsite effects. When adopted at the scale of a land or sea scape, regenerative practices are a foundation towards ecological resilience.

### c. What was/were the source(s) from which this solution emerged?

Regenerative agriculture has emerged from a long history of indigenous knowledge and management practices. Over time, many of these practices were replaced by new technologies which focused on optimizing short term productivity and profits. This solution recognizes the need to integrate old and new ways of producing food, focusing on reconciling the need for highly productive, nutritious and environmentally sustainable food production. This specific solution has been nominated by several food dialogues and members of the drafting committee including ICRAF, CIAT, OP2B and TNC.

### d. What problem is it trying to address within food systems?

The sources of agricultural and food system productivity has indeed allowed us to feed more people; however, these gains come with an expense we now starting to more fully account for. Food systems already cover 50% of the earth's habitable land and they are the primary threat to further biodiversity and habitat loss threatening 80% of mammal and bird species classified as close to extinction by the IUCN. Food systems contribute 25% of current greenhouse gas emissions and current practices have led to 52% of agricultural lands being moderately to severely degraded. Food systems use 70% of freshwater withdrawals annually and contribute significantly to water pollution with nutrients and sediments. Most wild catch fisheries are



overharvested or are at their current maximum production despite growing demand for seafood. With the global population continuing to grow, it is expected we will need to increase food production by 50% by 2050 to meet growing demand. The global food system has lost significant functional agrobiodiversity, with just 9 agricultural crops supplying nutrients for 66% of global food production, putting the food system at great risk for climate shocks. Yet, we need the food system to be transformed to be a net solution provider on these issues. Simply reducing the rate of extraction or degradation does not provide the operating leverage needed on issues such as climate change or biodiversity loss. Research has demonstrated the potential to regenerate natural capital through intensive food production practices. Despite growing scientific evidence of these risks, senior level management and decision-maker attention and prioritization of scaling up solutions through the food system remains low. Therefore, the central problem is how to scale up these solutions at a pace relevant to planetary challenges.

**e. Why is addressing that problem important for achieving the goal of your ACAI?**

As documented by the Food and Land Use Coalition (FOLU) report in 2019, the scale and diversity of global food production offers both an enormous challenge and a promising opportunity. Under the business as usual scenario, food production systems continue on their current trajectory, expanding by 400 million hectares and becoming a largest net source of greenhouse gas emissions. Yet, there is \$4.5 trillion of economic opportunity available to food system actors through 2030 by implementing solutions that lead to better outcomes. Dietary choices and demand signals are central to this solution. Often, both male and female farmers are willing to make decisions to diversify their cropping systems; however, they lack available markets and marred by restrictive policies. National policies governing both supply and demand often reinforce economic models of financial comparative advantage without taking a full accounting of ecological or human health impacts. Therefore, the opportunity is to more quickly integrate and scale-up projects focusing on regenerative management practices adopted in unique and context specific land or sea scapes as the necessary evidence to inspire broader changes.

**f. How can this solution address the problem?**

A range of management practices which rebuild soil health, sequester atmospheric carbon dioxide, protect habitat from conversion to agriculture and integrate more agrobiodiversity in food production are well understood, but are not widely adopted. The central problem our solution addresses is one of scale and pace of transition to regenerative food systems given the environmental pressures of climate change and biodiversity loss. A second problem our solution addresses is recognizing and respecting the unique diversity and cultural aspects food production represents. A third problem our solution addresses is the economic importance and livelihoods component of food production for a growing population. While there is certainly more to learn about regenerative management practices, what is known presently can make a major impact on our central problem.

What is proposed is to build a coalition of strategic partners who will invest together in building a network of Regenerative Food Scapes -- living laboratories of food production situated in diverse, representative land and sea scapes demonstrating the transformative environmental, economic and social impacts of regenerative production. Foodscapes become a collective action agenda which contemplates the unique biophysical, policy, market and cultural considerations of a food production geography. Regenerative solutions will be prioritized for investment and scaling with the support of a diverse group of enrolled actors, starting with gender-differentiated farmers, ranchers or fishing communities. Building peer-to-peer (farmer-to-farmer) learning networks at the Foodscape level is an essential part of addressing the full range of cultural, operational and financial decisions which are necessary to work through. Gender aware policy action must be identified and jointly developed to support an optimal transition. New business models involving new input bundles or offtake markets together with financing solutions are key. Unique gender based impact assessment data can be shared across the network of global foodscapes and partner organizations. Particular attention will be paid to sharing data with strategic investors and governments in order to accelerate adoption outside of the initial foodscape investment areas.



While it is important to start implementing this action agenda in a group of initial foodscapes immediately, it will be important to sponsor a strong gendered action research agenda to ensure the rapid dissemination of knowledge. Likewise, it will be important to create an open and accessible network supportive of the positive contributions of all actors across the global food system. It will be important to have a diverse and representative set of food production land and seascapes with formal recognition of member-states at the outset.

**g. Why does this solution align to the definition and criteria for a ‘game changing solution’ developed by the Summit?**

Food systems are vast, spread across the world’s managed land, marine and freshwater environments and accounting for more than 10% of global GDP. Food systems are governed by the independent actions of one billion farmers, ranchers and fishermen and 7.5 billion consumers. Yet, we must catalyze much quicker changes to a regenerative food system in some manner. With approximately 500 million smallholder farmers operating in about 75% of the world’s agricultural land and producing about 70% of food globally, the potential adoption and impact of regenerative agriculture practices is enormous. Many of these practices are low-cost with most of the investments going into the establishment phase, diminishing in subsequent years as soils build up and are coming back healthier. Many of these practices are also nothing new: for example, agroforestry has been practiced for millennia, and no-till has been used as far back as 10,000 years ago. Member-states committed to the achieving the SDGs and other development goals are strategically positioned to provide the necessary environment and investments to flourish regenerative agriculture at scale. While we now witness many member states setting their own targets against international commitments, investments are only gradually aligning to achieve them. Not all will be at same pace, so progress will be staggered and incremental. This will/can be accelerated by the private business sector’s shift to ‘regenerative’ practices in their land-based operations in pursuit of long-term business sustainability and compliance to national and international triple-bottom line standards and voluntary guidelines.

**h. What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?**

The world is not lacking in examples of successful regenerative practices adopted by farmers and grazers, backed-up by scientific analysis and promoted by scientists and advocates world-wide:

- Agave-based agroforestry system in the semi-arid drylands of Mexico. This agave-powered agroforestry and livestock management system is demonstrating that native plants, long overlooked, have the potential to regenerate drylands, provide large amounts of inexpensive but essential forage for grazing animals, and alleviate rural poverty. Agave plants and nitrogen-fixing trees, densely intercropped and cultivated together require little or no irrigation to thrive, and are impervious to rising global temperatures and drought. Agaves alone can draw down and store above ground the dry weight equivalent of 30 to 60 tons of CO<sub>2</sub> per hectare (12-24 Ct/acre/year).
- Communities Regreen the Sahel Programme. The program is active in over 200+ communities in Niger, Burkina Faso and Senegal, particularly in arid and semi-arid areas of the Sudano-Sahelian landscape. Farmers are practicing farmer-managed natural regeneration along with other agroecological practices to restore production and ecological functions of degraded drylands.
- There are a growing number of farmers and ranchers adopting regenerative agriculture practices such as no-tillage, cover cropping, intercropping, rotational cropping and intensive rotational grazing in the United States. Some of these farmers and ranchers are entering programs which will provide soil carbon payments which are provided as part of Scope 3 emission reduction strategies by agri-food sector companies.
- There are also examples of restorative aquaculture and utilizing fisheries data with training to improve coastal or freshwater fisheries that provide examples of regenerative seafood systems.



- New private sector coalitions such as OP2B are developing new models to engage with and supportive regenerative management practices at the landscape level. This offers the potential to provide new business models and financing for new ecosystem service markets as an additional component of a regenerative food economy.

**i. What is the current and/or likely political support for this idea?**

The United Nations Sustainable Development Goals and other international frameworks and agreements provide impetus for regional-national-local actions toward regenerative agriculture. In Europe, there is growing interest in a number of countries, within the scope of the “Farm to Fork” biodiversity strategy, and agriculture policies, and an increasing awareness of healthy foods and wellness growing among consumers and producers in North America. Some countries in the south like India and Nepal have national agroforestry policies that guide investments and programming, while others have enacted organic farming laws. Coalitions, alliances and networks of knowledge brokers and advocates are also growing across the globe: Regeneration International, Regen-Ag, Kiss the Ground, Aranya Agricultural Initiatives, Grounded, Rodale Institute, Savory network, Soil Capital, Soils Food and Healthy Communities, Soil Food-web Institute, Sustainable Harvest International, Terra Genesis International, Carbon Underground, Ecological Farming Association, Land Institute, Timbuktu Collective, Traditional Farmers Association, Global Evergreening Alliance, The Nature Conservancy.

**j. Are there certain contexts for which this solution is particularly well suited, or, conversely, contexts for which it is not well-suited at all?**

Regenerative agriculture has no boundaries: it is applicable and can work across land and seascapes in different agro-eco-climatic regions, from drylands to the humid tropics and temperate zones. Regenerative foodscapes can pick up on new levels of integration and optimization between land and marine environments. The beauty of regenerative agriculture is its wide adaptability across wide socio-ecological contexts because it embodies a universal and broad philosophy and principles of caring for the land on which, food and the survival of mankind depends. Geographically, it works across countries and regions with varying political economies and food systems indicators because regenerative practices are wide-ranging, and can be modified to suit local contexts. However, it should be noted that progress may differ across economies and societies as there are site-specific requirements under consideration. In conflict-laden societies, regenerative agriculture may not be the first and primary action to be taken, but it will be an important element of post-conflict recovery.

**k. Who are the key stakeholders to be further involved in the process of developing and refining the solution idea?**

A wide range of stakeholders, including women, youth and marginalized communities, must be engaged to ensure buy-in and successful deployment and scaling up of regenerative agriculture practices: (i) member states, regional and continental bodies (African Union, Intergovernmental Authority for Development-Horn of Africa, NEPAD, ASEAN, SARDEC, European Commission etc); (ii) conservation agriculture organizations such as IUCN, WWF, and The Nature Conservancy, who is coordinating a platform of stakeholders on a science agenda with IIASA and SystemIQ to further document the concept of Regenerative Foodscapes; (iii) global land investors in agriculture, food and chemical fertilizers (Del Monte, Sucden, Mars, Unilever, Syngenta etc); (iv) multi-stakeholder platforms such as “One Planet Business for Biodiversity” (OP2B) which comprised 27 large organizations working under the sponsorship of the French Presidency to address the scaling of Regenerative Agriculture; (v) youth and farmers organizations e.g., World Farmer Organization; and (vi) the OneCGIAR with its new Research for Development Research Strategy is committing to investigate and support systemic solutions for agricultural and food systems that tackle nutritional, environmental, poverty reduction, social inclusion and climate change goals. Regenerative agriculture options aligns to this multi-objective approach.



## 9. Scaling-out Agroecological Production Systems

### a. Background

The promotion of Agroecology follows suit to the formal recommendations made by the Committee of World Food Security (CFS) and its High Level Panel of Expert (HLPE) report to foster Agroecology as an actionable and sustainable approach for contributing to a Food System transformation that enhances food security and nutrition. The editors of this write-up represent an interdisciplinary group from various constituencies. Through this solution, we aim to address the inherent complexity of food systems, whose transformation require a comprehensive and systemic approach.

### b. Summary of proposed solution

The proposed "solution" offers a powerful approach that systemically considers different elements of food systems from production to consumption and involves all stakeholders (women, men, youth, marginalized and indigenous communities) and sectors. The concept of Agroecology does not present a narrow defined silver bullet solution but should be understood as a framework, building on core ecological principles that can be translated into a range of practices and systemic changes to be applied in a context-specific manner. FAO identifies [10 Elements of Agroecology](#) that guide policy makers, practitioners and stakeholders in operationalizing agroecological transitions.

Agroecology is a scientific discipline and a recognized social movement that nowadays is underpinned by a considerable evidence base for various production contexts. The HLPE report on [Agroecological and other innovative approaches](#), and the [FAO Agroecology Hub](#) are considered common denominators for the definition and framework of Agroecology. The proposed approach mimics natural ecological systems' principles for resilient and healthy food production while addressing systemic challenges such as, depletion of soils and natural resources, biodiversity loss, pollution and climate change. It is not limited to the production side but can be linked to other FSS Actions tracks (e.g. AT 5) to avoid silo approaches. It also aims to address social challenges such as inequality and power imbalances. Finally, Agroecology as solution aims at boosting family farmers, food producers and consumer agency rather than treating them merely as beneficiaries.

### c. Agroecology theory of change

Building on the ecological cornerstones of healthy and fertile soils, diversity, redundancy and closing ecological cycles to increase nutrient and resource use efficiency as well as fostering natural regulation processes, Agroecology is mimicking natural ecosystems. Farming and forestry practices based on Agroecology that favor carbon storage in soils and biomass contribute to preserving natural resources and biodiversity. Beyond these biological core elements for food production, it also provides principles for key socio-economic and governance aspects in the food system (see picture below).

Agroecology is put into action in many places already, but often on rather small scale. The following key actions can boost adoption and the sustainable scale-out of this solution:

- Provide both women and men farmers with [improved access to knowledge about Agroecology](#) principles and practices via extension services, peer learning and transition mechanisms such as insurances or micro-credits.
- [Redirect significant funding to](#) Agroecology research and to the development programs that are backed by governmental and institutional support.
- [Build and foster solid value chains and access to local markets](#) for Agroecology-based products while distortions such as subsidies for unsustainable practices need to be abandoned.



## 5 LEVELS OF FOOD SYSTEM CHANGE AND 10+ ELEMENTS OF AGROECOLOGY



As a result of these actions, the expected short to medium-term changes are the strengthening of resilient food production with environmental benefits such as soil fertility improvement and biodiversity regeneration, the establishment of sustainable local markets and social benefits such as increased resilience of livelihoods through diversification and reduced economic dependencies. The agents of change will be women, men and young farmers and family farmer organizations that know their needs and production environment best. Furthermore, research institutes, governmental ministries, development agencies, as well as the private sector will play a crucial role in the transition process by shifting to new regulation and business models to ultimately also change consumer's behavior. In the long-term, these changes can then contribute to the transformation towards equitable and sustainable food systems.

The out-scale potential of Agroecology is based on the assumption that its principles and knowledge are increasingly recognized, disseminated and consequently implemented by a broad range of producers. Risks could be that male and female farmers might face gender-differentiated production challenges in the transition phase to agroecological production. Finally, the conventional farming sector will need to adapt its business model when adopting this solution.

### d. Why does this solution align to the definition and criteria for a 'game changing solution' developed by the Summit?

The Agroecology approach is matching well with the FSS solution criteria. First, the proposed solution possesses a huge scaling-out potential in any context among small and mid-size farmers, who constitute the backbone of food systems. If applied widely the impact potential will have transformative character. Furthermore, Agroecology has shown to be economically viable and [proves a solid return on investment](#). Second, Agroecology is a bottom-up approach and therefore very actionable: it is embedded in farmer communities and often requires low cost measures. Through its holistic approach, Agroecology can foster capacities of women, men and young farmers related to resilience, gender equality, as well as create opportunities for rural youth and provide livelihoods and health benefits for them. To trigger this capacity will require support via training, insurances or micro credits. Finally, there is solid evidence that the systemic approach of Agroecology considerably [contributes to the SDGs and fosters synergies](#) among them.



**e. What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?**

Agroecology is employed all over the world to various degrees and consequently there is a growing number of empirical and narrative evidence from field pilots, comprehensive programs and even national policies. Inspiring examples can be found e.g. in the IPES report [The added value of Agroecology](#), the Beacons of Hope report, on the [Agroecology Infopool](#) and helpful guidelines are provided by the HLPE report on [Agroecology and other innovative approaches](#). The broad range of scientific articles can be browsed via the [FAO Agroecology Hub](#).

**f. What is the current and/or likely political support for this idea?**

There is growing support for Agroecology from different actors: The Farm to Fork Strategy of the EU Green Deal points to a better balance of nature, food systems and biodiversity. On a country level, governments such as Senegal, Togo, Mexico, India, Bhutan and France and several others actively proclaim the need for scaling up Agroecology. In the international arena, committees and working groups reporting to UN agencies such as the “friends of Agroecology” group and the “scaling-up Agroecology” initiative by the FAO, or the Committee of World Food Security (CFS) develop and endorse policy recommendations for the implementation of agroecological approaches. Research institutions like ICRAF, INRA, Coventry University and many others run comprehensive research programs. Finally, local initiatives such as [ZBNF](#) or [TIFS](#) increasingly focus on creating new concepts of crop production and livestock management, building sustainable markets and scaling up Agroecology.

**g. Are there certain contexts for which this solution is particularly well suited, or, conversely, contexts for which it is not well-suited at all?**

One major benefit of Agroecology is its context-specificity. It builds on available resources and capacities and can be applied to almost any food production environment. Consequently, agroecological principles are suited to fit into both small-scale farming systems in the Global South and the transformation of conventional agricultural systems in Europe. Despite its versatility, agroecological practices are particularly opportune in drylands and warm regions where resources are fragile or scarce. As Agroecology is also knowledge intensive, it requires a political environment that gives agency to family farmers and food producers and features strong democratic structures.

**h. Who are the key stakeholders to be further involved in the process of developing and refining the solution idea?**

Many stakeholders around the world are already working towards the support of scaling-up Agroecology. The international agencies and research institutes mentioned above played a key role in defining the concepts and principles in Agroecology. Civil society organizations in the Civil Society Mechanism, and the Via Campesina movement have been crucial to the implementation of agroecological practices in the field. However, given its comprehensive approach, there is a broad range of key stakeholders that still need to be further involved in the process of developing and refining the solution idea. Foremost, additional country governments could learn from current Agroecology country champions, e.g. via joining the [Food Policy Forum for Change](#) or the “4 per 1000” Initiative. Furthermore, actors from the investment side such as development agencies, impact investors and banks could engage more in the topic by learning from champions like BNP Paribas that boosted the ZBNF programme in India. In addition, national and international research institutes that focus on rather conventional farming approaches should be more engaged in fostering Agroecology related research. Finally, private sector actors have the potential to catalyze the out-scaling of Agroecology, but they are currently low in numbers. Accelerator approaches could be replicated from champion actors that successfully have integrated Agroecology principles in their business models. For all this, a broad range of actors from all types of constituencies and foremost family farmers and their associations could provide guidance and support for the questions and needs that the above mentioned actors might have.





## 10. Increasing agrobiodiversity for improved production and resilience

### a. Background information

Agrobiodiversity is an essential component for sustainable food systems. These plants and animals, together with the associated knowledge, are the foundation of food and nutrition security as well as livelihoods for families and communities around the world, specifically for 500 Million smallholder farmers around the world. They are so important because, since their domestication, they have changed to remain adapted to changing climate conditions, new pests and diseases and different cultural and taste preferences of the communities that adopted a given crop. Human migration in different agroecologies, economic exchanges and wars offered additional opportunities of different crops and animals to evolve. Through a combination of natural and human selection we have an incredible heritage of agrobiodiversity at crop and genetic levels. In traditional farming systems, women and men farmers used to keep many types of different crops and livestock as a way to manage biotic and abiotic risks and changing market demands.

International, regional, and national genebanks and other agro biodiversity conservation initiatives, in national and international settings, were established to maintain the genetic diversity not only of the crops and livestock that were originally domesticated in surrounding areas, but also of other foods that have become important to the breeders, farmers, and citizens they serve. While genebanks and similar initiatives have largely succeeded in developing the technologies needed to adequately safeguard part of the food biodiversity, it does not address the loss from production systems. Moreover, conservation of food biodiversity in such repositories is not practical for all crop and livestock species and their wild relatives, and as such ex situ conservation has only a limited potential to safeguard large part of neglected and underutilized species, trees important for nutrition and animals. In addition, ex situ conservation does not allow the continued evolution of these organisms and their associated cultural knowledge in their natural and agricultural habitats. Finally, the agrobiodiversity conserved in ex situ facilities cannot contribute to improve resilience, food and nutrition security of production systems.

### b. What, in brief, is the solution?

The solution will tackle the 4 dimensions: the knowledge gap, the incentives for use agrobiodiversity in production systems, the policy necessary to enable more diverse systems and the required financial investment and incentives mechanisms. Actions need to be taken to:

- Recognize and celebrate the diversity of cultivated food crops and domesticated animals and their related wild relatives, of associated food knowledge, and of the myriad cuisines formed from this diversity. Much more information is needed for many species on their potential to contribute to one of the major crisis highlighted above. This will include productivity, nutrition, resistance to biotic and a-biotic stresses.
- Use of what remains of the world's heritage of food diversity in farmers' fields when they are contribute to enhance food and nutrition security and conserve in conservation facilities those that may be important for future generations:
- Ensure an enabling environment that provides incentives to access and sustainably use agrobiodiversity in production systems; and
- Develop a green investment plan in support of new business models and economic systems that enhance profitability of more biodiverse production systems to change food production, markets, and consumer preferences such that food systems enable both men and women farmers to gain a viable livelihood through the use of agrobiodiversity.

Crosscutting is the need to create awareness on the importance of agrobiodiversity for improving nutrition and health and reduce the carbon footprint of agriculture. In addition, we foresee innovative finance to



conserve agrobiodiversity for future generations. The sub-set of potential solutions contemplated in this document are:

- Develop innovative finance mechanisms to ensure buy-in from the financial sector, food processing and seed corporations and foundations, civil society and men and women involved in the long-term conservation of agrobiodiversity. Potential instruments to be evaluated are green bonds, concessional loans, crop-based fundraising and crowd sourcing campaigns.
- Scale up the existing communication campaigns and tools to ensure adequate understanding and advocacy from a non-scientific audience in topics related to agrobiodiversity conservation and use, specifically farmers and consumers.
- Modernize the existing framework for distribution and access and benefit sharing of agrobiodiversity to ensure greater accessibility of the collections by gender differentiated end users and smallholder farmers and create a more important positive impact in the livelihoods of them all.
- Implement a strategy for conservation, improvement, use and consumption of Neglected and Under-Utilized Species (NUS), including women-led schemes to increase purchasing power by growing, household consumption and marketing of indigenous/under-utilised/neglected nutritious crops (\*proposed by Action Track 1).
- Increase the gender-sensitive funding for the characterization and sequencing of the world's priority collections of food diversity to better understand the intrinsic value of species and varieties and their contribution to resilience, biotic and abiotic stresses resistance/tolerance, livelihood, nutrition.
- Strengthen the programmes around agrobiodiversity use in marginal ecosystems with significant food security problems, such as the desert or drought-vulnerable areas.

**c. What was/were the source(s) from which this solution emerged?**

This game-changing solution is inspired by the Sustainable Development Goals, namely [Target 2.5](#). A precursor of this solution in the communications space is the [Food Forever](#) campaign, launched by the [Crop Trust](#), FAO and the governments of Germany, Netherlands, Norway and Switzerland in 2017 and which will finalize in mid-2021. For the particular case of food crops, an important basis for the conservation angle lies in the Crop Trust's [crop conservation strategies](#) and the key collections identified by FAO's [International Plant Treaty](#). In the livestock sector, the main resources can be found in the [Global Agenda for Sustainable Livestock](#) (GASL), a high level group hosted also by FAO. The solution also takes inspiration in the CBD Framework, namely [Aichi Target 13](#) and the One Planet, One Health approach. Finally, the seeds for needs program, implemented by the Alliance in 15 countries around the world and other agrobiodiversity initiatives related to NUS and use of genetic diversity to manage biotic and abiotic stresses represents a good example to operationalize the implementation of the proposed solutions

**d. What problem is it trying to address within food systems?**

Agrobiodiversity is threatened by unsustainable production systems. Agricultural production and markets tend to become more uniform, leading to an erosion of diversity from production systems. Traditional knowledge about the husbandry and use of diverse foods is in turn disappearing. And the ongoing efforts to conserve food biodiversity have not succeeded in fully stemming the tide of these losses. Such loss of agrobiodiversity has significant impact on the resilience of production systems, their outputs, in terms of food and nutrition security, the quality of the environment in terms of land degradation and provision of ecosystem services. Out of the major crisis that we are facing, the climate change, the triple burden of malnutrition, land degradation and biodiversity loss, agrobiodiversity can be an important component of the solution.

**e. Why is addressing that problem important for achieving the goal of your ACAI?**

The long-term conservation and availability of food diversity is crucial to ensure the long-term resilience of the food system, especially amidst the increasing climate variability, growing population and significant land



degradation. Agrobiodiversity provides options to breeders and farmers in the future to ensure the sustainability of their livelihoods and to supply consumers with nutritious, delicious food, forever. However, the entire incentive system is not conducive to greater use of agrobiodiversity in production systems, hence the need to deeply transform those incentive system to achieve the goal. Eventually, this will improve biodiversity by reducing the use of external inputs in production systems and creating a better environment for insects and birds among others.

**f. How can this solution address that problem?**

A bigger ownership from a broader range of stakeholders in food diversity conservation and use initiatives will ensure sufficient funding to protect this resource, as well as sufficient exposure to ensure political buy-in for improvements in the regulatory framework for access and benefit sharing.

Actors that need to be involved in this solution, besides this Working Group, include:

- Research centres, including hosts of international key collections (such as the CGIAR), as well as national centres working to support agrobiodiversity. This sector already has high stakes in the solution and therefore sufficient buy in. This group needs to improve its distribution of the collection to better impact on smallholder farmers and ensure more agrobiodiversity is injected in production system. In addition, they need to close the knowledge gap by characterizing better the collection they have to identify desired traits that would improve e.g. resilience and nutrition.
- Regulatory framework agencies, including the International Plant Treaty and the CBD. Outreach and engagement activities should be done at the Secretariat and country-level. It will be important to ensure the seed laws and laws to implement major treaties such as ITPGRFA, CBD and Nagoya protocol are implemented in ways that will incentives greater use of agrobiodiversity
- The indigenous groups and smallholder farmers as custodians of an important part of the world's food diversity as well as its associated traditional knowledge. Some groups including those behind in situ conservation projects like the Parque de la Papa in Peru are already strongly involved with these topics and aligned with this solution proposal. They will be the user of agrobiodiversity and will be part of the research agenda aiming at closing the knowledge gap.
- The financial sector, which already has shown an initial interest in raising catalyst funds for global common goods (see the case of the HSBC and Clarence House-led project, Terra Carta). The financial sector will be crucial in the design of instruments to catalyse greater, sustainable funding in the long run. This will be in line with green and circular economy and support the establishment of SMEs in local communities that will generate income and jobs for women and youth.
- The food processing and seed sectors, given that they have the foremost influence in ensuring the diversification of food through product development, as well as the optimization of the value chains. Certain networks of companies have already shown interest in these topics, namely the One Planet Business for Biodiversity ([OP2B](#)). There is a need to transform markets from uniformity to diversity.
- The main actors behind ensuring a greater awareness of the importance of agrobiodiversity, include the media and the civil society. A particular strength in this regard lies in **the convening and communicational power of chefs**, which have strong ties with individuals (particularly in the developed world), which use agrobiodiversity on a daily basis and which are already associated in several networks such as the [Chefs' Manifesto](#).

In short, there is already significant buy in to the topics from different stakeholders, but a more consolidated strategy needs to be implemented to ensure the advocacy and support is adequately directed to tackle the main problems of insufficient funding for agrobiodiversity conservation and use activities, as well as the existing restrictions to provide access to farmers and breeders of the material hosted in the international system.



**g. Why does this solution align to the definition and criteria for a ‘game changing solution’ developed by the Summit?**

The solution is disruptive in several sense:

- It can significantly change the way we address the conservation of our food diversity and therefore leave a lasting impact in the way our food systems operate in the future. The solution is achievable, because the necessary resources are significantly lower than those required to cover other priorities within SDG2 (e.g. safeguarding all the world’s crop diversity only requires around US\$850-1,000 million). The solution impacts the work in other action tracks, including tackling food insecurity, promoting nature-based solutions, and supporting farmers’ livelihoods.
- It will transform production systems from monoculture to more greater sustainability through better use of agrobiodiversity. This will require significant changes in laws and policies to provide the necessary investment from public and private funds
- It will stimulate the development of local economies based on circular and green economy as well as on corporate social responsibilities. This will give opportunity for job employments for women and youth. This will also require public and private investment in support the creation of startups.
- Finally, it will have a positive impact on consumers who will have more choices for healthy food. This will require the willingness of food processors, distributors, retailers to accept more diversified food sources and shift in value chains.

**h. What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?**

Agrobiodiversity - the wealth of plants, animals and microorganisms used for food and agriculture<sup>22</sup> - plays a key role in the transition towards more sustainable and resilient food systems. There is a large amount of research and evidence suggesting that maintaining and increasing diversity in agricultural settings is key to boosting nature-positive production at scale.<sup>23</sup> In agricultural production, agrobiodiversity supports long-term productivity, and resilience, boosting yields in quality and quantity, increasing soil and water quality, contributing to pest and disease mitigation, and reducing the need for synthetic fertilizers.<sup>24 25</sup> Agricultural biodiversity also keeps open options for unknown future needs, if conserved in gene banks and on farms.<sup>26</sup> Agrobiodiversity is also the foundation of agroecology, which is recognized as a successful approach to shift towards more sustainable and resilient food systems. Not only it increases resource-use efficiency and minimize waste and pollution (through a virtuous cycle in which all the natural elements are both inputs and outputs of the production process), it also addresses the need for equitable food systems where people can choose what they eat and how it is produced.<sup>27 28</sup> Increasing the use of agrobiodiversity in production can mitigate agricultural risk and stabilize men and women farmers’ income. Broadening the type of cultivated

<sup>22</sup> FAO. 2004. “What is agrobiodiversity?”. Available at: <http://www.fao.org/tempref/docrep/fao/007/y5609e/y5609e00.pdf>

<sup>23</sup> Leclère, D., Obersteiner, M., Barrett, M. *et al.* Bending the curve of terrestrial biodiversity needs an integrated strategy. *Nature* 585, 551–556 (2020). <https://doi.org/10.1038/s41586-020-2705-y>

<sup>24</sup> Bioversity International, 2017. Mainstreaming Agrobiodiversity in Sustainable Food Systems: Scientific Foundations for an Agrobiodiversity Index. Bioversity International, Rome, Italy.

<sup>25</sup> Wood, Stephen & Baudron, Frédéric. (2018). Soil organic matter underlies crop nutritional quality and productivity in smallholder agriculture. *Agriculture Ecosystems & Environment*. 266. 100-108. 10.1016/j.agee.2018.07.025.

<sup>26</sup> Bioversity International, 2017. Mainstreaming Agrobiodiversity in Sustainable Food Systems: Scientific Foundations for an Agrobiodiversity Index. Bioversity International, Rome, Italy.

<sup>27</sup> Gliessman, Steve. (2016). Transforming food systems with agroecology. *Agroecology and Sustainable Food Systems*. 40. 187-189. 10.1080/21683565.2015.1130765.

<sup>28</sup> HLPE. 2019. Agroecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome.



plants and diversifying production reduces risks of losses due to climate change, pest and diseases. It also benefits the environment by increasing the abundance of pollinators and beneficial soil organisms.<sup>29</sup>

**i. What is the current and/or likely political support for this idea?**

The topic of agrobiodiversity is already being addressed within other Action Tracks, including AT1 (promotion of projects for NUS), AT3 (spearheaded by WWF and specifically tackled by one of the working groups focused on agrobiodiversity led by the Crop Trust and Bioversity), AT4 (mainly through the advocacy of IFAD), and AT5. Several governments with important leverage in the topics have already contributed significantly to activities of agrobiodiversity conservation and use. This include (but are not limited to) the US, most of Western Europe, South Korea, Japan, Australia and New Zealand. Most of the agrobiodiversity lies in collections in the developing world, which could ensure a multipolar support to the solution. This solution has been shared with the International Plant Treaty's Secretariat, one of the fundamental regulatory institutions working on these topics, with positive feedback. The private sector and financial sector have also shown initial interest as explained above, particularly through the OP2B network which is heavily involved in the Summit and which hosts most of the Forbes 500 food processing companies globally. Indigenous and farmers association show interests in this solution. Consumers in some parts of the world are aware of the importance of healthy food, there is a growing trend for eating healthier and more diverse, so a buy-in from a larger audience could be easily achievable provided the adequate outreach mechanisms are set in motion.

**j. Are there certain contexts for which this solution is particularly well suited, or, conversely, contexts for which it is not well-suited at all?**

There are a number of tools developed in the past few years that allow to monitor the progresses in food systems, some of which also consider agrobiodiversity. Among others, the Food System Dashboard, the Economist Intelligence Unit Global Food Security Index, the Alliance of Bioversity and CIAT Agrobiodiversity Index. None of them indicates any places where this solution is not suitable. However, if we use dietary deficiencies as an indicator for poor use of agrobiodiversity, it is more urgent to adopt this solution in the global south.

**k. Who are the key stakeholders to be further involved in the process of developing and refining the solution idea?**

Key stakeholders include national and international research system, international organizations (FAO, Global Crop Trust, ITPGRFA, CBD, IFAD, WFP), international NGOs (WWF, IUCN), National Government, private sector (seed companies, food processors, distributors, retailers), Action Track 1 and Action Track 4.

<sup>29</sup> Bioversity International, 2017. Mainstreaming Agrobiodiversity in Sustainable Food Systems: Scientific Foundations for an Agrobiodiversity Index. Bioversity International, Rome, Italy. Available at:

[https://www.bioversityinternational.org/fileadmin/user\\_upload/online\\_library/Mainstreaming\\_Agrobiodiversity/Mainstreaming\\_Agrobiodiversity\\_Sustainable\\_Food\\_Systems\\_WEB.pdf](https://www.bioversityinternational.org/fileadmin/user_upload/online_library/Mainstreaming_Agrobiodiversity/Mainstreaming_Agrobiodiversity_Sustainable_Food_Systems_WEB.pdf)



## 11. Sustain and Expand Sustainable Resilient Blue Food Production Systems

### a. What, in brief, is the solution?

National governments employ newly-created analytical tools to more accurately assess the nutritional and socio-cultural assets and utilities of blue foods<sup>30</sup> resulting in more pro-active usage policies and a greater allocation of resources in support of blue food systems with a smaller environmental footprint. The solution has two parts: 1) Development of a *national nutritional and livelihood assessment that accounts for the role of blue foods* in delivering protein and vital micronutrients to the population, both currently and into the future under climate change scenarios; and 2) Based on assessment results and identified priorities, *enact policy and funding decisions in support of effective fishery management and/or the launch of the 'next generation' of sustainable aquaculture*. This solution will support the achievement of a nation's aspirations through nutrition-sensitive policies that balance priorities including ecosystem function, livelihoods, food security, equity, and economic goals.

Climate change and overfishing [threatens fishery production](#). We can buffer climate-driven losses in seafood production under all but the most severe climate scenarios in most countries, and for some countries potentially increase production with less ecological damage *right now and into the future*<sup>31</sup>. Climate-resilient fishery management begins with implementing the six basic tenets of sustainable fishery management<sup>32</sup>, while incorporating forward-looking management targets, creating trans-boundary agreements for sustainable management of fish stocks, and building the systems resiliency. It is critical that equity considerations drive the process and outcomes of fisheries management to improve food and nutrition security. Healthier fish stocks and habitats create healthier ecosystems, food systems and fishing communities that are more [resilient to the impacts of climate change](#).

Aquaculture development has already greatly increased the supply of aquatic food; but the next decade calls for us to launch the next generation of sustainable aquaculture practices in order to re-direct production away from high-impact high-priced fed aquaculture species towards those with a smaller environmental footprint and sustainably meet current food-provisioning needs to keep up with growing demand for protein and micronutrients. Like wild fish and aquatic plants, cultivated species offer great promise for diversification of both diets and livelihoods, reducing the risk of increased malnutrition because of climate change. Aquaculture can also generate co-benefits in the form of ecosystem services especially from culture of extractive (filter-feeding) molluscs and algae. Investing in sustainable low-tropic and extractive aquaculture (including both animals and plants) and expanding sustainable fed aquaculture on land and in open ocean, are essential to new generation of resilient aquaculture operations. The key is to take this step-in harmony with coastal and riparian communities' needs, to complement and not displace wild caught fisheries.

### b. What was/were the source(s) from which this solution emerged?

This solution emerged from a collaborative process between ACAI members Environmental Defense Fund and Stockholm Resilience Centre, and in consultation with blue food experts who are documenting the nutrition, livelihood and food security [contributions](#) and potential areas for growth of blue foods including the [Blue Food Assessment](#), Duke University, Harvard University, the Nature Conservancy and World Wildlife Fund.

<sup>30</sup> Blue food, includes fish, aquatic plants, algae, and invertebrates from both marine and freshwater environments

<sup>31</sup> Free, et al (in press)

<sup>32</sup> Management targets and limits that take climate science into account; Adaptive, science-based catch or effort limits and other management measures; Strong and effective accountability and enforcement measures; Secure tenure and appropriate forms of co-management where stakeholders at different scales (e.g., local, regional, national) share decision-making and implementation responsibilities. This includes adherence to [Voluntary Guidelines for Securing Sustainable Small-scale Fisheries](#) and [Voluntary Guidelines on the Responsible Governance Tenure of land, Fisheries and Forest in the Context of National Food Security](#); Diversification of the species targeted and the "blue foods" that communities and countries depend upon; Transboundary fishery management agreements that allow for equitable food and nutrition provisioning considering climate-driven shifts



**c. What problem is it trying to address within food systems?**

Blue food adds an additional and much needed dimension to the increasingly crowded food landscape. It imperative it gets high priority when formulating the overall food system agenda. One out of every 5 people rely on fish as a source of essential micronutrients, such as zinc, vitamin A and fatty acids that is not easily replaced, and 3.3 billion people rely on fish for nearly 20% of their animal protein. Yet despite its [significant contribution to nutrition and food security](#), the blue food sector is generally seen as a 'natural resource' with emphasis placed on policies that maximize economic rents (or foreign exchange) and production, while contributions to food and nutrition security is underappreciated and undervalued. These valuable resources and the environments they depend on are at risk due to threats from climate change, unsustainable aquaculture growth and overfishing. Furthermore, there is no ready substitute for the nutritional niche occupied by blue foods so we must quickly recognize their value and take steps to secure and grow their contributions.

**d. Why is addressing that problem important for achieving the goal of your ACAI?**

Projections show that by 2050, about 4.5 billion people will rely on blue foods, especially fish. However with predicted declines in fish catch from overfishing over the next few decades, if we conduct business as usual, this will put 10% of the world's population at [risk of malnutrition](#). It is vital to manage this critical resource and ensure sustainable growth of the aquaculture sector. When designed and implemented properly, these blue food sectors can be a powerful means to address biodiversity loss while contributing to food and nutrition security, and building climate and disaster defenses – delivering triple bottom-line benefits in terms of nutrition, resilience to climate-induced shocks, and biodiversity.

**e. How can this solution address that problem?**

We've demonstrated that we can [reverse the decline in wild fisheries](#) and restore their abundance with good management. But we will experience a decline in the available protein and micronutrients unless we rapidly scale these successful governance and management tools. This is possible if we invest, proportionately to blue foods' value, in capacity-building tools and continue to refine and implement climate resilience adjustments to our management systems. Similarly, in aquaculture, exponential growth has resulted in more food, but also increased pollution, habitat destruction, disease spread, chemical use and high dependence on high input resources like soy and wild fish for feed. Solutions to these impacts are rapidly evolving and merit heightened regulatory attention and governmental resources. By recognizing and valuing how important blue foods currently contribute (and in many instances can grow their contribution) towards food and nutrition security, countries would strategically prioritize funding and make blue food-friendly policy decisions to support their maintenance and sustainable growth.

**f. Why does this solution align to the definition and criteria for a 'game changing solution' developed by the Summit?**

This solution is game changing as it meets all three criteria: impact at scale, actionable and sustainable. Investment in these systems can be a development tool to help support food and livelihood provisioning and economic development for small-scale producers, while minimizing and mitigating environmental degradation. We need to continue progress by increasing the scale of support and application, for ocean and freshwater systems, that can deliver on UN SDGs progress (including 2, 3, 13, 14) and support resilient coastal communities worldwide.

**g. What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?**



This solution is based on examples of success around the world, emerging scientific research, and innovative technological applications and [documented evidence](#) of chronic underinvestment in ocean and aquatic resources. [Ongoing research](#) is chronicling the inadequately measured contributions of small-scale producers and will add evidence about both nutritional and livelihood roles for wild fisheries. There is large and growing body of research demonstrating the [importance of blue foods](#) to current global food and nutrition security, and the opportunity to grow their contribution sustainably into the future under various climate scenarios in an environmentally sound way, if the right policies and investments are put in place.

**h. What is the current and/or likely political support for this idea?**

Interest in and support for better valorizing blue foods is reaching an inflection point. A recent paper urging that we '[Recognize fish as food in policy and development funding](#)' documents why the need for the shift is so timely, and why we need to improve metrics, promote nutrition-sensitive aquatic food systems, and more equitably manage the distribution of blue foods to maximize nutritional value and human health impact, and do all of this in the context of food systems as a whole. The [High Level Panel for a Sustainable Ocean Economy](#) has endorsed blue foods and FAO fisheries officials expressed strong support for taking 'fish as food' directly to those making food policy at their biennial meetings in February 2021. Political support outside of the somewhat narrow fisheries arena will depend upon how well the narrative of the potential for fish to feed the world is presented.

**i. Are there certain contexts for which this solution is particularly well suited, or, conversely, contexts for which it is not well-suited at all?**

Blue foods are part of the nutritional foodscape in both coastal and landlocked countries; marine and freshwater fish and aquaculture are highly varied. This solution has very broad applicability as systems can be designed and adapted to meet identified goals in many geographic contexts. Action and investment should be prioritized to support the communities most vulnerable to climate change and most dependent on blue foods for current and future food and nutrition security.

**j. Who are the key stakeholders to be further involved in the process of developing and refining the solution idea?**

Key stakeholders include: men and women fisherfolk and aquatic farmers along with policy makers, scientists, civil society, and the commercial fishing and aquaculture industries. The seafood industry includes large-scale actors and corporations and small-scale fishing vessels and fishing communities. Both groups (large- and small-scale) have recently moved to increase their political engagement and policy capacity for purposes of supporting and implementing sustainable practices.



## 12. Aligning policies with nature-positive production

### a. What, in brief, is the solution?

Mainstreaming nature-positive production calls for a systemic re-evaluation of the drivers of current food system performance. Coherently aligning agricultural and other relevant policies with sustainable food system goals (tbd) is one of the most powerful levers for food systems transformation. Given the complexities of food systems this involves scrutinizing and aligning a large set of policies, spanning from agriculture to trade to finance to R&D to name a few. Alignment with sustainable food system goals is also required across regional, national and sub-national levels. A consistent set of policies should aim to reflect the true cost of food and set incentives for nature-positive production practices, constraints and disincentives for nature-negative production practices and support the scaling of transformative agroecological systems. Such process of policy realignment for the food system transformation requires coordination and accountability at all levels, from inter-ministerial coordination and accountability to transparent participatory multi-stakeholder processes such as food policy councils that also address power imbalances in the food system.

### b. What was/were the source(s) from which this solution emerged?

The solution, or variants of it, has been proposed by several Advisory Team members as well as in the public consultation. Policy reform providing consistent incentives for the food system transformation is recognized as a key lever by many organizations including UNEP, CFS, FOLU, IPES-Food, WBCSD, EAT Forum, Global Alliance on the Future of Food.

### c. What problem is it trying to address within food systems?

Most policies that influence food systems are based on an outdated paradigm focusing on maximizing single crop yields and cheap calories, at the cost of many unwanted social, health and environmental outcomes. Such policies perpetuate unsustainable systems by rewarding investments and business models that do not account for the true cost of food and overlook the benefits of nature positive practices. Producers' agency to change their production model is often hampered by the lack of appropriate market infrastructure, including for the provision of financial services. Consistent sustainable policies should incentivize (new) market mechanisms that include environmental and social externalities in order to balance the playing field on which truly sustainable actors are currently systemically disadvantaged. The exemption of agricultural emissions from carbon accounting rules, where those exist, is a case in point. To protect food security and male and female farmer's livelihoods, a major source of emissions goes unregulated while the transition to a system that punishes emissions but rewards farmers for their environmental services, including soil carbon, would restore the long-term productivity of their land and support their livelihoods.

### d. Why is addressing that problem important for achieving the goal of your ACAI?

The proposed policy reforms are imperative overarching game changers to support the transition to and the rapid adoption of nature-positive production systems and practices. While individual solutions might be transformative, they might not be sufficient to ignite a transformation at scale. Together, the proposed solutions need a coherent and re-enforcing set of policy incentives to ensure their sustainability and effectiveness in supporting the transformation of food production towards net positive practices and systems. Current policies lead to a predominance of production systems and practices that have massive negative environmental externalities including biodiversity loss, soil erosion, pollution, water depletion and climate change, but also social externalities like reduced human health, social inequalities and low farm incomes

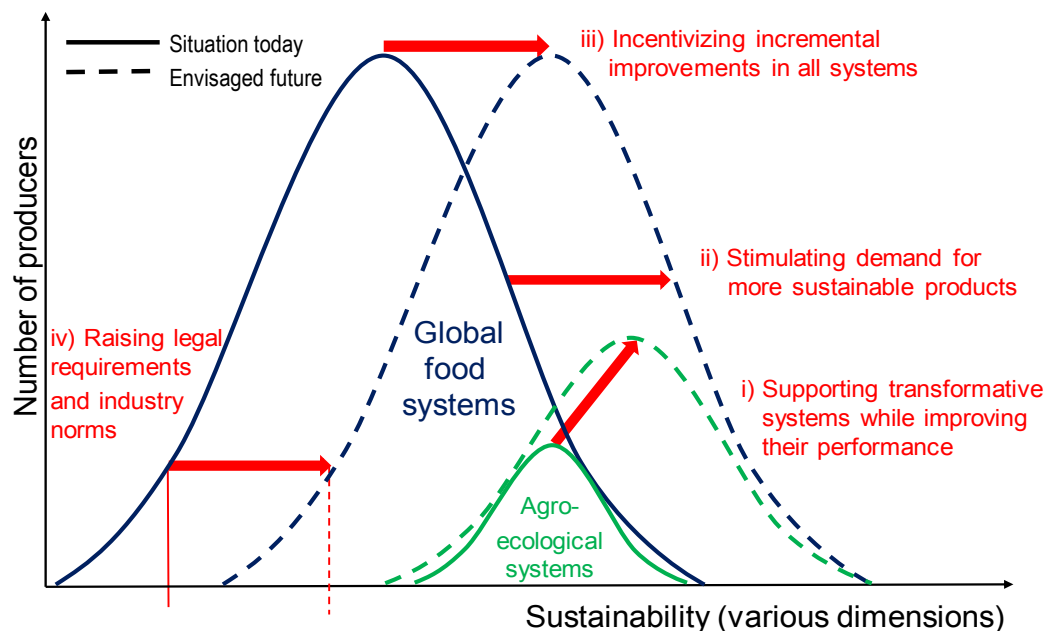
### e. How can this solution address that problem?

Analyzing the coherence of existing policies with sustainable food system goals (tbd) and their internal consistency across different sectoral policies would ideally take place in a multi-stakeholder setting involving



the concerned ministries or departments to ensure legitimacy (agriculture, environment, finance, health, rural development etc.). This can happen at international, regional, national, sub-national and municipality level. Mechanisms like food councils need to be put in place to foster greater accountability and transparency, similar to the Climate Cabinet in Germany (though it does not include agriculture). Similar processes already exist at the international level for example in the UN voluntary reporting on the Sustainable Development Goals, or the WTO's regular Committee on Agriculture. Policy makers can benefit from exchanging with peers from other geographies, from tools that help to manage systemic complexity and from technical guidance on how the required reforms can be put in place and how to overcome lock-ins and resistance. These efforts will help identifying the need for policy reform and developing coherent transition strategies with timeframes that allow food producers and other food system stakeholders to adjust their production systems.

At output level, this process will lead to revised and new strategies, policies, regulations and action plans related to food production within sustainable food systems. Four important groups of policy interventions can synergistically transition our food system to a more sustainable one: (i) specifically supporting transformative agroecological systems through a combination of push, pull and enabling measures, while improving their performance; (ii) stimulating the pull-effect of an increasing market demand for sustainable and affordable products (see FSS Action Track 2); (iii) incentivizing incremental improvements in mainstream agriculture and food systems with regard to combined sustainability objectives (e.g. through redirecting subsidies and adjusting taxes); and (iv) raising legal requirements and industry norms in order to rule out particularly unsustainable practices. Other policies, beyond those part of this “nature positive production” set of interventions (such as for example trade policy) would need to be aligned with the objective of sustainable food systems.



Eyhorn, F., Muller, A., Reganold, J.P., Frison, E., Herren, H.R., Luttikholt, L., Mueller, A., Sanders, J., Scialabba, N., Seufert, V., Smith, P.  
Sustainability of global agriculture driven by organic farming. *Nature Sustainability* 2 (2019) 253–255.

At outcome level, such policy reforms will lead to gradual adjustment of costs and prizes to increasingly reflect better the true cost of food (internalization of externalities), upscaling of investments in nature-positive production, adjustment of business models and behavior change of food system actors. The impact will be twofold: 1) a gradual shift of mainstream production systems towards sustainability (“sustainable intensification”) and 2) up-scaling of transformative agroecological systems. Both will lead to more positive and less negative externalities of food production.



**f. Why does this solution align to the definition and criteria for a ‘game changing solution’ developed by the Summit?**

The proposed solution has an enormous scale potential since it covers entire countries / jurisdictions. Various countries, federal states and municipalities have already shown that – provided that there is political will - it is actionable and impactful and can even result in a reduction of overall societal costs. Such profound and ambitious policy reform is likely to last also when governments and politicians change. As policies influence all aspects of food systems such reform will have positive effects on equitable livelihoods (see FSS Action Track 4), health and regenerating environmental integrity, while providing income opportunities particularly for rural youth and women. They are mutually reinforcing all other game-changing solutions since they provide the enabling environment for them to thrive.

**g. What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?**

Policy reform following the proposed approach to a greater or lesser extent is already happening in some countries, states, counties and municipalities. Examples include France, UK, Denmark, Andhra Pradesh and Sikkim (Indian States), San Francisco (Good food purchase program), Kenya (fertilizer subsidy policy), Senegal (policies to foster agroecology), agroecology-based policies in Latin America (Argentina, Brazil, Chile, Costa Rica, Cuba, El Salvador, Mexico, Nicaragua), and the development of regional policy road maps at the state level in Columbia (FOLU platform). Submissions to FAO’s Agroecology Lex database, the [Future Policy Award of the World Future Council](#) and the “Beacons of Hope” of the Global Alliance for the Future of Food and Biovision indicate that an increasing number of countries are engaging in food policy reform. Some of these examples already show impressive results.

**h. What is the current and/or likely political support for this idea?**

Many institutions recognize the need for policy reform to transform food systems, particularly with regard to production (including UNEP, CFS, FAO, IPES-Food, FOLU, Global Alliance on the Future of Food). Several governments are supporting international efforts to address food policy reform (including Sweden, France, Denmark, Germany, Switzerland ...). Germany, Switzerland and the FAO are supporting a peer-to-peer exchange among policy makers on revising food system policies, involving a growing community of countries (see [Food Policy Forum for Change](#)). At municipality level, the Asian Local Governments for Organic Agriculture ([ALGOA](#)) is already involving >200 municipalities supporting and promoting sustainable organic agriculture in their public offices, schools, public markets and of course with the farmers in the territories.

The FOLU Coalition, through its country platforms (in China, Colombia, Ethiopia, India and Indonesia) engages in multi-stakeholder processes at the national or the sub-national level to define policy road-maps towards sustainable, inclusive and health-supporting food systems. Similarly, the FABLE network develops sustainability pathways for the food and land use systems in 20 countries to guide policy development. The Just Rural Transition initiative is another example of a multi-stakeholder “community of practice” of actors – including XY governments, gender-inclusive farmers organisations, food companies, investors, researchers and civil society – committed to food system transformation. Its Policy Action Coalition (PAC) to Repurpose and Reinvest Public Support for Food and Agriculture is comprised of committed country members, knowledge and implementation partners. However, there is also fierce opposition from those who see their current business model and vested interests at risk (see [IPES-Food report](#)). The ongoing debates and farmer protests related to agricultural policy reform e.g. in India, France and the UK show the need for just transition strategies with time frames that allow producers to adjust to the new “rules of the game”.

**i. Are there certain contexts for which this solution is particularly well suited, or, conversely, contexts for which it is not well-suited at all?**

The solution works globally at regional, national, sub-national and municipality level. However, policies need to be highly adjusted to the territorial context and are substantially different for industrialized countries, low-



income countries and politically fragile contexts. Such contextualization of policies is possible even under current WTO regulations.

**j. Who are the key stakeholders to be further involved in the process of developing and refining the solution idea?**

Link with AT3 ACAI “Restore” (subsidies), AT 1 (investments) and possibly other ATs that have come up with policy-related game-changing solutions (exchange has already started). There are possible tension fields on access and affordability (AT 1 and AT 2). Involve the FSS Scientific Group, the [FABLE Consortium](#), CFS, WBCSD and policy makers (through the [Food Policy Forum for Change](#)) to further develop the solution.

## **References**

10YFP 2020: Outcome Document of the 3rd Global Conference of the One Planet network's (10YFP) Sustainable Food Systems (SFS) Programme: Achieving the SDGs through food systems transformation. On the road to the Food Systems Summit 2021. <https://www.oneplanetnetwork.org>

Ajates Gonzalez, Raquel, Jessica Thomas, and Marina Chang. "Translating agroecology into policy: The case of France and the United Kingdom." *Sustainability* 10, no. 8 (2018): 2930.

de Molina Navarro, M. González. "Agroecology and politics: On the importance of public policies in Europe." In *Law and Agroecology*, pp. 395-410. Springer, Berlin, Heidelberg, 2015.

Eyhorn, F., Muller, A., Reganold, J.P., Frison, E., Herren, H.R., Luttikholt, L., Mueller, A., Sanders, J., Scialabba, N., Seufert, V., Smith, P. Sustainability of global agriculture driven by organic farming. *Nature Sustainability* 2 (2019) 253–255.

HLPE Policy recommendations on Agroecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition. CFS 2020.

IFOAM Organics international, World Future Council, FAO 2018 Scaling up agroecology – Future Policy Award 2018. <https://www.worldfuturecouncil.org/wp-content/uploads/2018/10/FPA-2018-Brochure-for-web.pdf>

Petersen, Paulo F., and Luciano M. Silveira. "Agroecology, public policies and labor-driven intensification: Alternative development trajectories in the Brazilian semi-arid region." *Sustainability* 9, no. 4 (2017): 535.

Sabourin, Eric, Jean-François Le Coq, Sandrine Fréguin-Gresh, Jacques Marzin, Muriel Bonin, Maria Mercedes Patrouilleau, Luis L. Vázquez, and Paulo Niederle. "Public policies to support agroecology in Latin America and the Caribbean." *Perspective* 45 (2018): 1-4.

WTO Agriculture Symposium (2020) Agricultural Trade and Food System Transformation Symposium [https://www.wto.org/english/res\\_e/reser\\_e/agricsymp2020\\_e.htm](https://www.wto.org/english/res_e/reser_e/agricsymp2020_e.htm)



## 13. Reducing on-farm and post-harvest food loss

### 1.1. Please provide the name of your solution.

Investing \$1 trillion to reduce global food loss of high-impact commodities by 2025

### 1.2 What problem is your solution addressing?

Reducing food losses is essential for reducing climate impact of food supply, impacts of land use changes, and realizing food and nutrition security. High-emission supply chains such as beef, dairy, and rice contribute at least 70% of agricultural greenhouse gas emissions (GHG) globally; losses in agricultural production and first stages of the value chain for these categories represent about 400 Mton CO<sub>2</sub>-eq. GHG emissions annually. Interventions can substantially reduce losses (e.g. FAO estimates that 475 million tons of lost food could be saved through refrigeration alone) and consequently improve the diets of millions from existing food production. However, (smallholder) farmers cannot realize these solutions themselves, substantial investments globally will be required.

### 1.3. How does your solution address the problem?

The aim of producing critical global commodities (both perishable and non-perishable) should be to produce increasing and regenerative yields, while also reducing carbon emissions, farm inputs and freshwater withdrawals. *Meeting these goals will require the reduction of on-farm and post-harvest losses*; this requires a multi-faceted approach including:

- *Establishing evidences (monitoring, identification of drivers and solutions) that convince value chain parties and governments and supporting organisations (sustainability gain, nutrition security) to co-create and implement solutions;*
- *Establishing supporting multi-billion-dollar global investment mechanisms to improve cold chains, farm mechanization and technology, knowledge, and loss reduction solutions;*
- *Scaling pilot projects that have already proven to increase food security while mitigating climate change.*

As an example, working with 700 smallholder rice producers in a first pilot project scalable to at least 32800 smallholder rice farmers in Nigeria, Wageningen Food and Biobased Research (WFBR) supported Olam Group to assess effectiveness of mechanization. Using WFBR's tool [ACE-calculator](#) to select the most prosperous interventions, annual impacts were:

- Loss Reduction of 920 kg of rice per farmer
- Increased income 338 US\$ per farmer
- 3 tCO<sub>2</sub>-eq greenhouse gas emissions per farm

These types of measurement and solution interventions, will have an incredible impact on not only environmental outcomes, but also on livelihoods and global food security goals.

### 1.4. Is this a new solution or an existing solution that needs scaling?

Existing solution in need of scaling

### 1.5. Which organization/s, institution/s or group of individuals are associated with the solution? (Please include a link to the organizations website if available)

WWF, World Bank, Rabobank, WFBR, Olam Group, IFPRI, WUR, CIAT, CGIAR-CCAFS, FAO, UNEP



**1.6. If selected as a game-changing solution, how will you leverage the UN Food Systems Summit to scale your solution?**

The UN Food Systems Summit will provide a platform to showcase the urgency for consistent supply chain data collection, transparency and scaling of food loss solutions. In addition, it will showcase the urgency for investment mechanisms to fund needed interventions in key geographies. Billions of dollars of technical assistance and solution investments will be needed to implement food loss and cold chain solutions. The UN Summit could provide a critical convening where that financial planning can occur.

**2.1. Is this idea applicable to a particular geography, demography, landscape or other type of setting (e.g. high- or low-income countries, aquaculture)? If so, please specify.**

This idea is global and will be adapted for use in regional contexts.

**2.2. Who are the main actors that would put this action into place?**

Policymakers (government) , Farmers/fisheries, UN agencies , Private sector, Investors



## 14. Broadening the genetic base of nature-positive production systems

### a. What, in brief, is the solution?

The relatively narrow genetic base underpinning many of today's agri-food systems makes them vulnerable to climate change and limits dietary choices and livelihood opportunities of stakeholders. A rich source of crop biodiversity has been assembled at genebanks around the world during the last half-century. This resource has yet to be systematically deployed at scale to broaden the genetic base of agri-food systems for reasons such as (1) the scarcity of information available for many genebank accessions, (2) a perhaps too exclusive focus on genetic-improvement programs as the principal genebank users, and (3) inadequate tools for effective two-way communication between genebanks and their clients. We propose to rethink and broaden the role of genebanks by reaching out to technology innovators to enrich collections with more actionable information and engaging with a broader range of genetic value chain actors through digital-networking tools to better understand and address their needs. Over time, this should lead to a more systematic testing of crop genetic resources by a broader range of actors to broaden the genetic base of nature-positive production systems.

### b. What was/were the source(s) from which this solution emerged?

The idea to encourage a broader use of crop genetic resources for food production has led to the decision by the Alliance of Bioversity Intl. and CIAT to build Future Seeds, a 21<sup>st</sup>-century genetic-resources hub for tropical food systems based in Colombia.

### c. What problem is it trying to address within food systems?

The vulnerability of agri-food systems to climate change; the need to maintain/increase per-ha yield to respect planetary boundaries; the urgency to promote more diverse and nutrient-dense diets better aligned with human physiology; and the pressing need to create more income opportunities for disadvantaged agricultural communities.

### d. Why is addressing that problem important for achieving the goal of your ACAI?

The genetic base of crops substantially determines the flexibility, adaptability and robustness of agricultural production systems when it comes to meeting challenges such as climate change or diet-related chronic diseases.

### e. How can this solution address that problem?

Crop biodiversity can be used in a variety of ways, including (1) a more effective deployment of genetic diversity in the improvement of 'mainstream crops', (2) 'off-the-shelf' deployment of traditional varieties or landraces with desirable traits, (3) diversification across a broader range of currently underutilized or neglected crops, and (4) fast-tracking the domestication of new crops. All four of these impact pathways (IP) critically depend on information about features of crop genetic resources, such as the presence of desirable traits like disease resistance or heat tolerance (IP 1, 2, 3), traditional knowledge about uses and traits (IP 1, 2, 3), and the genetic makeup and relationships among germplasm materials (IP 1, 4). The *de novo* domestication of novel crops based on knowledge about the molecular events that led to the domestication of traditional crops (IP 4) has only recently become a possibility (Tassel et al. 2020). To this date, IP 1 has probably been the dominant impact pathway for many crops, particularly those with long breeding histories.

A common denominator (and current bottleneck) of all four impact pathways is the limited availability of actionable information linked to genetic resources. Technology advances in the areas of DNA-sequencing, image-based phenotyping, robotics and machine learning offer opportunities for characterizing genetic resources at an accelerating pace and decreasing cost. On the other hand, COVID-19 has accelerated a trend towards digital social networking, which is empowering people to assemble virtually to promote common interests. Although agricultural citizen-science tools such as ClimMob already provide platforms for



somewhat related crowdsourcing purposes (Van Etten et al. 2019), Decentralized Autonomous Organizations (DAOs) which are governed via tokens on public blockchains owned by community members, may emerge as a particular powerful organizational model for men, women and young farmers and other genetic-value-chain actors to gather and promote agreed-up research priorities or policy measures.

Genebanks, sometimes considered as mere ‘seed warehouses’, should stay abreast of these developments. They should proactively attract technology innovators to better characterize their collections and use digital communication channels and platforms to more effectively reach out to emerging networks of germplasm users such as farmer organizations, breeders, seed companies, nutritionists, ‘foodies’, etc. In this way, genebanks such as the new Future Seeds genetic-resources hub in Colombia, which was explicitly designed to support a broader deployment of genetic resources, could more effectively identify and make available genetic resources that address the needs of a broad variety of germplasm users, thereby becoming a driving force to ‘bio-diversify’ production systems.

**f. Why does this solution align to the definition and criteria for a ‘game changing solution’ developed by the Summit?**

New funding would be required for genebanks to better characterize germplasm collections and to more proactively engage with germplasm-user networks through novel digital social networking tools and platforms. Genebanks are situated in the upstream part of genetic value chains. The potential multiplier effect on downstream actors, therefore, could be substantial, and comparatively small investments could create large returns, albeit not immediately. Over time, the funding required is likely to decrease as per-unit costs for characterizing genebank accessions are bound to decrease as technologies advance.

**g. What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?**

There are numerous examples demonstrating the use of crop genetic resources to improve mainstream crops (Bailey-Serres et al. 2010), to identify ‘off-the-shelf’ landraces that outperform mainstream varieties (Mancini et al. 2017), and to diversify cropping systems, for example by incorporating cash crops (Feliciano 2019). Also, proof-of-concept work has demonstrated the feasibility of fast-tracking *de novo* domestication of new crops using gene-editing (Tassel et al. 2020).

**h. What is the current and/or likely political support for this idea?**

Several genebanks have started characterizing their collections at greater depth, both on a genetic and phenotypic level. However, the role of genetic data or Digital Sequence Information (DSI) in the context of Access and Benefit Sharing (ABS) is subject of intense discussions between the Global South and North (Hiemstra et al. 2019) and could potentially derail efforts to expand the ‘digital dimension’ of crop genetic resources to encourage their broader use in agri-food systems.

**i. Are there certain contexts for which this solution is particularly well suited, or, conversely, contexts for which it is not well-suited at all?**

Marginal and more heterogeneous agroecosystems may require more context-specific, non-standard crop germplasm and may benefit most from a broader range of genetic options to test and choose from.

**j. Who are the key stakeholders to be further involved in the process of developing and refining the solution idea?**

International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), CGIAR Genebank Platform, CGIAR Big Data in Agriculture Platform, Seeds 4 Needs project, World Farmers’ Organisation, Crop-specific seed system networks such as PABRA, SeedSystem.org

## **References**





## 15. \$200M Climate Smart Food Systems Impact Investment Fund

### a. Background

The global food system will need to produce food more efficiently and sustainably to feed an increasing population with changing diets, achieve the Sustainable Development Goals (SDGs) and meet the 2°C climate commitments of the Paris Agreement. As climate change affects food systems, governments, food and agriculture companies, and public and private investors need to better identify and address the numerous climate and nature-related risks they face. This can be an inflection point to seize the new investment opportunities that the transformation to nature-positive, low-carbon and climate resilient food systems presents. This will require addressing core market failures to unlocking private sector financing from food and agriculture companies, domestic and international financial institutions, and specialized investors. Against this backdrop, the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) and its partners conducted an extensive research, analysis, and stakeholder consultation with more than 100 partners globally to identify key action areas that are fundamental to transform food systems under a changing climate. These four action areas represent the basis of the systemic transformation that is needed in food systems: (i) rerouting farming and rural livelihoods to new trajectories, (ii) de-risking livelihoods, farms and value chains, (iii) reducing emissions from diets and value chains, and (iv) realigning policies, finance, support to social movements and innovation to build more resilient and sustainable food systems.

The game changing solution proposed under this submission emanates from the fourth action area as it proposes to reorient and leverage large volumes of private capital towards innovative investments in Climate-smart Food Systems. This will be done through the establishment of the first science-based USD200M climate smart food systems impact investment fund to help address key challenges and bottlenecks of the global food system. The fund will provide long-term expansion debt financing to SMEs operating in Asia Pacific, Latin America and Africa with enormous potential to transform food systems in these regions and positively contribute to climate change mitigation and adaptation and nature in food systems. It is critical to note the extraordinary scale and impact potential this game changer has, as it doesn't rely solely on public funding to get it off the ground. It is instead an innovative investment solution that will mobilize USD200Mio in commercial capital and will serve as a proof of concept to showcase how a private-public partnership can help transform food systems to become low-carbon and climate resilient in a commercially and financially attractive manner, while also delivering robust science-based development impact (i.e. nature positive, improved climate adaptation and mitigation, nutrition and diets, etc.). This will serve to guide other private investors on how to effectively finance the transformation of food systems.

### b. What, in brief, is the solution?

responsAbility Investments AG and CGIAR/CCAFS aim to launch a USD 200 million impact investment fund to help address key challenges of the global food system. The fund will provide long-term expansion debt financing to SMEs operating in Asia Pacific, Latin America and Africa and thereby positively contribute to nature, climate change mitigation and adaptation in food systems. The rationale of the fund reflects two major global concerns: first, by 2050, global food production needs to feed two billion people more in the context of a depleting natural resource base. Second, the food system represents about a third of global greenhouse gas emissions. To match the need for an increase in food production with the Paris Agreement, it is critical to support the transition to nature-positive, low-carbon and climate-resilient global food systems. The Fund will support climate-smart interventions, such as sustainable land use, reduced food loss, energy and water efficiency, use of renewable energy and a shift to healthier and more nutritious and sustainable diets that can help deliver a large part of the net zero emissions goal targeted by mid-century.

### c. What was/were the source(s) from which this solution emerged?

The idea for this solution emerges from the *Actions to Transform Food Systems Under Climate Change* report, produced with input from over 100 organizations. Specifically, CCAFS team conducted a consultation with



more than 40 global leading public and private investors to identify key bottlenecks and potential solutions to transform food systems under a changing climate. The idea has since been further developed by the CCAFS program, which is led by the Alliance for Bioversity International and CIAT, and responsibility Investments AG, which submitted the idea through the Public survey.

**d. What problem is it trying to address within food systems?**

Linking to the Actions to Transform Food Systems Under Climate Change report action 4.2, this solution seeks to unlock private capital at scale (USD200Mio) to provide long-term expansion debt to SMEs operating in Asia Pacific, Latin America and Africa. The rationale of the fund reflects two major global concerns: first, by 2050, global food production needs to feed two billion people more in the context of a depleting natural resource base. Second, the food system represents about a third of global greenhouse gas emissions. To match the need for an increase in food production with the Paris Agreement, it is critical to support the transition to nature-positive, low-carbon and climate-resilient global food systems. The Fund will support climate-smart interventions, such as sustainable land use, reduced food loss, energy and water efficiency, use of renewable energy and a shift to healthier and more nutritious and sustainable diets that can help deliver a large part of the net zero emissions goal targeted by mid-century.

**e. Why is addressing that problem important for achieving the goal of your ACAI?**

The annual SDG financing gap is estimated at US\$2.5trillion, while the capital needed to transform food and land systems is estimated at US\$300 and US\$350billion per year. However, the volume of ODA flowing to food, agriculture and fishing in 2018, for example, amounted to US\$10.2billion. It is clear that public funding alone will not be sufficient to finance such transformation. This financing gap is even more critical when considering that our global population is likely to increase by another 2 billion by 2050, with changing diets, while the climate crisis exacerbates, and our natural resource base depletes at an alarming rate. Hence, we also need to design and deploy innovative investment solutions that can reorient and leverage private capital at scale to finance the much-needed technical innovations required. This solution will have a transformational impact, as it will not only use science to support the transformation of food systems to the benefit of people, nature and climate, but also showcase robust science-based commercially viable models that can help attract significantly more private capital at global scale.

**f. How can this solution address that problem?**

This solution aims to leverage and deploy private capital to implement climate-smart interventions to address key challenges of the global food systems through a USD200M impact investment fund. This will require i) exceptional investment capabilities, including the know-how on long-term expansion debt financing, ii) cutting-edge scientific capabilities for climate smart investments planning and decision-making during pre/post phases of technical assistance, and iii) projects/companies with ambition to tackle challenges of nature and climate change and increased demand for food. Having these inputs, will allow the Fund to make strategic investment decisions across the food systems actors and provide pre/post-technical assistance, including assessing the entry points for investments that address negative externalities and inefficiencies, as well as developing integrated climate risks management strategies.

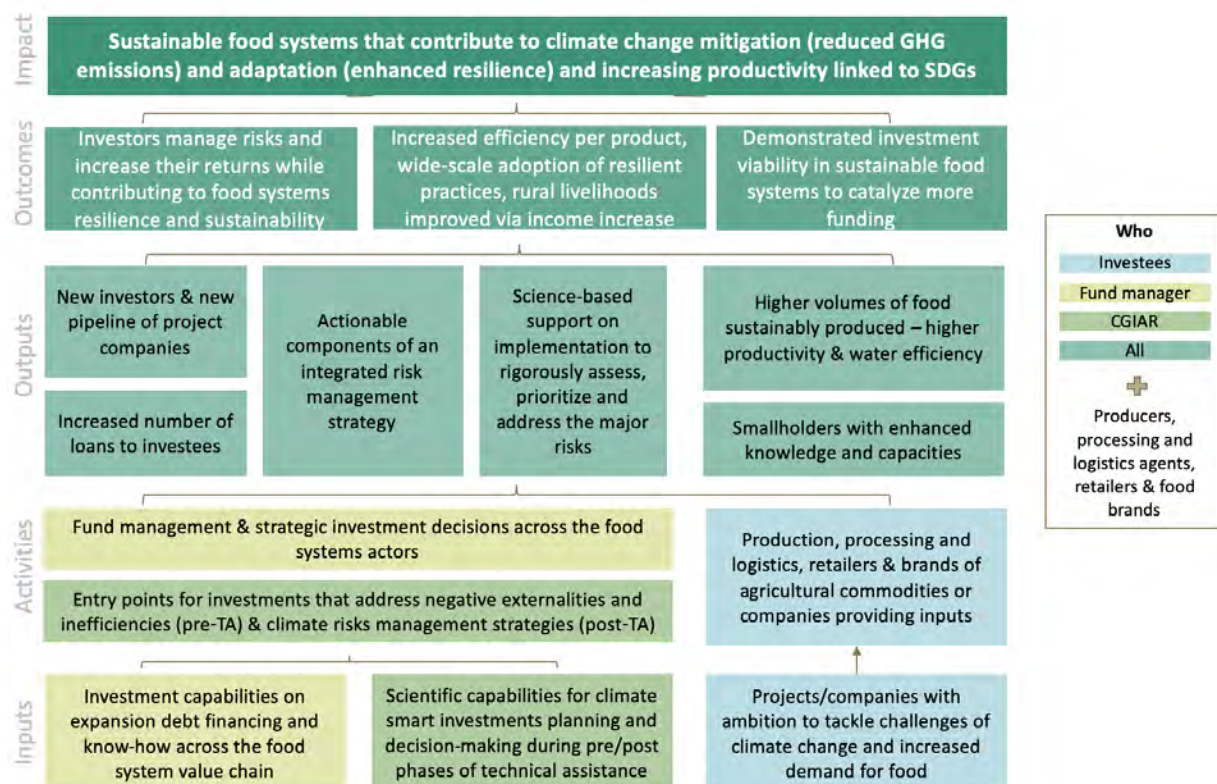
By doing so, the fund will be able to attract new investors, create a pipeline of project companies, and increase the number of loans to investees. Finance and technical support will go towards scalable SMEs that can accelerate the transition to lower-carbon intensity and climate-resilient food systems in developing and emerging countries, by developing business models supporting sustainable land use, reduced food loss and waste, energy and water efficiency, use of renewable energy, and shift to sustainable diets etc. Moreover, as this is a science-based fund, actionable components of an integrated risk management strategy will be developed through tailored research. The implementation will be also informed by science to rigorously assess and prioritize the major risks. Additional outputs include higher volumes of food sustainably produced with higher productivity and water efficiency, and more agri-food SMEs with enhanced knowledge and capacities, which are ultimate goal of our game changing solution.



Three major outcomes will be achieved through the implementation of the Fund. First, through tailored technical assistance, investors will have the capacity to manage risks and increase their returns while contributing to food systems resilience and sustainability, that is, enhanced adaptation, GHG emissions reduction and increased productivity. Second, our solution will enable agri-food SMEs to increase agricultural efficiency per product, while facilitating a wide-scale adoption of climate-smart strategies and increasing smallholders' incomes to improve rural livelihoods. Third outcome is demonstrating the investment viability of climate smart business models by showcasing a pipeline of 30+ SMEs at various stages of development that support interventions needed to transform the food system.

Ultimately, our game changing solution will realign investments to support sustainable food systems that contribute to climate change mitigation (reduced GHG emissions) and adaptation (enhanced resilience) while improving productivity. These impacts will directly contribute to SDGs 13, 2, 1, 12 and indirectly to SDGs 8, 15, 10, 7 and 9. Science-based monitoring and evaluation tools will enable the Fund to track contribution to key SDG indicators.

Major assumptions include; the existing growth and demand for healthy and ethical food in developed and developing markets, as well as the increased willpower of both public and private sectors to increase their ambition and short-term actions to tackle climate crisis while recovering from sanitary crisis. Increased dynamism across private sector agri-food industries to act against global climate challenges affecting food supply and demand, thus food systems as a whole. Moreover, as the Fund relies on high quality and blue-sky research on food systems and climate change including crosscutting institutional, socioeconomic and gender dimensions, we do not foresee potential unintended consequences of enacting this solution.



- g. Why does this solution align to the definition and criteria for a 'game changing solution' developed by the Summit?



The Fund will be the first truly "science-based" climate smart food system fund, designed with scientific rigor from the onset to i) effectively assess and integrate climate change, biodiversity and related considerations in the investment decision-making process; ii) ensure the long-term sustainability of investees (women and men SMEs and gender-differentiated farmers they invest in); and iii) maximize the SDG impact of their investments:

- **Impact potential at scale:** In this changing environment, long-term capital is paramount to support SMEs not only to address the challenges faced by COVID-19, but also to build more resilient food systems that can endure future shocks. The fund will support a pipeline of growing SMEs actively transforming the food system. The success will attract not only further capital but will also incentivize Agri-Food SMEs to incorporate sustainability and climate change into their businesses and operations, and to adopt climate smart practices and technologies that contribute to the transformation to a low-carbon and climate resilient food system. Furthermore, this will serve as a real-life proof of concept to showcase how food systems transformation can be achieved at global scale, and how we can mobilize large volumes of much needed private capital to finance such transformation especially considering the annual investment gap to transform our food systems is estimated at US\$ 300-350 billion.
- **Sustainability:** The fund will use a science-based approach to deliver robust social and environmental impact while also targeting positive financial returns for investors, demonstrating the commercial viability of the investment. Women and men SMEs and farmers on the ground benefit from access to the latest CGIAR research innovations, knowledge and technologies to help them improve their productivity and livelihoods, and better adapt to and mitigate climate change. Unlike conventional impact funds, which tend to focus on one or several stages of the value chain (i.e. primary production, processing. etc.), this Fund will identify entry points for investments that address negative externalities and inefficiencies of the entire food system, from pre-production, through production and supply chains, to consumption.
- **Actionability:** The proposed solution is highly actionable as the proponents have been working with responsAbility AG to do the groundwork for the fund design as well as identify investors. The fund is now investor ready, and can be launched at the Summit as a scalable solution, which can attract even greater investment in years to come. The Fund aims to showcase to impact investors, and specifically more traditional private investors, that meaningful and transformational impact can be achieved (beyond the much less rigorous conventional ESG impact), if the necessary financial and scientific resources are put in place. The fund will prove that harnessing science and innovation can reorient and leverage private finance flows towards innovative investments in sustainable food systems transformation.

**h. What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?**

The Fund combines the investment capabilities of one of the world's largest impact investors in sustainable food with the research capabilities from the world's largest agriculture science and innovation network. The fund deployment projections are derived from triangulating several factors, including experience of the asset manager disbursing over USD 1.7 billion in structured loans to agricultural value chain players. In particular, the fund is expected to leverage the experience of asset manager in long-term loans in the agriculture and food sector (Approx. USD100m, showing average annual losses of <1%).

The technical assistance required of the Fund is rooted in CGIAR's scientific and research capabilities, assets, people and global presence. With +8000 scientists and researches across 70+ countries, CGIAR possess unparalleled access to cutting-edge research on climate-smart food systems. Examples of the research and scientific innovation capabilities that comprise the technical assistance requested so far (and delivered by CCAFS scientists) include: development of agriculture criteria for green bond issuance, development of investment strategy for impact investment funds, climate risk assessment, detailed value chain analysis with a focus on improving food and nutrition security, identification of high-impact investment opportunities (deal sourcing and origination), identification of climate smart agriculture practices and technologies, development



of ESG and impact frameworks, impact monitoring and evaluation, carbon accounting analysis, etc. The Fund currently has over 250 SMEs in the pipeline and 25 in active engagement.

**i. What is the current and/or likely political support for this idea?**

This idea was discussed in a large consultation with a wide range of member states, and Germany (through GIZ/BMZ) extended financial support for the design of the Fund. Since then, a number of Governments have expressed their political support for the Fund, as well as financial contributions to the technical assistance facility, that as part of the Fund, which will provide science-based advisory services to the SMEs that will receive investments from the Fund.

**j. Are there certain contexts for which this solution is particularly well suited, or, conversely, contexts for which it is not well-suited at all?**

The Fund will target developing and emerging countries, as food systems in those countries are more fragile and require more technical and financial support to drive a transformation that benefits people, climate and nature. Likewise, these countries and their gender-differentiated farmers are experiencing the adverse effects of nature loss and the climate crisis more severely, and at the same time represent an enormous potential to help make their food systems more climate resilient and low-carbon.

The innovation of this approach is that there are no contexts for which this solution is not well suited, as the novelty is the use of science and professional private investment management capabilities that can be specifically tailored to each context/location.

**k. Who are the key stakeholders to be further involved in the process of developing and refining the solution idea?**

Corporates, private and institutional asset owners, philanthropies, other aligned private co-investors and member states that are interested in investing in demand-based scientific innovation that can help leverage private capital at scale for food systems transformation, while delivering robust and science-based development impact for people, planet and nature.



## F. Solutions from ACAI Restore

### 16. Addressing ‘invisible’ underwater issues for food systems: The “blue food” revolution

#### 2.1 What, in brief, is the solution?

To maximise the potential benefits of “blue foods<sup>33</sup>” to address malnutrition and hunger globally, and rebalance the distribution of aquatic resources, there needs to be a re-focus by leaders at all levels. That re-focus should incorporate blue foods into broader food-systems policy beyond production to consider efficiencies, equity, affordability, socio-cultural well being and consumption, climate resilience and embed under-represented groups in decision-making.

The solution is focused on designing aquatic food systems (freshwater and marine) to be equitable and inclusive, with efficiencies that minimise waste and loss (e.g. by-catch, fish-farm outputs, supply chain losses) and cost sustainable and responsible resource management into food products. This can include:

- i. Equitable access and benefits, e.g. inclusion of under-represented groups, labour practices that eliminate slavery/under payment.
- ii. Costing social equity and sustainable management into aquatic food products [true cost option to pay] via supply chain verification (helping to eliminate IUU) and costing the full life-cycle of production (e.g. packaging, transport, disposal).
- iii. Promoting diverse food systems that embrace a variety of fisher/fish-farmer groups, technologies and species, to provide greater nutrition where needed and utilize under-valued species.
- iv. Closing the loop – circular food production systems that are waste positive (e.g. use of suitable organic by-products as inputs to fish farming to be waste positive), or multi-trophic systems.
- v. Decentralised policy development that engages and empowers under-represented groups (such as small-scale actors (i.e. fishers and small-holder fish farmers), women, ethnic minorities) in decision-making and co-management, as agents in achieving sustainability, food security and improved nutrition.
- vi. Precision fishing – minimise bycatch, habitat impacts and carbon footprint via approaches such as fish distribution models (making sure that effort/output controls are in place to prevent overfishing), alternative gears, shortening supply chains and using forecasts of environmental conditions (e.g. maximise safety, minimize steaming time and lost gear during storms etc).
- vii. Market-driven fishing and aquaculture harvests – pre-sale of blue foods<sup>34</sup> – with minimal wastage and considering profitability of products. These producer-consumer partnerships can also serve other advantages (e.g. less packaging, faster delivery, less holding facilities using power) and support stability of small scale actors.
- viii. Climate resilient approach – include practices and management that adapt to changing species abundance and distributions, at all scales, including agreements negotiated between nations.

#### 2.2 What was/were the source(s) from which this solution emerged?

<sup>33</sup> Edible aquatic organisms, including fish, shellfish and algae from marine and freshwater production systems

<sup>34</sup> <http://digitaleditions.smedia.com.au/afr-todays-paper/shared/ShowArticle.aspx?doc=AFR%2F2021%2F03%2F09&entity=Ar02202&sk=F96F33CB&mode=text>



The solution builds on a number of international directives that focus on transformational change for aquatic fisheries and aquaculture (marine and freshwater) to maximise food and nutrition security as well as sustainability, and minimise environmental impacts. These include the Food and Agriculture Organization of the United Nations (FAO)<sup>35</sup>, the food system commitments of the FAO/WHO Second International Conference on Nutrition (ICN2) and the UN Decade of Action on Nutrition 2016 – 2025, the 2021 COFI declaration for Sustainable Fisheries and Aquaculture, and many global Sustainable Development Goals, including SDG 2: *Zero Hunger*, SDG 3: *Good Health and Wellbeing*, SDG 10: *Reduce inequalities*, SDG 12: *Responsible Consumption and Production*, and SDG 14: *Conserve and sustainably use the oceans, seas and marine resources for sustainable development*<sup>36</sup>.

In addition, a number of international and multi-disciplinary programs are focusing on the potential for blue foods to provide enhanced nutrition for malnourished people and support an ever growing human global population. The Blue Food Assessment<sup>37</sup> and Future Seas<sup>38</sup> collaboration are two such initiatives that have provided input to this solution. The Blue Food Assessment is a coalition of international researchers working to put “blue food” (food from marine and freshwater systems) in the center of the global food policy agenda. Future Seas aim, initially via a series of collaborative visioning papers, is to motivate international efforts to improve ocean health by providing the science necessary for sustainable development of the oceans, to underpin one of the tenets of the Decade of the Ocean, ‘*The ocean we need for the future we want*’.

Ultimately, the solution emerged through the ACAI Action Track 3 discussions, public surveys, scientific papers and alignment with international initiatives focusing on this issue.

### 2.3 What problem is it trying to address within food systems?

Increasing the production of food from aquatic systems is seen as a pathway toward more sustainable and nutritional human diets. Yet this potential is being overshadowed by competing uses of aquatic resources in an accelerating “blue economy” (Troell et al. 2014; Farmery et al. 2021<sup>39</sup>) and may require trade-offs between terrestrial food production and capture fisheries/aquaculture. While aquatic or blue foods have the potential to deliver future sustainable food systems that are highly nutritious<sup>40</sup>, blue food ‘growth’ must avoid the mistakes of land-based food production. These include over-intensification, inequities throughout the value chain, unnecessary waste and ‘captured’ markets. The current emphasis on production of food systems rather than efficiencies (e.g. waste reduction and recycling) and equitable distribution of benefits (as well as burdens), has created weak assumptions that growth and availability in the blue economy will lead to increasing blue food production, and thus improved food and nutrition security. If policy development for blue foods doesn’t acknowledge and address these issues, blue food contributions to reducing hunger and malnutrition, and to meeting the Sustainable Development Goals, will be sub-optimal.

The central challenge in managing common aquatic resources, such as fish, invertebrates and plants, rests in the divergence between the interests of individuals and the interests of the collective or commercial groups, generating incentives for the overexploitation of resources, inequitable access (particularly for under-represented groups such as women, Indigenous communities, ethnic minorities and the poor), and loss of rights and benefits as long value chains dilute distribution. To resolve such problems requires innovative,

<sup>35</sup> FAO (1995) Code of Conduct for Responsible Fisheries. Rome, Italy.

<sup>36</sup> FAO (2017) The 2030 Agenda and the SDGs: The challenge for aquaculture development and management, by John Hambrey. FAO Fisheries and Aquaculture Circular No. 1141, Rome, Italy.

<sup>37</sup> <https://www.bluefood.earth/about-the-bfa>

<sup>38</sup> <https://futureseas2030.org>

<sup>39</sup> Farmery, A.K., Allison, E.H., Andrew, N.L., Troell, M., Voyer, M., Campbell, B., Eriksson, H., Fabinyi, M., Song, A.M., Steenbergen, D. (2021) Blind spots in visions of a “blue economy” could undermine the ocean's contribution to eliminating hunger and malnutrition. *One Earth*, 4(1), 28-38.

<sup>40</sup> Rice, J. C., and Garcia, S. M. (2011) Fisheries, food security, climate change, and biodiversity: characteristics of the sector and perspectives on emerging issues. *ICES Journal of Marine Science*, doi:10.1093/icesjms/fsr041.



participatory and inclusive processes, and ultimately better alignment between individual interests and that of the wider development community. A number of barriers to sustainable aquatic food systems include:

- Difficulty in detecting changes in species, habitats and ecological communities due to largely 'invisible' complex interconnected underwater ecosystems, species mobility, and large areas.
- Disconnect between centralized policies focused on development and local needs focused on food security, small-scale livelihoods and good nutrition.
- Entrenched practices based on historic profit-driven (male-dominated) fishing, harvesting and fish-farming practices.
- Undervalued ecosystem goods and services where extracted or farmed aquatic products are not costed to include ecological degradation (or restoration).
- Under-representation of marginalized groups in decision-making and inequitable distribution of resources and benefits as well as exposure to harms, which is particularly problematic as 90% of fishers globally are artisanal, supporting food security and poverty alleviation.

Taking a broader food-system approach beyond production that also consider efficiencies, equity, affordability, and consumption will refocus the blue food agenda on making production and consumption more equitable and sustainable while increasing access and affordability for those who need it most.

#### **2.4 Why is addressing that problem important for achieving the goal of your ACAI?**

Action Track 3 aims to optimize environmental resource use in food production, processing and distribution, thereby reducing biodiversity loss, pollution, water use, soil degradation and greenhouse gas emissions. Marine habitat degradation is a critical factor in the decline of wild capture fisheries due to land-based pollution and development (e.g. removal of coastal nursery habitats), destructive fishing practices and also in terms of an expanding coastal aquaculture footprint (e.g. space and resources – feed, power, water). Incorporating habitat and stock condition, and restoration (the considers the uncertainty of climate change) into transformational changes that are adaptive and facilitate increased food production while minimizing impacts on ecosystems and biodiversity will deliver both food security and environmental benefits.

#### **2.5 How can this solution address that problem?**

The up-scaling of blue foods to meet the nutrition challenges of accelerated human population growth depends on being able to produce more with less and equitable distribution. More access to blue foods for vulnerable groups, greater nutritional value of blue foods, while producing less waste and fewer environmental impacts. This requires a paradigm shift that learns from the mistakes of long-established land-based agricultural food systems, where policy at the highest level needs to focus on transformational change that takes a broader food-system approach to rebalance the distribution of benefits, promotes and costs sustainable practices, and minimizes social and environmental impacts and harmful practices.

Importantly, the need to include and empower under-represented groups, such as small-scale fishers and fish farmers, women, traditional owners, Indigenous communities and the poor, in decision-making as agents in achieving sustainability, food security and poverty alleviation is critical to this solution. Empowering under-represented and marginalized groups by supporting equitable access to and opportunities in the fisheries and aquaculture sector can support decentralized and less industrialised food systems. As part of this solution, empowering under-represented groups needs to be supported by (1) adequate policy/governance frameworks, (2) funding mechanisms, and (3) monitoring and evaluation of efforts and commitment.

#### **2.6 Why does this solution align to the definition and criteria for a 'game changing solution' developed by the Summit?**



The UN Food Summit provides the opportunity to re-focus global leaders on transformational change that takes a broader food-system approach to rebalance the distribution of benefits, promotes and costs sustainable practices, and minimizes social and environmental impacts and harmful practices. Within the blue foods production system, it is small-scale fishers, including women and ethnic minorities, who feed the majority of communities vulnerable to malnutrition and hunger. This ‘game changing and systemic solution’ is feasible, based on evidence and best practice, and would shift the underlying globalization and industrialized structures that shape aquatic food systems. It can be scaled up globally, and has application across the entire aquatic food system and value chain.

## **2.7 What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?**

Many global programs have documented the significant inequalities within aquatic food systems, brought about by, for example, trade and climate change (FAO, 2021 COFI declaration for Sustainable Fisheries and Aquaculture, many global Sustainable Development Goals, The Blue Foods Assessment and Future Seas). These programs and initiatives have placed a spotlight on aquatic or blue foods and their connections with addressing malnutrition, hunger and links to terrestrial food systems in a way that wholistic food system decisions are needed. Consistently, the available evidence supports the need for equitable distribution of aquatic resources and benefits, engaging strongly with and empowering under-represented groups, and delivering whole life-cycle solutions that cost inputs as well as outputs, such as pollution and by-catch, into market value.

## **2.8 What is the current and/or likely political support for this idea?**

This solution is consistent with global SDGs 2, 3, 10, 12, 14, as well as the 2021 COFI declaration for Sustainable Fisheries and Aquaculture (<http://www.fao.org/3/ne472en/ne472en.pdf> ) includes the following:

*...Recognizing further that women [and marginalized groups] are critical to all Sustainable Development Goals, in particular as agents in achieving food security and improved nutrition in poor and vulnerable households, and the fisheries and aquaculture sector’s potential for growth in opportunities...*

Critically, many international initiatives are working towards this type of solution, and political acceptance will grow as they deliver additional knowledge and research to support the benefits of incorporating blue foods into broader food-systems policy underpinned by transformational change in equitable distribution, life-cycle costing and waste minimisation.

## **2.9 Are there certain contexts for which this solution is particularly well suited, or, conversely, contexts for which it is not well-suited at all?**

With 90% of fishers globally involved in artisanal fishing and many vulnerable populations and marginalized groups engaging in fish farming to support food security and poverty alleviation, developing countries and countries with a high to very high dependence on blue food are well-suited for this solution. For example, while Europe produces a significant amount of blue foods, their dependence on aquatic food systems for jobs and nutrition is relatively low. Conversely, sub-Saharan Africa produces far less blue foods but has a very high dependence on aquatic food systems for jobs and nutrition – and these are being exported offshore. These contexts will be particularly amenable to incorporating blue foods into broader food-systems policy, and moving toward diverse production systems to support social outcomes in addition to economic ones.

There is an opportunity to promote reciprocal learning and sharing of knowledge to ensure that new solutions and technologies are implemented with consideration of the context. Including existing local knowledge and the factors required to ensure the approach will be appropriate and beneficial for local communities in the



long-term. Therefore, while the framework described is generic, solutions will be site specific and should focus on identifying local attributes for blue food production and products<sup>41</sup>.

### **2.10 Who are the key stakeholders to be further involved in the process of developing and refining the solution idea?**

The concept for this solution was developed by a group of specialists working around the world to motivate international efforts aimed at improving ocean health and sustainable development of the oceans, and represent a range of expertise. Their ongoing involvement would be well-supplemented by the involvement of other key stakeholders, such as Action Tracks 1 and 4, leaders/representatives of under-represented groups (e.g. small-scale actors, marginalised groups, Indigenous communities), and policy experts, particularly from member states. It is important to ensure that people are part of this solution and that it promotes broader integrated management and cooperation<sup>42</sup>.

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<sup>41</sup> For example, Bell, J.D., Ratner, B.D., Stobutzki, I. and Oliver, J. (2006) Addressing the coral reef crisis in developing countries. *Ocean & Coastal Management* 49, 976–985.

<sup>42</sup> Stephenson RL et al. (2019) A practical framework for implementing and evaluating integrated management of marine activities. *Ocean & Coastal Management* 177:127-138 doi:<https://doi.org/10.1016/j.ocecoaman.2019.04.008>



## 17. Delivering healthier diets and restoring degraded land through tree-based food production

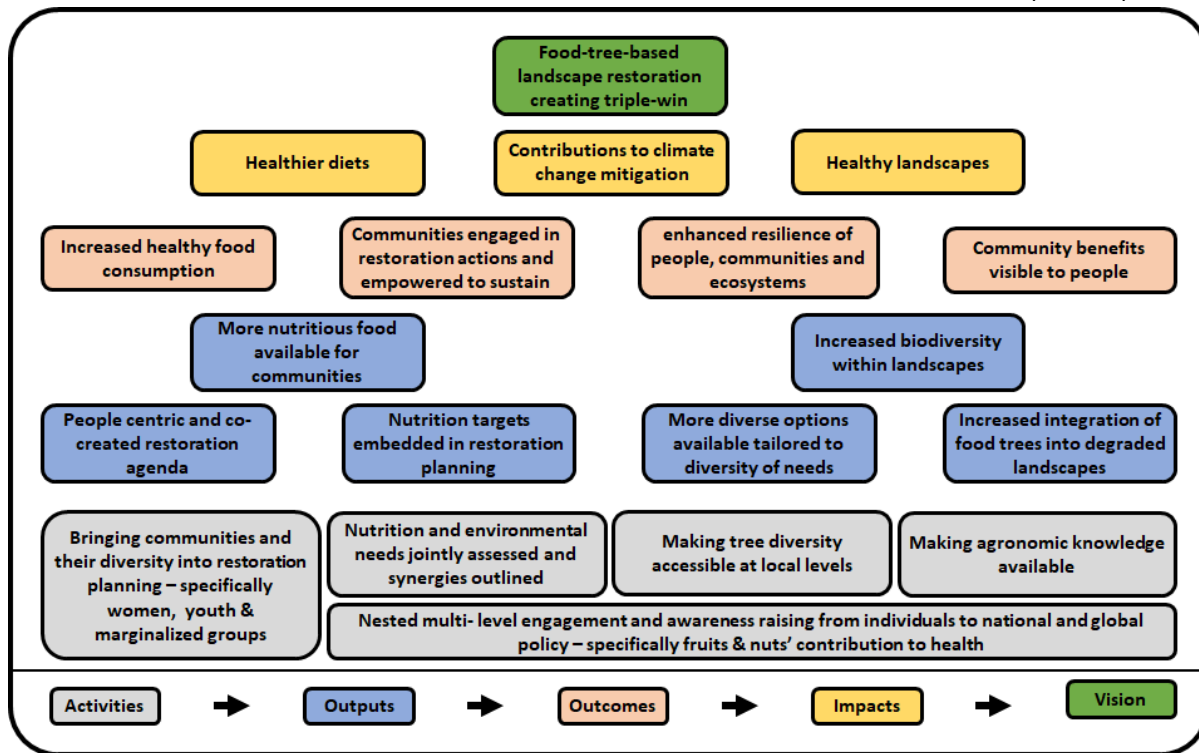
**2.1 What, in brief, is the solution?** Incorporating food trees with complementary crops into degraded landscapes to produce more nutrient-rich foods, restore degraded soils, and contribute to climate change mitigation.

**2.2 What was/were the source(s) from which this solution emerged?** This solution emerged from over a decade of consolidated research and engagement activities by World Agroforestry (ICRAF) and the Centre for International Forestry Research (CIFOR) scientists with a range of stakeholders from smallholder farmers to national governments across the Global South facing the challenges of food production and environmental degradation. Past research has highlighted the contributions and critical roles of trees within food systems for supporting availability and access to a greater diversity of nutritious foods.

**2.3 What problem is it trying to address within food systems?** The interconnectedness of the triple challenges of unhealthy diets, caused by both over- and under-nutrition, paired with losses of biodiversity and climate change. Tree based landscapes are ideally placed to serve these multiple purposes and support nutrition as well as livelihoods and well-being of the people that live in them.

**2.4 Why is addressing that problem important for achieving the goal of your ACAI?** Addressing the interconnectedness will advance the solutions as the distinct recognition will allow more holistic solutions and will avoid the common problem of trade-offs within the agri-food system - i.e. of fixing one problem while worsening the others.

**2.5 How can this solution address that problem?** Food tree-based landscape restoration will deliver the triple wins of healthier diets, healthier landscapes, and contribute to climate change mitigation. Supporting this process is a strong community based agenda setting that will allow people to engage and benefit directly from restoration and make it their own. The importance of fruit consumption for health is well known in the health and nutrition communities, but may be less appreciated by the general public. Awareness raising about the importance of consuming these nutrient-rich foods is required at all levels. We assume that once actors from national policy makers to individuals appreciate that consuming more fruits can decrease morbidity and mortality, there will be greater demand for fruits. We also assume that increased awareness about the benefits of trees for restoring soils and landscapes will incentivize people to plant more trees. Multi-level engagement will facilitate support mechanisms for nutrition sensitive restoration.



**2.6 Why does this solution align to the definition and criteria for a ‘game changing solution’ developed by the Summit?** Impact at scale: Over 20 million hectares of land have already been pledged for restoration; our solution would entail planting a portion of those hectares with food trees. The potential impacts could be enormous. IUCN has estimated that the potential benefits of restoration in general would bring \$84 billion per year in net benefits. Actionability: The IPES Food and supporting agencies are already committed to changing the food-system towards healthier diets. In addition, the agroecology movement has regained attention and support which would allow this holistic solution to fall on fertile ground and start from both these affiliated commitments. Sustainability: Solving the interconnectedness and avoiding slipping back on some targets while advancing the other targets will naturally create a cycle of progress which is self-enforcing and sustaining.

**2.7 What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?** Food trees have the potential to enhance the resilience of food systems through direct provision of culturally acceptable nutrient-rich foods ([Vinceti et al. 2013](#)) while contributing to the sequestration of carbon in the soil and to the general maintenance and functioning of healthy ecosystems and biodiversity ([Jansen et al. 2020](#); [Rosenstock et al. 2019](#); [Kuyah et al. 2016](#)). Tree foods present rich nutrient sources of micronutrients and can be used to complement and diversify staple-based diets, contributing to diets and health ([Jamnadass et al. 2015](#)). When proper attention is given to the seasonality of production, portfolios of tree foods that support key micronutrient needs can be promoted for food supply resilience ([Davies et al. 2021](#); [McMullin et al. 2019](#)). Promoting agroforestry for fruit production and soil health, amongst other innovations has been suggested as a key policy option for healthy diets and environmental sustainability ([Pedersen et al. 2020](#)).

**2.8 What is the current and/or likely political support for this idea?** Trees are part of the solution towards supporting the delivery of diverse and nutritious diets and embody core principles of sustainable food systems outlined by IPES Food such as diversity, multi-functionality and resilience, and align with agroecological approaches to food production. The Bonn Challenge subscribers would also likely support this solution to integrate productive restoration - focusing on food and landscape functionality for delivering more



nutritious food for achieving the global goal to restore 500 million hectares of degraded and deforested landscapes by 2030. In line with the CFS Voluntary Guidelines on Food Systems and Nutrition, this solution supports a number of guidelines including those specified on protecting, conserving and sustainably using biodiversity for food and agriculture to strengthen the resilience of food systems; supporting food producers in the production of diverse food that contributes to healthy diets, while ensuring a decent income, livelihoods and resilience, this makes specific mention of agroforestry, amongst others; and invest in knowledge transfer and innovation for producing diversified nutritious foods, such as fruits and vegetables, of which the majority of fruits are sourced from trees. The European Green Deal and its farm-to-fork strategy also indicate potential support from the EU.

**2.9 Are there certain contexts for which this solution is particularly well suited, or, conversely, contexts for which it is not well-suited at all?** This solution is suitable for delivering sustainable actions to respond to the food and nutrition challenges faced in many tropical countries, across multiple scales. The role of trees in delivering across multiple sustainability dimensions such as health, environment, socio-cultural, can be adapted and customized to different landscapes to ensure healthier diets are available, culturally acceptable to communities, while supporting biodiversity and ecosystem functions. This solution is not well suited to oceans but is relevant to coastal landscapes where mangroves support important environmental and livelihood functions, and where degradation of these systems undermine and impact on those not directly engaged. Extremely arid landscapes are not optimally suited, yet with initiatives such as the Great Green Wall - restoring and re-enforcing the Sahel with the ambition of 8,000Km of trees, offers an entry point for this solution. Such initiatives are already tackling the challenge of environmental degradation and the impacts on the livelihoods and well-being of the millions of people affected across this landscape.

**2.10 Who are the key stakeholders to be further involved in the process of developing and refining the solution idea?** The key is to have a mix of partners from various backgrounds across agriculture, forestry, nutrition and land use planning. This involves those who make decisions and who implement actions on the ground. The local contextualization will ultimately involve local communities that will co-develop and fine-tune the solution. In the frame of the UNFSS, there is the potential to synergize with the priority areas of Action Track 1 - Ensure access to safe and nutritious food for all.



## 18. Restoring grasslands, shrublands and savannahs through extensive livestock-based food systems

### 1. Background information on group and process

Grasslands, shrublands and savannahs cover extensive parts of the world and often contain significant biodiversity, however there is a lack of appreciation of their value. This can be partly attributed to the dearth of up-to-date data on grasslands and savannahs, their current distribution and status, and changes taking place; large areas of grasslands suffer from degradation. As a result there is a lack of attention given to protecting grasslands, shrublands and savannahs and investment in their restoration.

At the same time, there is a lack of appreciation of extensive livestock-based livelihood and food systems in terms of feeding local and national populations from land and in a climate that is often not suitable for growing crops. The opportunities for multiple use of the land such as sharing it with wildlife and providing environmental services such as maintaining or improving biodiversity, carbon storage and sequestration, and preventing duststorms are also often not recognised. Extensive livestock-based food systems are often 'bunched together' with *intensive* livestock systems in discussions about the negative impacts of livestock on the environment etc. This ignores the differences between the two and the environmental benefits of the former over the latter, as well as the fact that millions of people globally directly depend on extensive livestock compared to a more concentrated fewer number directly benefiting from intensive production.

### 2. Summary of each proposed solution

#### 2.1 What, in brief, is the solution?

The solution is: **Restoring grasslands, shrublands and savannahs through extensive livestock-based food systems.** This will include:

- The establishment of a multi-stakeholder platform on grasslands, shrublands and savannahs building on existing networks to raise awareness on their value, and advocate for their protection, sustainable use and restoration.
- The development of a global data platform on grasslands, shrublands and savannahs including consolidation of global data sets already existing and the collection of new data to improve these and create new ones. Facilities for monitoring including remote sensing of land changes and crowd-sourcing of data will be included. Restoration potentials of rangelands will also be identified.
- Development and documentation of good practices in the restoration of grasslands, shrublands and savannahs through extensive nature-positive livestock production/food systems. This can include silvo-pastoralism, carbon storage and sequestration, regenerative and planned/rotational grazing, re-wilding, ecological/wildlife corridors, removal of invasive species and rehabilitation of land, establishment of conservation areas, payments for environmental services, working with the current land users including pastoralists/livestock keepers.
- Awareness raising at global, national and local levels of the value of extensive livestock production/food systems and their role (actual and potential) in protecting and restoring grasslands, shrublands and savannahs including the inclusion of grassland, shrublands and savannahs in the new CBD targets and the declaration of an International Year of Rangelands and Pastoralists.
- Improving investments in restoration of grasslands, shrublands and savannahs including public, commercial and private finance. This includes improving the enabling environment for such investments to be made – improving understanding of benefits, reducing risks, supporting policy and legislation, secure resource and land tenure and good governance, etc.



## 2.2 What was/were the source(s) from which this solution emerged?

This solution was developed through a consultative process of different stakeholders facilitated by WWF's Grasslands and Savannah Platform.

## 2.3 What problem is it trying to address within food systems?

The solution will address the challenge of producing food from resource-poor areas unsuitable for crop farming, in a sustainable nature-positive way.

## 2.4 Why is addressing that problem important for achieving the goal of your ACAI?

Addressing this problem will help to optimize environmental resource use in production, reducing biodiversity loss, pollution, water use, soil degradation and greenhouse gas emissions.

## 2.5 How can this solution address that problem?

**Inputs:** In order for this solution to be realised it will require **a mass mobilisation of people (different stakeholders) and resources (skills, capacities, finance)**. **Up-to-date evidence-based data** will be required on grasslands, shrublands and savannahs including their current distribution, changes taking place, and restoration potential. **Development and documentation of good practices in restoration** of grasslands, shrublands and savannahs through extensive nature-positive livestock production/food systems will be needed for replication and upscaling (with adaptation and further development as appropriate). **Awareness raising will be needed on the benefits and potential of extensive livestock production/foods systems** and their role in protecting and restoring grasslands, shrublands and savannahs. **The enabling environment (policy, legislation, financial, de-risking, conflict-free) will require improvement.**

**Outputs:** With improved data on grasslands, shrublands and savannahs it will be possible to make **more informed decisions** about them including investments and particularly restoration investment opportunities. **Replication and upscaling of good practice initiatives** will be possible through the development and documentation of good practices. **Grasslands, shrublands and savannahs will be given greater attention in global strategies and frameworks**, such as CBD targets, and an International Year of Rangelands and Pastoralists will be declared. **Private investors will be more willing to invest in grasslands, shrublands and savannahs** once the enabling environment for such investments has been improved.

**Outcome:** **Investments in restoration of grasslands, shrublands and savannahs through extensive nature-positive livestock-based food systems will increase, and their sustainability improved.**

**Impact:** **Restored and more sustainable grasslands, shrublands and savannahs.**

## 2.6 Why does this solution align to the definition and criteria for a 'game changing solution' developed by the Summit?

This solution will strengthen actions already being taken to raise the profile and appreciation of grasslands, shrublands and savannahs, whilst shifting operational models and incentives towards increased investment in restoration of these. The solution has strong impact potential at scale, is feasible and actionable, and will be sustainable rooted with actors on the ground and others supporting them. The solution will have clear positive effects on the livelihoods of pastoralists (women and men) and others using these lands and resources. This action is complementary to other Action Track goals. The solution has potential to reach all grasslands, shrublands and savannahs globally and is sustainable.

## 2.7 What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?

We have already seen a mobilisation of people and resources towards the restoration of grasslands, shrublands and savannahs e.g. inclusion as an ecosystem in the UN Decade of Ecosystem Restoration,



the establishment of the WWF-lead Platform on Grasslands and Savannas, Global Agenda for Sustainable Livestock (GASL) and its Restoring Value to Grasslands action network and the call for an International Year of Rangelands and Pastoralists - this is a good start but much more needs to be done. There are good practices including from WWF ([here](#)), WOCAT ([here](#)), participatory rangeland management ([here](#)), a number of examples collated by GASL ([here](#)), forthcoming publication of work in the US ([here](#)), work of the Savory Institute of restoration in grasslands, shrublands and savannas through extensive nature-based livestock production/food systems. Evidence suggests that there is strong potential for significant scaling up of these. Increasing attention is being given to carbon storage and sequestration potential of grasslands, shrublands and savannas, as well as to improvements in the more polluting characteristics of livestock production systems. Investors are increasingly looking for new investment areas, and the risks of investing in grasslands, shrublands and savannas is being reduced with for example better drought monitoring, predictions and response and improved communication and infrastructure.

## **2.8 What is the current and/or likely political support for this idea?**

Nearly all member states are under pressure to reduce their carbon footprint including of extensive livestock-based systems. How to do this whilst also maintaining the millions of livelihoods that rely on these systems, whilst also continuing to produce food from these marginal, generally low-productivity areas, is a challenge for all. This solution of restoring grasslands, shrublands and savannas including their carbon storage and sequestering capacity will help to reduce such carbon footprints whilst also increasing nature, environmental and biodiversity benefits. It is strongly believed that all member states will support this. Examples are the Government of Mongolia leading the call for the International Year of Rangelands and Pastoralists (including written support from governments of Ethiopia, Australia, Afghanistan, Burkina Faso, Finland, Jordan, Kyrgyzstan, Tajikistan), the member states attending a recently held discussion on UNCCD targets organised by IUCN and WWF, and the Governments of Sudan, Namibia and Ethiopia who lead the UNEA Resolution on “Combating desertification and land degradation and ensuring the sustainable management of rangelands” (UNEP/EA2/L24).

Further there is significant support for this solution globally amongst multiple stakeholders expressed in the global support in for example, the International Year of Rangelands and Pastoralists (with over 50 international and local organisations supporting) and the UN Decade of Ecosystem Restoration, and more directly from the members of the WWF-led Grasslands and Savannas Platform.

## **2.9 Are there certain contexts for which this solution is particularly well suited, or, conversely, contexts for which it is not well-suited at all?**

This solution is specifically targeted to grasslands, shrublands and savannas, and more broadly to rangelands where extensive livestock livelihood/food systems are the norm.

## **2.10 Who are the key stakeholders to be further involved in the process of developing and refining the solution idea?**

It is anticipated that the member states mentioned above will be supportive and willing to contribute to the further development of this solution. It is proposed that the further development of this solution would be led by members of the WWF-led Grasslands and Savannas Platform, including the current focal person for this Solution being Fiona Flintan, Senior Scientist, ILRI (International Livestock Research Institute) and Ruairaidh Petre, Executive Director, GRSB (Global Roundtable for Sustainable Beef).



## 19. Enhanced restoration monitoring and data to guide investment

### 2.1 What, in brief, is the solution?

We propose an enhanced systematic monitoring system to track progress of restoration actions and outcomes. This solution is integral to achieving ambitious global restoration targets set by the Bonn Challenge, NYDF and other global restoration commitments, whilst tracking the contributions from ongoing country actions through the Rio conventions and other Multilateral environmental agreements. Access to improved and open data, innovative tools and technologies, new high resolution satellite imagery, and inclusive capacity development – all of which are contributions of the fourth industrial revolution [1] can be seen as innovative levers of change to help to validate and improve FLR actions. This solution will help to test underlying assumptions of restoration implementation and help to cultivate the badly needed business case to spur increased investments. An estimate puts the current finance gap to achieve biodiversity protection at between 598-824 billion [2]. This solution offer the potential to increase efficiency from current conservation expenditure, whilst promoting the tools needed for adaptive management and to help identify further opportunities for targeted financial investments.

### 2.2 What was/were the source(s) from which this solution emerged?

This solution has emerged from collaboration of many organizations involved with the Task force on Monitoring in support of the UN Decade on Ecosystem Restoration. The task force was launched in March of 2020 and brings together 219 technical experts from 82 organizations . Member affiliations extend to international organizations and all restoration stakeholders including NGOs, governmental agencies, academia and organizations implementing restoration initiatives across all ecosystems. Each member has an equal opportunity and responsibility to engage in the discussion ([Briefing note](#)).

### 2.3 What problem is it trying to address within food systems?

Restoring the productivity of degraded land areas can help address the triple challenge of our time; climate stability, food security and space for nature [3]. There has been steady momentum for FLR, with commitments by countries close to 1 billion hectares integrated into national plans in 2020 [4]. Restoration ambition is a real, yet tangible results have been lacking, and their remains a gap in reporting of concrete economic, ecological and social impacts. Compared to monitoring of deforestation events, FLR monitoring requires a more nuanced approach, higher resolution imagery, longer temporal scales, as well as blending human annotated data with remote sensing [5]. Practitioners and governments have further resource constraints and prioritize affordable cost effective indicators, and may have limited data availability, capacity, technical knowledge and political support. These barriers restrict conservation financing from Official Development Assistance (ODA), public sector and from for-profit endeavors which more commonly invest in other land uses that are more profitable in the short term but lead to massive destruction in the long term.

### 2.4 Why is addressing that problem important for achieving the goal of your ACAI?

Although we have witnessed an increase in global restoration commitments we still lack a strong evidence base to support further action and to attract large private sector investments required to move restoration the scale required. This solution aims to increase efficiency and application of existing restoration funds by tracking restoration through holistic monitoring system that moves beyond restoration actions to restoration outcomes, as well as to test the underlying assumptions of restoration interventions. Fundamentally the solution will aim to enhance country capacity and access to data, propose new solutions and tools and provide targeted capacity workshops and trainings to improve biodiversity outcomes, climate mitigation, food security and overall economic and social impacts.



## 2.5 How can this solution address that problem?

This solution proposes the development of a holistic monitoring system and geospatial platform to complement existing international, regional and national reporting processes under one common umbrella. Providing access to methodological guidance and tools to monitor and plan ecosystem restoration. The solution can also enable knowledge and technology transfer and to develop capacity of people, communities, rural institutions and countries to monitor and report their own restoration progress, supporting the creation of information by those who are undertaking restoration. Locally relevant information builds ownership and trust in restoration actions, enables participatory monitoring and the reporting of quality information on restoration progress. Further, the development of complementary restoration monitoring and planning tools will elucidate the benefits and costs of restoration to reduce the complexity that is comprised within restoration planning, and bolster private sector investments ([Holistic monitoring](#)).

## 2.6 Why does this solution align to the definition and criteria for a 'game changing solution' developed by the Summit?

Answered above

## 2.7 What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?

Progress on National Forest Monitoring Systems and REDD+ reporting (Forest Reference Levels and REDD+ technical annexes) has provided many lessons on catalyzing country progress on monitoring. For example, of 65 UN-REDD Programme countries, 46 have submitted one or more Forest Reference Level to the UNFCCC, representing a significant proportion of tropical forests. This represents a critical step forward in forest monitoring capacity that, in turn, contributes to monitoring efforts under the UN Decade on Ecosystem Restoration [6]. Further the Capacity Building for Increased transparency (CBIT- Forests), a GEF funded project, provides concrete evidence of the importance of strengthening national and institutional capacities on monitoring and compliance, which can lead to increased transparency around commitments and create a culture accountability for increased climate action [7]. To date FLR commitments are a relatively new phenomena and therefore restoration monitoring is a relatively new field. No single approach or tool can capture all the nuances of FLR, but the path forward will rely on combining data tools to create a composite approach [5].

## 2.8 What is the current and/or likely political support for this idea?

## 2.9 Are there certain contexts for which this solution is particularly well suited, or, conversely, contexts for which it is not well-suited at all?

This solution is well suited to terrestrial landscapes (grasslands, forests) where the collective strengths of the restoration monitoring community currently lie, and are strongly building off existing efforts for monitoring deforestation and early warning systems. It is less well suited to the aquatic ecosystems where area based indicators, fish stock harvest and ecosystems health are harder to track and less effective through remote sensing and satellite monitoring.

## 2.10 Who are the key stakeholders to be further involved in the process of developing and refining the solution idea?

Development of holistic monitoring systems, partnerships and accompanying elements will support national ownership of data, will engage available resources and capacity existing within agencies, building on existing structures and monitoring systems. Further, it aims to develop capacity of people, communities, rural institutions and countries to monitor and report their own restoration progress, supporting the creation of



information by those who are undertaking restoration. Key stakeholders include academia, governments, national agencies, NGOs, CSOs, and private sector investors.

### 2.11 Other remarks/comments to be reflected in AT3's report out on 'game changing' solutions

This solution is highly complementary with others solutions proposed on Landscape partnerships and Integrated landscape finance.

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1. Schwab, K. The Fourth Industrial Revolution: what it means, how to respond Available online: <https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>.
  2. The Nature Conservancy Financing Nature Conservation. **2015**.
  3. Baldwin-Cantello, W. The triple challenge of our time: a stable climate, food security and space for nature Available online: <https://medium.com/wwftogetherpossible/the-triple-challenge-of-our-time-a-stable-climate-food-security-and-space-for-nature-ba18a592763c>.
  4. Sewell, A.; Esch, S. Van Der; Lowenhardt, H. Goals and Commitments for the Restoration Decade. *Pbl* **2020**.
  5. Reyta, K.; Stolle, F.; Buckingham, K.; Landsberg, F.; Zamora Cristales, R.; Brandt, J.; Singh, R.; Streck, C.; Saint-Laurent, C.; Tucker, Compton J. Walji, K.; et al. A deep dive into biophysical monitoring and the road ahead. *Unasylva* **2020**.
  6. Walji, K.; Aga, Y.; Nuutinen, M.; Milliken, K.; Fox, J. Building a holistic monitoring framework for ecosystem restoration Available online: <http://www.fao.org/redd/news/detail/en/c/1293753/>.
  7. Condor, R. GLOBAL CBIT-FOREST PROJECT WILL STRENGTHEN COUNTRIES' CAPACITIES FOR TRANSPARENCY IN THE FOREST SECTOR Available online: <https://www.cbitplatform.org/articles/perspectives/global-cbit-forest-project-will-strengthen-countries-capacities-transparency>.



## 20. Shifting the way stakeholders engage with evidence to enhance food system decision making

### 2.1 What, in brief, is the solution?

The Stakeholder Approach to Risk Informed and Evidence Based Decision Making (SHARED), provides a structured stakeholder engagement process that fosters interaction between people and multi-thematic evidence. The process cultivates an understanding of systems, greater inter-sectoral and multi-stakeholder collaboration and decisions and direct actions that overcome siloed and adhoc approaches and integrate economic, social and ecological dimensions. Enhancing stakeholder engagement, through behavioural science and targetted engagement approaches, can 'nudge' towards effective collaboration, design and implementation grounded in evidence.

### 2.2 What was/were the source(s) from which this solution emerged?

This solution has emerged from collaboration between the World Agroforestry SHARED Hub and systems scientists collaborating in a demand driven process over the past 8 years. The SHARED approach and tailored set of tools and methods have been implemented in multiple contexts with national and sub-national governments, UN Agencies (UNDP, UNICEF, UNFAO), International NGOs and civil society actors focused on resilient outcomes through collaboration and integrated development planning [1].

### 2.3 What problem is it trying to address within food systems?

Food systems approaches demonstrate that the objectives of food, nutrition, agriculture and natural resources are intrinsically interrelated and linked to the diverse stakeholders and institutions that support and benefit from the system. While few would argue that these inter-relationships exist in principle, the deeper systems understanding of, for example, how soil health, functioning water cycles, and biological diversity underpin sustainable value chains, nutrition quality, market access and diversified livelihoods remains inadequate. This has resulted in continued siloed approaches and ineffective collaboration that undermines solutions that support food systems.

Additionally, while multiple forms of data and information exist that can link broadly under the umbrella of a food system, too rarely are they brought together in an accessible formats and within engagement processes where they can be interrogated, interpreted and applied to decision making contexts across scales. SHARED processes therefore get at the root of information, process, engagement and relationship gaps within a food system context, importantly establishing participatory buy-in for robust evidence, monitoring and how to apply actionable evidence.

### 2.4 Why is addressing that problem important for achieving the goal of your ACAI?

With approximately 2 billion hectares of degraded land globally and commitments to restore hundreds of millions of hectares of degraded land through the Bonn Challenge, the need and ambition for restoration can not be underestimated. If evidence from multiple sources can be brought together in accessible forms and to a range of stakeholders with a systems perspective, better decisions can be made in terms of targeting and matching restoration practices to different places, implementation, monitoring and reflection for adaptive learning. Stakeholder inclusion, structured engagement and actionable evidence are critical components of successful restoration.

### 2.5 How can this solution address that problem?

This solution will help bring together stakeholders at multiple scales to reflect on the evidence arising from multiple sources to look at a system and make better decisions on how restoration takes place. By implementing a structured behaviour change approach across a spectrum of restoration stakeholders this solution aims to create sustained and scalable capacity and rationale for implementation.



### **Example of Sub-national Resilience Planning in Kenya**

Three devolved county governments in Kenya (Laikipia, Turkana and Makueni) invited the SHARED Hub to support integrated development planning with an emphasis on resilience, food systems, and landscape restoration that align with national priorities (Kenya 2030), continental priorities (Africa 2063) and global Sustainable Development Goals. Relevant ministries, NGOS, civil society actors, UN agencies and community members, were engaged in structured and inclusive strategic planning processes that a) introduced evidence-based decision making and the role of evidence in setting priorities to address root causes of development challenges; b) created an evidence culture, bridging sectoral evidence sources (land health, production and trade, nutrition, education, health, water, etc.) and implications; c) used human centre approaches to interact with socio-ecological evidence and co-design and build a multi-theme evidence base (decision dashboards); d) enhanced skills for interpreting different data and its management; e) used community prioritization processes as a key source of evidence.

These in-depth evidence engagement processes opened the door to change governance policy and planning processes and how investments are prioritised and committed. Turkana County used the SHARED methodology and a tailored set of structured approaches to run their design process for the five-year Integrated Development Plan [2,3]. In Laikipia County, through the SHARED engagement process, evidence was used to understand and track food systems elements (food production, nutrition, local and regional trade, and land health) for planning purposes across multiple ministries resulting in a novel interactive decision support system to visualise and interograte food flows in the County [4]. In Makueni County, through the SHARED co-design process, dedicated county data and statistical officers, were adaptively trained to lead the process of evidence collection and guiding interpretation needs to co-produce a Makueni decision dashboard and resource hub for the County as a dedicated user designed restoration planning and implementation tool [5].

In each case, ensuring sustainability is a key criteria of the SHARED approach, with stakeholders in a contextual setting identifies early on, to be trained and lead on engagement processes and interpretation and value of evidence. This ensures scaling, via peer learning and nudge incentives, to a wide range of decision making processes and could be actioned and lead by the county governments after initial capacity building and training processes.

### **Scaling national and regional restoration and livelihoods**

Funded by the European Union, Regreening Africa is an ambitious five-year project that seeks to reverse land degradation, enhance food security and positively influence 500,000 households, across one million hectares in eight countries by incorporating trees into agricultural and pastoral landscapes. The project uses the SHARED approach for joint reflection and learning missions (JRLMs) to create an innovative and inclusive monitoring, reflection and learning approach for Non-Governmental Organisations (NGOs), World Agroforestry scientists, government and other partners engaged in oversight at the national level to interact with real time evidence for action planning on scaling restoration efforts [6]. Stakeholders engage with communities for experiential insights followed by interaction with multi-thematic and visually accessible “evidence walls” (household data, land health data, value chain data, nursery and tree nursery and tree planting data) to adapt annual scaling strategies and implementation plans (actionability and impact). More recently, local stakeholders have been interacting with and inputting data to a Regreening App used on mobile phones. Stakeholders engaging with evidence links science, implementation and governance. The use of JRLMs are being scaled to multiple other projects, can be adapted to different situations and can be implemented by other partners (sustainability) once capacity is built.

## **2.6 Why does this solution align to the definition and criteria for a ‘game changing solution’ developed by the Summit?**

Answered under 2.5



## **2.7 What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?**

See references at end of document - linked to section 2.5

## **2.8 What is the current and/or likely political support for this idea?**

Different national and sub-national ministries (e.g. Agriculture, Environment) have been engaged in this approach in Kenya, Rwanda Ethiopia, Niger, Senegal, Ghana, Mali, Sri Lanka, India and with International NGOs in these countries (World Vision, Care, Catholic Relief Services, Oxfam, Sahel Eco). In order to apply the SHARED approach, an initial needs assessment, analysis of stakeholder landscape and interactions and targetted relationship building allow for ensuring the most practical and sustainable political entry point. As a methodology that works across sectors, this means support often can be leveraged via political entities engaged in cross-sectoral planning or integration functions.

Support for this approach has been recorded from Turkana County in Kenya [7, 2] and the SHARED approach was used to develop the Agroforestry Strategy in Kenya in 2020. SHARED is now being applied to develop exemplar landscapes in Oromia, Ethiopia and Andra Pradesh, India.

## **2.9 Are there certain contexts for which this solution is particularly well suited, or, conversely, contexts for which it is not well-suited at all?**

The approach is practical at all scales and is particularly well suited in government and inter-governmental planning processes that are open to building inclusive, collaborative and evidence based processes for decision making.

## **2.10 Who are the key stakeholders to be further involved in the process of developing and refining the solution idea?**

Further development, refinement and methodical innovation of the SHARED process will take place with a range of partners including national and sub-national governments, CBOs, NGOs, research partners and platforms such as the ICRAF led Restoration TPP.

### **References:**

1. <https://www.worldagroforestry.org/shared>
2. Turkana County Government (2018) Turkana County Integrated Development Plan, 2018-2022. [https://turkana.go.ke/wp-content/uploads/2020/08/Final\\_Turkana\\_CIDP\\_Book\\_V7\\_22\\_12\\_2018-1.pdf](https://turkana.go.ke/wp-content/uploads/2020/08/Final_Turkana_CIDP_Book_V7_22_12_2018-1.pdf)
3. Vågen, T.-G., Winowiecki, L. A., Neely, C., Chesterman, S., and Bourne, M.: Spatial assessments of soil organic carbon for stakeholder decision-making – a case study from Kenya, SOIL, 4, 259-266, <https://doi.org/10.5194/soil-4-259-2018>, 2018.
4. Laikipia resilience Diagnostics Tool <http://landscapeportal.org/laikipiaRDT/>
5. Bourne, M., T.Vagen, L.A. Winowiecki, F. Musili, J. Mumina, C. Magaju, S. Chesterman. 2020. Summary of stakeholder and cross-sectoral engagement process with Makueni County Government and partners to co-design interaction with socio-ecological evidence for targeting land restoration investments. World Agroforestry. Nairobi. <https://www.worldagroforestry.org/output/summary-stakeholder-and-cross-sectoral-engagement-process-makueni-county-government-and>
6. Neely, C., Bourne, M., Chesterman, S., Chomba, S. (2019) Regreening Africa: Joint reflection and learning missions synthesis report. World Agroforestry (ICRAF), Nairobi. <https://regreeningafrica.org/wp-content/uploads/2019/10/JRLM-Synthesis-Report.pdf>



7. What makes an integrated development plan truly integrated? Blog  
<https://www.worldagroforestry.org/blog/2020/05/08/what-makes-integrated-development-plan-truly-integrated>



## 21. Strengthening Landscape Partnerships

### 2.1 What, in brief, is the solution?

We propose a global collaborative initiative to strengthen, and help form, new Landscape<sup>43</sup> Partnerships (LPs) that are enabled and empowered to lead coordinated transformation of their local food systems, including nature-positive production, access to safe and nutritious food for all; sustainable consumption patterns; equitable livelihoods; and resilience to climate change and other vulnerabilities, shocks and stress. Strong LPs will engage diverse partners; facilitate a shared understanding of their landscape; develop a landscape vision, action plans and investment portfolios that enable financing to flow at scale to locally owned landscape transformation. Governments and finance institutions can meet priorities and commitment by working with these LPs.

### 2.2 What was/were the source(s) from which this solution emerged?

This solution has emerged from the work of 100's of organized landscape partnerships around the world in which farmers, forest managers, fishers, local governments, businesses, social and environmental NGOs have joined together to devise and implement a shared vision for collaborative landscape regeneration. Innovations to strengthen such partnerships have been developed locally, as well as the fast-growing communities of practice around integrated landscape management and territorial development. The mechanism proposed for implementing this solution is the 1000 Landscapes for 1 Billion People initiative (1000L), an expanding coalition of partners launched in 2019 to enable multi-stakeholder Landscape Partnerships around the world to realize their collective visions for thriving landscapes through more effective tools, finance and connections ([www.landscapes.global](http://www.landscapes.global)).<sup>44</sup> To achieve scale, 1000L seeks to act as a transformation catalyst, through “radical” collaboration and advocacy for LPs with public and private initiatives/organizations to work through an integrated landscape management (ILM) approach. Many have already endorsed ILM, including: Global Landscape Forum, UN Decade for Ecosystem Restoration and Tropical Forest Alliance to name a few. The Global Environment Facility has a strong and growing portfolio of landscape programs, as do UNDP, UNEP, FAO, IFAD, UNESCO, WFP and World Bank. The growing movement for territorial development is highly aligned and a valuable source of solutions. Numerous networks of landscape partnerships have generated lessons and models for scaling.

### 2.3 What problem is it trying to address within food systems?

Transforming food systems requires a systemic and cost-effective approach to achieving food security in every place, with simultaneous and aligned actions for nature-positive agriculture; ecosystems that sustain nutrient-rich soils, access to clean water, and climate change resilience; biodiversity important for production and human health; and food markets and agribusiness; and rural livelihoods and rural-urban linkages. **However**, the current fragmentation of action in these domains--unaligned and at cross-purposes--and top-down policy, program and finance decision-making, undermine local visions and coordinated action for thriving landscapes. Stronger landscape-scale local governance and coordination are needed to link territorial development to local needs and human rights.

### 2.4 Why is addressing that problem important for achieving the goal of your ACAI?

Even with accelerating policy and investment to support sustainable food systems, nature-based climate solutions and adaptation, biodiversity conservation, rural renaissance, health and water security, business-as-usual implementation severely constrains success. Multiple project-based efforts work at cross purposes; the failure to cooperate strategically within a landscape or territory limits their ability to slow or stop

<sup>43</sup> We use the term ‘landscape’ here to refer to inter-connected place and people, at the scale where communities, agricultural production and ecosystems converge. Related terms include territories, jurisdictions, bioregions, watersheds, green growth corridors, and numerous others.

<sup>44</sup> List the 7 core partners and 25 technical partners?



processes contributing to degradation; short-term focus of investment makes it difficult to develop holistic-landscape-scale portfolios or attract the financing needed to achieve generational transformation. We need to strengthen local institutional foundations for long-term (generational), multi-sector collaborative planning and action, with aligned strategies for regenerative production and land use; natural habitats; and most sustainable settlements, infrastructure and industry.

## **2.5 How can this solution address that problem?**

LPs provide a facilitated platform that enables voices of all stakeholders, including farmers, women, youth and marginalized groups, to participate effectively in crafting and advancing a coherent landscape vision. They provide a mechanism for negotiation, joint problem-solving and building solidarity for long-term collaborative action. While each landscape or territory is unique, 1000 Landscapes for 1 Billion People has developed an adaptable framework and tools, and a strategy to strengthen LPs. This has four interrelated components: institutionalizing capacity support for integrated landscape management; Terraso--a digital platform to help LPs access data and operate more effectively; solutions for scaling finance for multi-sector portfolios of landscape investments; and networking LPs and their supporters. Components are being co-designed by LPs on the ground, and multi-organization Design Teams. 50 LPs will be actively using and refining these components by 2022. By 2030 these will benefit at least 1000 landscape partnerships through access to the Terraso platform; established learning networks and training institutes providing support; public, private and civic finance actors supporting pipelines of projects with suitable financial mechanisms; and through the 1000L partner network. Multi-dimensional impacts can be monitored through Terraso and the use of tools like LandScale. Success in this initiative depends on shared commitments to a 'radical collaboration' among many partners; a strong, lean and nimble facilitating 'hub'; investment in impact assessment, learning and knowledge-sharing; and political support for local leadership.

## **2.6 Why does this solution align to the definition and criteria for a 'game changing solution' developed by the Summit?**

1000L has been designed explicitly to catalyze food and related systems change to advance the Sustainable Development Goals, and establish the institutional foundation in multi-stakeholder landscape partnerships to sustain that change over time. The particular systems changes are: the empowerment of landscape partnerships to realize their own priorities for landscape regeneration; provisioning information technology that transforms LPs' be more efficient, effective and inclusive; to institutionalize centers of capacity building for integrated landscape management; and to shift financial flows to portfolios of synergistic landscape investments. The targeted support and development for LPs by 1000L follows an aligned framework for Integrated Landscape Management (ILM) which will integrate a Measurement, Evaluation and Learning (MEL) component which has core indicators (including human rights), as well as locally-adapted indicators through LandScale which are SMART. Depending on the LP, key indicators can include accountability provisions within LP governance which can serve the double function of supporting adaptive management and enabling external audits for trust.

## **2.7 What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?**

Between 2013 and 2016, surveys documented 428 examples of locally-driven, long-term Landscape Partnerships in South and Southeast Asia,[1] Latin America and the Caribbean,[2] sub-Saharan Africa[3] and Europe.[4] These partnerships had been operational for several years and involved stakeholders from different scales and sectors working toward multiple objectives for agriculture, environment and human well-being. LPs have arisen through grassroots movements<sup>[5]</sup> and are increasingly promoted by international NGOs, UN agencies and national governments in strategies for climate change mitigation and adaptation, land and forest restoration, food systems transformation, territorial development and green economy transition. Evidence shows that ILM can support climate change mitigation and carbon sequestration,<sup>[6],[7]</sup> sustain institutional processes for climate change adaptation<sup>[8]</sup> and resilience,<sup>[9]</sup> enhance livelihoods,<sup>[10]</sup> and



meet the SDGs in an integrated way.<sup>[11]</sup> Landscape approaches show strong potential to reconcile conservation and development by building social capital, enhancing community income and employment opportunities, as well as reducing land degradation and conserving natural resources.<sup>[12]</sup> A recent stocktaking of Territorial Development experience in 14 territories documented key factors driving success.<sup>[13]</sup> Each of the 1000L interventions is backed by research evidence or action research <sup>[14]</sup>, including evidence on the development of new landscape finance mechanisms and tools <sup>[15]</sup>.

## 2.8 What is the current and/or likely political support for this idea?

There is rapidly growing political support for strengthening landscape partnerships to achieve multiple goals for land and resources and associated economy. ODA from Governments of the Netherlands, Germany, UK and USA have been strong supporters. The Global Environment Facility, UNDP, FAO, World Bank have large and fast-growing portfolios of integrated landscape projects, and the Green Climate Fund, IFAD, Global Adaptation Fund and others are incorporating a landscape framework for investing. While concerns have been raised that top-down landscape programs could divert efforts to meet external interests, 1000L is squarely focused on supporting locally-driven LPs. 1000L has already attracted more than 30 international NGOs and financial organizations as partners; many others are supportive. Other stakeholders have expressed support, including the World Business Council for Sustainable Development, Global Agribusiness Alliance. Several CGIAR research institutions are leading research on effective ILM. The UN CBD, UNFCCC, CCD, the Bonn Challenge, and High-Level Political Forum of the SDGs have all formally endorsed landscape and/or territorial approaches. The Global Landscapes Forum and UN Decade for Ecosystem Restoration both have a strong integrated landscape approach. Many of the above have highlighted the urgent need for Landscape Partnerships to have more organized and systematic access to services specifically designed for their needs. [Add GAO, INNER, ALGOA?]

## 2.9 Are there certain contexts for which this solution is particularly well suited, or, conversely, contexts for which it is not well-suited at all?

Integrated landscape management can be adapted to diverse institutional contexts. But it is especially powerful in countries that have more decentralized decision-making, and where leaders are familiar with and supportive of participatory democratic processes. Where powerful stakeholders are located outside the landscape, LPs may need external allies to help ‘level the playing field.’

## 2.10 Who are the key stakeholders to be further involved in the process of developing and refining the solution idea?

LPs provide a platform that can be used to pursue solutions across all of the Action Tracks. So it will be important to mobilize inputs from across the Tracks, as well as from UN agencies (which can be mobilized by 1000L partner UNDP), companies and financial institutions, and especially from the existing LP learning networks. EcoAgriculture Partners, 1000L and FAO-North America will hold two international UNFSS Dialogues on Landscape strategies to transform food systems in March and June 2021, and IUCN is planning relevant Common Ground dialogues.

## 2.11 Other remarks/comments to be reflected in AT3’s report out on ‘game changing’ solutions

This solution is highly complementary with many other game-changing solutions, including integrated landscape finance and enhanced restoration monitoring and data to enhance investment, and scaling diverse production, conservation, consumption, nutrition and resilience solutions.

[1] Zanzanaini, C., Tran, B., Singh, C., Hart, A., Milder, J., & DeClerck, J. 2017. Integrated landscape management for agriculture, livelihoods, and ecosystem conservation: an assessment of experience from South and Southeast Asia. *Landscape and Urban Planning* 165: 11–21.

[2] Estrada-Carmona, N., Hart, A., Harvey, C., Fabrice, A., DeClerck, J., and Milder, J. 2014. Integrated landscape management for agriculture, rural livelihoods, and ecosystem conservation: An assessment of experience from Latin America and the Caribbean. *Landscape and Urban Planning*, Vol 129:1–11.

[3] Milder, J.C., A.K. Hart, P. Dobie, J. Minai, and C. Zaleski. 2014. Integrated landscape initiatives for African agriculture, development, and conservation: a regionwide assessment. *World Development* 54: 68–80.

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## 22. Soils Investment Hub

### 2.1 What, in brief, is the solution?

Our proposed approach is to create a critical mass of food and agriculture value chain companies and key stakeholders that drive alignment of investment decisions, mechanisms and capital towards scaling healthy soil agriculture practices.

### 2.2 What was/were the source(s) from which this solution emerged?

The inspiration for the solution was taken from the 2018 publication: [The Business Case for Investing in Soil Health](#). Furthermore, a session organized during the November UNFCCC Race to Zero event co-hosted by 4 per 1000 Initiative, World Farmers Organisation and WBCSD [Soil as a Climate Solution: Getting to Scale](#), coalesced a number of organizations around the topic. Most recently, a joint publication with the U.S. Farmers and Ranchers in Action (USFRA), [Transformative Investment in Climate-Smart Agriculture](#), highlighted the scope and scale of the opportunity in the United States. Gamechanger submissions from Bayer, Syngenta and the Baltic Group were also considered in putting this proposal together.

### 2.3 What problem is it trying to address within food systems?

The soil's stewards, farmers and ranchers face critical economic barriers to scale the adoption of healthy soil practices. Furthermore, the food and agriculture corporate boardrooms have not adopted a commitment to investing into this critical asset and a standardized investment assessment framework for soil health to align promising financial mechanisms to support farmers and ranchers to adopt healthy soil practices. Against this background, WBCSD's Soils Investment Hub (SIH) aims to convene and facilitate a coalition of companies and key soil stakeholders to set investment commitments and develop a method, tools and guidance for food and agriculture companies to align their investments to accelerate and scale healthy soil agriculture practices.

### 2.4 Why is addressing that problem important for achieving the goal of your ACAI?

Reduce biodiversity loss, improve carbon sequestration, enhancing food security

### 2.5 How can this solution address that problem?

WBCSD will bring together leading business CEOs from across the food system to commit to soil health investment. This will drive the scaling and development of investment mechanisms to economically support farmers transition to healthy soil practices will scale the hectares of healthy soils across global supply chains.

Our proposed approach will create a critical mass of food and agriculture value chain companies and key stakeholders that drive alignment of investment decisions towards supporting healthy soil agriculture practices through a series of building blocks to include:

- **Restoration Roadshow:** Convene 20 CEOs across the agriculture value chain to advocate and commit to (A) soils investment at scale, and (B) integrate soils assets thinking into corporate investment processes. Relevant academics and experts will be involved to support in this process.
- **Creation of Framework Guidance & Tools:** Develop guide and tools with key stakeholders that 1) standardize the classifications of soil as a value-chain asset 2) quantify and demonstrate the private and public benefits of investing into soil health practices fully accounting for the value being produced across agriculture sub-sector-, region- and stakeholder specific considerations and 3) provide a portfolio of soil investment mechanisms that can be prioritized to scale healthy soil solutions. As a result, the guide and tools should be able to serve various purposes such as financing decisions, disclosure statements, and various stakeholder engagement.
- **Soil Health Advisory:** A group of critical stakeholders including farm associations/farmers, civil society and key companies commit to share advice and knowledge that helps companies navigate



the complex landscape of technical standards relating to soil solutions and other accounting needs to develop demand for soil health investments. Key pieces of knowledge focus can include standards for generating soil carbon credits, credit accounting and monetising carbon value streams.

## **2.6 Why does this solution align to the definition and criteria for a ‘game changing solution’ developed by the Summit?**

This solution will focus on providing farmers equitable livelihood opportunities and regenerating environmental integrity. Identifying soil health as a critical asset for food and agriculture supply chain investment is a dramatic shift in the context of food and agriculture company boardroom investment making decisions. With soil health determined as a critical asset within food and agriculture executive offices there will be an alignment among investors, financial markets and other key stakeholders to address the needed scaling of investment to systemically shift the economic incentives for farmers and other soil stewards to adopt healthy soil practices.

- Pathway 1 – food and agriculture private sector CEO commitments to soil health leads to a market demand signal for mechanisms to invest into healthy soils practices
- Pathway 2 – food and agriculture private sector collaborate with farmers and producers to determine the methods to align economic incentives and support mechanisms for healthy soil practices
- Pathway 3 – Historical soil health supply chain investments provide empirical and quantitative data to support soil health investment framework for positive return on investments further providing momentum to systemic shift to soil health investments
- Pathway 4 – soil health science institutions and organisations provide the guidance to the investment decisions and mechanisms to instill best practices for measuring, reporting and validating soil health indicators.

## **2.7 What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?**

The science is clear: soil health is the foundation of our food system. Given the material impacts of climate change, soil degradation and the short time window of opportunity to prevent the disastrous scenarios unfolding, the food and agriculture private sector must commit and scale investment in restoring their most critical, underlying asset: healthy soils.

CEO commitments are powerful tools to bind an organization to a future course of action. Empirical evidence shows that private sector C-suite commitments can drive transformational changes across their value chain. Investors, customers, and employees would likely shun any company whose management refused to commit publicly to a strategy and back its intentions with investments. This is illustrated by the increase in private sector commitments to GHG emission reduction science based targets and the following investment mechanisms (e.g. green bonds, ESG funds, certifications, ect.) and investment capital increase dedicated to decarbonization activities.

## **2.8 What is the current and/or likely political support for this idea?**

There is a need to align soil health investments and government policies related to agriculture, climate and equity. There are indications that governments such as the United States, Australia, New Zealand and also the European Union will prioritize soil health.

## **2.9 Are there certain contexts for which this solution is particularly well suited, or, conversely, contexts for which it is not well-suited at all?**

Landscape: grasslands, rangelands, crop farmland, among others



Development level: low to high-income countries within food and ag supply chains with access to finance mechanisms

Key food system indicators: countries with soil degradation

## **2.10 Who are the key stakeholders to be further involved in the process of developing and refining the solution idea?**

Member states: All members states with significant agriculture supply chains and soil degradation

Non Governmental Organizations: soil health organizations, farmer organizations, agriculture finance orgs

Companies: global food and agriculture companies

IFIs: identifying donors to match current funding for the development of the tools and guidance delivery align and develop market-based mechanisms that increase investment

## **Any other remarks or comments you would like reflected in AT3's report out on 'game changing' solutions (optional)**

### **Impact:**

- No. of people impacted: Potential: our capacity to feed 9.8 billion people in 2050 depends on healthy soils.
- No. of hectares impacted: Potential: more than 40% of the Earth's land surfaces under soil degradation that need investments into healthy soil practices.
- Units of emission cut: Potential: 1.2 billion tonnes of carbon could be stored every year in agriculture soils (cropland and grassland), representing annual storage of 4 per 1000 compared to the surface soil horizon (IPCC, 2014)
- Quantitative improvements in ecosystem services: Potential: 1.2 billion US dollars is the economic loss in grain production due to soil degradation (FAO, 2006)

**Stage of Development:** Design phase



## 23. Building global initiative to address soil health and carbon sequestration

Sustainable management of soil health through sequestration and buildup of soil organic carbon content through adoption of regenerative agriculture and rewarding farmers and land managers by payments for ecosystem services, carbon farming and trading carbon credits.

### Summary

The solution is to restore soil health, promote adoption of regenerative agriculture, establish a mechanism to incentivize farmers by payments for ecosystem services, build a financeable market for rebuilding soil function and improving livelihoods of farmers through an equitable carbon financing.

Agricultural soils have a large potential to sequester carbon (organic and inorganic), contributing to climate change mitigation, adaptation, resilience, as well as improved livelihoods. Restoring soil function requires a widespread adoption of regenerative agricultural practices (e.g., conservation agriculture based on mulch farming and cover cropping in conjunction with complex rotations and integrated nutrient management, agroforestry and integration of crops and livestock with trees, improved varieties) which create a positive soil/terrestrial carbon budget, strengthen coupled recycling of water with carbon and nitrogen along with other elements, and restore degraded soils and ecosystems for producing more from less, and returning some land and water etc. to nature.

### What is the problem we are trying to address and why is it important?

Several obstacles to equitable carbon financing exist. Important among these are:

- 1) Lack of a method of certification based on rate of change in soil carbon stock (Mg C/ha. y.) to a specific depth through adoption of recommended management practices
- 2) No mechanism to compensate farmers for strengthening of specific ecosystem services (e.g., carbon sequestration)
- 3) Absence of a functional market for trading of carbon credits, using just and transparent method of payment based on fair price, and absence of long-term commitment to a functional market
- 4) Lack of financing for procurement of essential inputs needed by farmers for adoption of the regenerative practices

### Theory of Change

Re-carbonization of degraded and depleted soils through sequestration and buildup of soil organic carbon to attain a critical level in the rootzone of 1.5 to 2.5% would restore soil health, increase use efficiency of inputs, improve and sustain productivity, and adapt and mitigate the anthropogenic climate change. The strategy is to reconcile the need to enhance and sustain food production for the growing and increasingly affluent world population with the necessity to improve the environment.

### How does it align to the criteria

- (4) impact potential at scale<sup>45</sup> (including return on investment): Restoration of soil health is critical to attaining several Sustainable Development Goals of the United Nations including #2 (Zero Hunger), #13 (Climate Action) and #15 (Life on Land).
- (5) actionability (taking into account politics, capacity, costs): The cost of no action on restoring soil health at global scale is much greater than that of a judicious action. However, the lack of political will power to translating science into action is a major obstacle. There is also a need to strengthen human resources to effectively implement the program at local level.

<sup>45</sup> Does not necessarily imply a single large intervention as opposed to enabling multiple small actions



- (6) Synergism : restoration of soil health and carbon sequestration creates numerous co-benefits such as adaptation and mitigation of climate change, increase in water quality and renewability, improvement in above and belowground biodiversity, and creating nutrition-sensitive agriculture that alleviates malnutrition.
- (7) Sustainability (i.e., the ability to keep delivering to 2030 and beyond) : Restoration of soil health through sequestration of soil carbon is critical achieving sustainability and keeping the Agenda 2030 on the track. Because the importance of soil health is not specifically mentioned in any of the seventeen SDGs ,such lack of awareness of the precious and finite resource is hindering the progress in many goals including #3 ( Good Health and Well -Being, #5 (Gender Equality),#6( Clean Water and Sanitation),#10( Reduce Inequalities),and #16 ( Peace ,Justice and Strong Institutions)

**What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?**

Numerous long-term studies throughout the world ( developing and developed nations) have indicated that adoption of regenerative agriculture ( e.g., conservation agriculture, agroforestry )restores soil health, sequesters atmospheric carbon dioxide as soil humus, increases and sustains productivity, and makes agriculture a solution to restoring the environment. Obstacles to a widespread adoption of regenerative agriculture can be alleviated through payments to farmers for ecosystem services, development of carbon market, and education for enhancing awareness about the importance of these options. Regenerative agriculture is also critical to producing more from less, and saving some land and water for nature.

**What is the current and/or likely political support for this idea?**

There is a growing awareness among policy makers about the importance of soil carbon sequestration through adoption of regenerative agriculture .Notable examples among these are the“ 4per 1000 “ initiative adopted at COP21 in 2015 in Paris, Adapting African Agriculture at COP 22 in Marrakech in 2016, Platform on Climate Action in Latin America at COP 25 in Madrid/Santiago in 2019, and Living Soil in Latin America in 2020 by IICA in San Jose, Costa Rica. Similar initiatives are being adopted by development organizations ( e.g., FAO, World Bank, UNDP )

**Are there certain contexts for which this solution is particularly well suited, or, conversely, contexts for which it is not well-suited at all?**

The concept of regenerative agriculture ,for sequestration of carbon as soil humus and restoration of soil health, is scale neutral and applicable to large and small scale farmers, climate neutral and applicable in both warm and temperate climates. It is specifically suited to Harsh climate conditions ,and with long-term adoption, can lead to implementation of the concept of land degradation neutrality.

**Who are the key stakeholders to be further involved in the process of developing and refining the solution idea?**

Key stake holders are national institutions and international development organizations. Important among the national institutions are agricultural research institutions and universities . Also Important are professional societies at national and international levels. Some international organizations include FAO,UNEP, WMO, CGIAR,

We would like to reach out to key stakeholders including:

- <http://www.fao.org/global-soil-partnership/en/>
- <https://africasoilhealth.cabi.org/>



- <https://www.soilhealthpartnership.org/>
- <https://kisstheground.com/>



## 24. Indigenous peoples' food systems: conservation and biocentric restoration

### 3. Background information on group and process

Indigenous peoples' food systems are under increasing pressure. Internally, these stem primarily from the decline in traditional indigenous social and landscape management systems, the cultivation of unsustainable high value crops, unsustainable forestry and fishing practices, deforestation, and over-exploitation of biodiversity. External pressures include encroachment into indigenous peoples' territories and subsequent agricultural expansion, large and small-scale dam and mining projects and other infrastructure development, as well as deforestation, and illegal hunting and fishing. These pressures have significant negative consequences for traditional management systems, sharing of indigenous peoples' knowledge, and the sharing of benefits that come from conservation and management of key ecosystems. Furthermore, they have resulted in increased loss of biodiversity and vulnerability of indigenous peoples and their food systems to climate change, also leading to food and water insecurity.

The sustainability of the indigenous peoples' food systems is achieved through territorial management practices that have been developed over centuries. Whenever one of the elements is out of balance, the food system starts to deteriorate, its capacity to generate food diminishes and the natural resource base starts to be depleted.

#### 2.1 What, in brief, is the solution?

Indigenous peoples' territories cover 28% of the world's land surface and harbour 80% of the planet's biodiversity. These territories intersect with 40% of all terrestrial protected areas, water ecosystems and ecologically intact landscapes where indigenous peoples have developed complex indigenous food systems. These food systems are rooted in traditional knowledge and rely on territorial management practices, developed over centuries, to generate food while protecting the environment. More broadly, indigenous peoples' food systems are based in their cosmogony or way of seeing and interacting with the world of which they are a part of<sup>46</sup>. This is characterized by a biocentric approach that holds that all life deserves equal consideration and therefore has rights of existence and standing.

The game changing solution is an inclusive model of conservation based on indigenous peoples' knowledge and food systems. Through the Indigenous Peoples' Conservation and Biocentric Restoration approach, indigenous peoples will restore and conserve their territories by applying an adequate blending of new technologies with ancestral knowledge and practices that have allowed them to sustainably use and conserve their territories. Considering that around 60 million indigenous people rely on various forest ecosystems, which are part of their food systems and are also highly susceptible to climate change, this solution prioritizes those ecosystems. This solution will be led by indigenous peoples themselves, with support from key actors, and it will be rooted traditional food and territorial management systems. It will:

<sup>46</sup> As described by Catrin and Curihuinca (2014), in Indigenous Cosmovision, forests, grasslands, marine life, habitat, fish and biodiversity each have a symbolic meaning that defines the relationship of different peoples with land, territory, water, and other resources that constitute the physical, cultural and spiritual basis of their existence.

[https://www.cepal.org/sites/default/files/ponciano\\_catrin\\_v\\_vanessa\\_curihuinca.pdf](https://www.cepal.org/sites/default/files/ponciano_catrin_v_vanessa_curihuinca.pdf)



- Facilitate the transmission of traditional knowledge;
- Foster capacity development, especially of indigenous women to ensure their full involvement in decision making and conservation/ restoration activities;
- Secure Indigenous Peoples' collective and individual rights to access and use their traditional territories, natural resources and lands.

## 2.2 What was/were the source(s) from which this solution emerged?

During the International Expert Group Meeting on Conservation and the Rights of Indigenous Peoples (January 2019 Nairobi), indigenous leaders called on the international community to develop inclusive models of conservation that do not violate their rights. Indigenous peoples' custodianship of the environment and ecosystems, and their rights to land and natural resources are unrecognized.

Indigenous Peoples' face the negative impacts of conservation programmes, which have frequently been based on the concept of protecting biological resources and land and seascapes, while excluding human beings from these areas, violating the rights of indigenous peoples. This has led to forced displacement and evictions from their territories; criminalization and destruction of livelihoods; loss of rights to lands, waters and resources and sacred sites; violence and extrajudicial killings of environmental defenders.

To address these challenges, FAO's Indigenous Peoples Unit together with indigenous organizations and the FAO Forests and Water Programme and the FAO Agroforestry team, have developed the Indigenous Peoples Conservation and Biocentric Restoration approach.

## 2.3 What problem is it trying to address within food systems?

- Conservation and restoration of the ecosystems that support these food systems is central to increasing indigenous peoples' food systems resilience.
- Degradation of forest and water ecosystems that support Indigenous Food Systems.
- Loss of the traditional knowledge passed on through various generations as well as livelihoods.
- Vulnerability of Indigenous Food Systems and the ecosystems that support them due to climate change.
- Lack of recognition of the Indigenous Foods Systems approach as an effective landscape management approach that can contribute to ensuring food and water security of indigenous peoples and is key to climate change mitigation and adaptation.

## 2.4 Why is addressing that problem important for achieving the goal of your ACAI?

By addressing the problems stated above, we can reduce biodiversity loss, ensure the conservation of biodiversity hotspots, improve carbon sequestration, improve management of indigenous peoples' food systems and restore soil function, through an inclusive approach that respect indigenous peoples' rights.

## 2.5 How can this solution address that problem?

### INPUTS

- Indigenous biocentric conservation:** Conservation activities decided and carried out by indigenous peoples in their territories and adjacent areas with the support from various partners.
- Indigenous biocentric restoration:** restoration of indigenous food systems and activities chosen by indigenous peoples through their decision-making processes. Work with partners to ensure solutions reduce the vulnerability of indigenous communities to climate change and food and water insecurity.
- Capacity development:** Capacity development: 1) on indigenous biocentric restoration and conservation of indigenous food systems; 2) for all stakeholders to improve the enabling environment; 3) to support the engagement of indigenous peoples in different governance mechanisms and platforms.
- Knowledge management:** development of materials that can support evidence-based management and policies as well as knowledge sharing with other indigenous communities and the rest of the world.



## OUTPUTS

- i. **Areas under Indigenous peoples' conservation:** Areas of highly valued ecosystems conserved and under improved and inclusive management through an indigenous methodology.
- ii. **Areas, home to key ecosystems, restored:** Degraded areas in indigenous territories restored through holistic methodologies developed by indigenous peoples.
- iii. **Increased capacity of Indigenous Peoples and supporting institutions:** increased capacities of indigenous women, men and youth to implement conservation and restoration interventions.
- iv. **Increased knowledge:** increased knowledge of restoration and conservation of indigenous food systems and the impact this has on biodiversity, provision of ecosystem services and climate change adaptation. Increase exchange of knowledge within and outside indigenous communities.
- v. **Strengthened enabling environments:** local and national enabling environments strengthened through dialogue, capacity development of all involved actors, and evidence-based policies.
- vi. **Indigenous people engaged in local, national and global decision-making platforms:** indigenous communities actively engaged in local, national and global governance mechanisms and platforms with participation from youth, women and men.

**Major assumptions:** The process is led by and centred on indigenous peoples and will be based on the implementation of the Free Prior and Informed Consent processes (FPIC); Agencies, such as FAO will provide technical guidance and support to indigenous partners.

### 2.6 Why does this solution align to the definition and criteria for a 'game changing solution' developed by the Summit?

This game changing solution responds to a need for new models of conservation and sustainable food systems that can strengthen global efforts to conserve biodiversity, address food security and reduce carbon emissions. At the same time, it empowers indigenous peoples to effectively manage their territories in a way that preserves their traditional knowledge, socio-cultural systems, cosmogony and governance systems as well as the key ecological functions that support their livelihoods. Conservation and restoration actions within these food systems can be scaled up to cover large areas of the world.

### 2.7 What is the existing evidence supporting the argument that this solution will work, or at least that it will achieve the initial outcomes described above?

Since 2017, FAO, in partnership with numerous research and indigenous peoples' organizations, undertook the research of 8 unique indigenous peoples' food systems across the world. Among the main findings of this research (published in 2009, 2012 and 2021), the following points stand out:

- Indigenous peoples preserve and restore the ecosystems through their food systems.
- Indigenous food systems encompass many aspects of resilience as they are not only about food.
- Indigenous food systems can broaden the existing food base, and their foods are nutritious and diverse.

### 2.8 What is the current and/or likely political support for this idea?

**Global-Hub on Indigenous Peoples' Food Systems:** During the 27th session of COAG (2020), FAO Members endorsed the creation of a Global-Hub on Indigenous Peoples' Food Systems at FAO as a knowledge center that brings together indigenous experts and organizations, universities, research centers, UN agencies, and FAO experts. It aims to promote greater recognition of indigenous peoples' food systems and to close the gap between academic and indigenous peoples' knowledge,

**Group of Friends of Indigenous Peoples in Rome:** 24 FAO Member Countries constitute the Group of Friends. The Group has been key to ensure the recognition and inclusion of indigenous peoples, their rights, knowledge and food systems in relevant documents such as the recently endorsed CFS Voluntary



Guidelines on Food Systems and Nutrition, which call on “*strengthening participation and inclusion of indigenous peoples and local communities in food systems*”.

Beyond these efforts, Indigenous food systems and land management practices have been recognized in various processes of the environmental MEAs. For example, CBD COP decision CDB/COP/DEC/14/8.

**2.9 Are there certain contexts for which this solution is particularly well suited, or, conversely, contexts for which it is not well-suited at all?**

- Countries where the recognition of collective rights of indigenous peoples has made some progress and government policies and institutions are looking into working with indigenous peoples;
- Countries and indigenous communities with globally significant biodiversity and important water-related forest ecosystems that are facing existing threats;

**2.10 Who are the key stakeholders to be further involved in the process of developing and refining the solution idea?** Action Track 2,4,5 and ACAI 1 and 2 under AT 3. Indigenous peoples’ organizations and indigenous leaders participating in the UN Food Systems Summit



## Appendix 1: FIRST WAVE: Mapping of propositions received from Public Surveys against the 24 'game-changing solutions'

The solutions in the “first wave” were received by Action Track 3 by the end of January and shared with the ACAI Advisory Teams. The below table summarises this input and maps it against the 24 solutions outlined in this paper. Solutions from private sector organisations received via the public survey are included in Appendix 2.

<b>Propositions from Leadership Team</b>	<b>Associated propositions from public survey</b>		
	<i>Source</i>	<i>Organisation</i>	<i>Proposition</i>
1. A just transition to sustainable agriculture through policy reform and Public Support	Individual	Individual	Integrated Landscape/Seascape Management Scaling
<b>Lead organisation(s): Meridian Institute</b>			
2. Transforming commodity supply chains to benefit people and to protect and restore nature	NGO	WWF	An "Integrated Agribusiness-Conservation Model" to engaging smallholder farmers in ethical and sustainable food commodity supply chains
	NGO	WWF	Eliminate trade in food products derived from ecosystem conversion
	Research Institute	Finnish Environment Institute	Regulating the supply chains of companies involved in food manufacturing and retail.
<b>Lead organisation(s): FACT, TFA, WRI, FOLU</b>			
7. Adopting nature-positive livestock production systems	NGO	Health for Animals	Reduce disease incidence and improving the health of livestock through greater uptake of existing technologies such as vaccines and access to veterinarians, which can reduce resource use and lead to more nature-positive production.
	NGO	World Animal Protection	One Health, One Welfare
	Producers Association	Dairy Sustainability Framework	Wider implementation of the Dairy Sustainability Framework (DSF)
	Research Institute	SEBI Livestock	Better and more accessible livestock data (collection, handling, and presentation) for better decision making at all levels
<b>Lead organisation(s): World Farmers Organization (WFO)</b>			



8. Adopting regenerative agricultural practices for resilient landscapes at scale	NGO	WWF	Regenerative Natural Selection Integrated Agriculture
<b>Lead organisations(s):</b> <i>ICRAF-CIFOR, TNC, OP2B</i>			
9. Scaling-out Agroecological Production Systems	NGO	WWF	Resilient communities and ecosystems increased through agroecology leading to diversification of income, food security and habitat conservation in Southern Africa within the concept of One Health
<b>Lead organisations(s):</b> <i>Asian Farmers Organization, Biovision, IFOAM, CARI</i>	Research Institute	Centre for Science and Environment, New Delhi	Develop a support system (like ecological payment service) to support farmers for making a transition from chemical and input intensive model to nature positive production like agroecology.
11. Sustain and Expand Sustainable Resilient Blue Food Production Systems	UN Agency	UN Global Compact	Regenerate ocean abundance and better feed the world using the untapped potential of seaweed
<b>Lead organisations(s):</b> <i>Environmental Defence Fund, Stockholm Resilience Centre</i>			
12. Aligning policies with nature-positive production	Producers Association	Canadian Roundtable for Sustainable Beef	Multi-stakeholder collaborations can transform the food system for the benefit of both people and nature
<b>Lead organisations(s):</b> <i>FOLU, Biovision, IFOAM</i>			
13. Reducing on-farm and post-harvest food loss	NGO	WWF	Land-less feeding of livestock through repurposing of wasted food
<b>Lead organisation(s):</b> <i>IFPRI, UVM, WWF</i>	Research Institute	Indian Veterinary Research Institute	Fruit and vegetable waste for animal feeding
14. Broadening the genetic base of nature-positive production systems	Individual	Seed and Planting Material Development Centre, Department of Agriculture, Sri Lanka	Free sharing of Traditional Agricultural Plant Varieties
<b>Lead organisation(s):</b> <i>CIAT/Bioversity</i>			
	NGO	CIPAV	Silvopastoral systems



	NGO	WWF	Safeguarding flooded savannahs by sustainable cattle ranching
18. Restoring grasslands, shrublands and savannahs through extensive livestock-based food systems	Producers Association	Global Roundtable for Sustainable Beef	Nature positive grazing management on grasslands
<b>Lead organization(s): ILRI, Global Roundtable for Sustainable Beef</b>	Producers Association	League for Pastoral Peoples	Pastoralism
	Producers Association	US Roundtable for Sustainable Beef	Livestock Protecting One of the Last Remaining In-tact Grassland Biomes
	Research Institute	DITSL	Livestock corridors for improved pastoralist-farmer relations
	Research Institute	ILRI	Participatory Rangeland Management
21. Strengthening Landscape Partnerships	NGO	CARE-WWF	Participatory, integrated land and water use planning
<b>Lead organization(s): Ecoagriculture Partners</b>	NGO	WWF	Community Integration
23. Building global initiative to address soil health and carbon sequestration	NGO	WWF	Enhancing soil biodiversity and fertility
<b>Lead organization(s): ICRAF, Ohio State University</b>	Research Institute	FAW/n Research Institute of Applied Knowledge Processing	Implementation of a methodology and a standard to integrate soil carbon into the voluntary carbon markets
<b>Gaps in current solution set: Education</b>	Academic Institution	IPCYT	Implement education programs on sustainable food systems at all levels
	NGO	Global Network of Lighthouse Farms	Global outdoor classroom and laboratory
<b>Gaps in current solution set: Finance</b>	Individual	Middlebury College	Payments for ecosystem services
	NGO	Sight and Light	Food System Innovation Hubs
<b>Gaps in current solution set: Resource use efficiency</b>	Academic Institution	University of Yaounde	Food conservation methods



<b>Other gaps</b> in current solution set	Indigenous People's Organisation	Indigenous Livestock Society	Degrowth in food-processing for local consumption
	Individual	Blogger	100% plant based diet
	Individual	Student	Geoparks and Eco-Parks
	NGO	Nutrition for All	True Cost Option to Pay
	NGO	UN FSS 21 Champion	Reduce water usage in food production
	NGO	WWF	Considering the impact of human wildlife conflicts on sustainable food production and local communities, and make sure this is managed well.
	NGO	WWF	Create food systems that connect nature
	NGO	WWF	Women in urban food systems/ urban gardening
	NGO	WWF	Participatory Guarantee Systems - Local-specific certification schemes for organic agriculture



## Appendix 2: FIRST-WAVE: Mapping of propositions received from Member States, UN Agencies and Private Sector against the 24 ‘game-changing solutions’

In parallel to developing game-changing solutions within the ACAI teams, Action Track 3 has also received input from many Member States, UN agencies and private sector organisations. The below table represents an initial effort to both map these solutions against those outlined in this paper. We will refine this initial effort in conjunction with the stakeholders who have suggested solutions as well as continuing to review further input as it received.

Propositions from Leadership Team	Associated propositions from Member States, UN Agencies and private sector			
	Source	Organisation/ Member State	Proposition	
2. Transforming commodity supply chains to benefit people and to protect and restore nature	Member State	France	Alliance for the Conservation of Rainforests, and Sustainable Value Chains	
			Reducing (imported) deforestation and forest degradation	
		European Commission	Promoting sustainable and deforestation-free agricultural supply chains in order to halt and reverse deforestation	
	Private Sector	Nestle	Deforestation-free supply chains	
6. Transforming agricultural innovation for climate, nature and people	Member State	Australia	Fisheries Electronic Monitoring Program	
			Chameleon Soil Water Sensor	
			The Happy Seeder	
			Ag Results Initiative	
		European Commission	Reduction of Pesticides Use	
	Private Sector	Japan	Promote risk assessment based on the latest scientific knowledge regarding the registration and use of pesticides, and harmonize the risk-based evaluation method (s) internationally	
			OCP North America	A consolidated program for small-holder farmers to make evidence-based nutrient management decisions (Al Moutmir, Morocco)
			WEF	100 million Farmers-1 Billion Consumers (decarbonizing food systems)
		UN	AgriSafe Technologies	AgriSafe: Biocontrolling crop diseases whilst minimising the use of chemical pesticides
	UNCCD		Precision Agriculture	
Integrated small-scale mariculture				



		UNDP	Targeted Scenario Analysis
7. Adopting nature-positive livestock production systems	Private Sector	Swissgenetics	Breeding for long living productive cattle, pasture-based
<b>Lead organisation(s):</b> <b>World Farmers Organization (WFO)</b>		Dairy Platform	integration of animal agriculture in converting marginal assets into high quality necessities of Human diets.
		GFLI	Global Feed LCA Institute (GFLI) - a publicly available feed LCA database based on FAO-LEAP methodology
		Alltech	Archbold Research Alliance - Buck Island Ranch, Florida
		Tyson Foods	sustainable beef initiatives
8. Adopting regenerative agricultural practices for resilient landscapes at scale	Private Sector	IMAGINE.one	A Common Code for Regenerative Agriculture
<b>Lead organisations(s):</b> <b>ICRAF-CIFOR, TNC, OP2B</b>			
9. Scaling-out Agroecological Production Systems	Member State	France	Promoting holistic and sustainable production systems and agroecological transitions
			Implementing CFS Policy in Agro-Ecological Practices and Other Innovative Approaches
			Scaling up the Great Green Wall Accelerator
	Private Sector	European Commission	Building capacity in agroecological research, extension, and education
		Japan	Promote organic farming according to regional characteristics.
		Interbev France	Agroecology, integrated vision of nature and agriculture
		UN	UNDP
10. Increasing agrobiodiversity for improved production and resilience	Member State	Australia	Management Procedures for Key Tuna Species in the Indian Ocean - Tuna Commission
		EmergingAg	Crop Rotations
	Private Sector	Haile Wako Integrated Farm	Climate smart seeds production and supply using IOT
		UN	UNCCD
<b>Lead organisation(s):</b> <b>Croptrust, CIAT/Bioveristy</b>			



11. Sustain and Expand Sustainable Resilient Blue Food Production Systems			
<i>Lead organisations(s):</i> <b>Environmental Defence Fund, Stockholm Resilience Centre</b>	Member State	European Commission	Provide Strategic Guidelines for EU Aquaculture
12. Aligning policies with nature-positive production	Member State	Japan	FAO and others will play a central role in deepening knowledge for improving food sustainability.
<i>Lead organisations(s):</i> <b>FOLU, Biovision, IFOAM</b>	UN	UN-Habitat	Strengthening urban-rural linkages
13. Reducing on-farm and post-harvest food loss	Member State	Japan	Each member state sets a goal to halve food loss by 2030
<i>Lead organisation(s):</i> <b>IFPRI, UVM, WWF</b>	Private Sector	NeverIdle Farms and Consulting	Harvest-tenure or mobile grain storage awards SSA growers the economies of scale that prevent post-harvest loss, sustain nutrient and foreign exchange reserves
15. US\$200M Climate Smart Food Systems Impact Investment Fund		U.S. National Pork Board	A carbon footprint calculator for farmers/ranchers/producers/growers
		WEF	100 million Farmers-1 Billion Consumers (decarbonizing food systems)
<i>Lead organisation(s):</i> <b>CIAT/Bioversity; CGIAR/CCAFS</b>	Private Sector	Solutions from the Land	Climate smart agriculture
		EmergingAg	Climate Smart Agriculture
19. Enhanced restoration monitoring and data to guide investment			
<i>Lead organisation(s):</i> <b>Ecoagriculture Partners, FAO, IUCN</b>	Private Sector	Rabobank	Biodiversity Monitor - Radobank
20. Shifting the way stakeholders engage with evidence to enhance food system decision making			
	Private Sector	Bayer AG	Creation of land-use footprint for specific produce
		Nutrien Ltd	End-to-End Carbon Program



**Lead organisation(s):**  
**ICRAF, FAO**

22. Soils Investment Hub	Private Sector	FungiAlert Ltd	Take advantage of soils microbiome to regenerate degraded systems, protect natural ecosystems and sustainably manage food production systems
		Rabobank	Banking for Carbon neutrality through developing carbon farming projects - Rabobank
23. Building global initiative to address soil health and carbon sequestration	Member State		National Soil Strategy
		Australia	Validating technologies to assess and monitor the re-wetting of peatlands using eddy flux towers, coupled with Cameleon sensors
			Emissions avoidance of soil carbon from lands undergoing practice change
		France	4 for 1,000 Initiative: Soils for Food Security and Climate
	Private Sector		Promote paludiculture on drained peat soil and produce growing media for peat replacement in horticulture
		Finland	Comprehensive "Catch the carbon" -programme in land use sector to reduce emissions and increase sinks and reservoirs and secure the sustainable food systems
<b>Gaps in current solution set: Education</b>	UN	WFP	Food Assistance for Assets
	Private Sector	EmergingAg	Soil Health and Carbon Sequestration
	Member State	Japan	Member state integration of environmental elements contributing to GHG reduction, etc. into the relevant guidance of each country and the curriculum in food education in order to systematically work on the promotion of sustainable food
<b>Gaps in current solution set: Finance</b>	Private Sector	Ranch Mgmt. YoYu	Sustainable Business Training YoYu service food production
		OCP North America	Mobile School Labs in Sub-Saharan Africa
	Member State	Japan	Change the flow of ESG investment toward sites of agriculture, forestry and fisheries and promote private investment in technologies leading to transformation on the ground and GHG reduction.
	Private Sector	Rabobank	Tool to enable financial institutions (or other investors, and to some extent individual farmers)

**Gaps in current solution set: Resource use efficiency**